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- Case studies
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Conclusion should elucidate how the results communicate to the theory presented as the basis of the study and provide a concise explanation of the allegation of the findings.

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## Antibiotic Resistance: An upcoming Pandemic

Prof. Dr. Riffat Mehboob<sup>†</sup>

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### ARTICLE INFO

#### How to Cite:

Mehboob, R. . (2022). Antibiotic Resistance: An upcoming Pandemic. *Pakistan Journal of Health Sciences*, 3(06). <https://doi.org/10.54393/pjhs.v3i06.379>

Antibiotics are medications that are used to both prevent and treat bacterial infections. Antibiotic resistance arises when bacteria adapt to the usage of antibiotics. Antibiotic resistance develops in bacteria rather than in humans or other animals. These germs can infect both humans and animals, and their infections are more difficult to treat than those caused by non-resistant bacteria. Antibiotic resistance causes greater mortality, longer hospital stays, and higher medical expenses. Our capacity to cure widespread infectious illnesses is being threatened by the emergence and worldwide dissemination of new resistance mechanisms. As antibiotics lose their potency, an increasing range of ailments, such as gonorrhoea, blood poisoning, pneumonia, and tuberculosis (TB), become difficult to treat and, in some cases, incurable. In every region of the globe, antibiotic resistance is increasing to dangerously high levels. It poses a serious danger to public health on a global scale, killing at least 1.27 million people and contributing to approximately 5 million deaths in 2019 [1]. More than 4.6 billion dollars a year is the projected cost to treat infections brought on by six multidrug-resistant pathogens that are often seen in healthcare settings. *Escherichia coli* is the pathogen that is most commonly reported in Pakistan (68.8% in 2018) [2, 3].

Antibiotic resistance jeopardizes advances in contemporary medicine. The main issues and concerns in Pakistan are a large number of surplus registered drugs (approximately 50,000), self-medication by more than 50% of the population, and a substantial number of quacks in the country. On average, each patient is given more than three drugs, and antibiotics are given to 70% of patients which is the highest number of prescriptions as compared to rest of the world. General practitioners (GPs) and public hospitals, which favor expensive broad-spectrum antibiotics, are more prone to prescribe these medications impulsively and without consideration [3]. Antibiotic abuse and misuse, as well as inefficient infection prevention and control, all contribute to the rapid spread of antibiotic resistance. Actions can be taken at all societal levels to mitigate the consequences and prevent resistance. Antibiotics should only be used as advised by a licensed healthcare provider. Doctors should only prescribe and give antibiotics when absolutely required, according to current recommendations. To address antibiotic resistance, the government must implement a comprehensive national action plan.

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## Psychological Disorders

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## ARTICLE INFO

**How to Cite:**Tariq, A. .(2022). Psychological Disorders. Pakistan Journal of Health Sciences, 3(06). <https://doi.org/10.54393/pjhs.v3i06.380>

Psychological disorder is referred to as a clinically significant disruption in a person's behavior, cognition and emotional control. It is often linked to distress or functional impairment in key areas of brain functioning. Depression, bipolar illness, schizophrenia, and eating disorders are just a few examples of psychological problems. Psychological problems may be connected to several other conditions, such as insomnia, psychosis, stress, and anxiety. Different people are affected differently by these disorders and their severity might vary. Anxiety and depressive disorders are the most prevalent psychological illnesses, affecting 1 in 8 persons, or 970 million people worldwide [1]. Due to the COVID-19 pandemic, the number of individuals who suffer from anxiety and depression illnesses have greatly increased in 2020. Initial projections indicate a 26% and 28% rise in major depressive disorder and anxiety disorders in only one year [2]. In Pakistan, psychological problems represent more than 4% of all disease burden, with women's mental health being greatly affected and neglected. According to estimates, 24 million Pakistanis need mental care and half of the population does not have access to the psychiatrists [3].

The likelihood of having psychiatric problems is influenced by a number of variables. Even while the majority of individuals are resilient, those who are exposed to unfavorable conditions, such as poverty, violence, handicap, and inequality, are more at risk. Individual psychological and biological characteristics, such as emotional skills and heredity may also increase risk of mental disorders. Changes in brain structure and/or function have an impact on several risk and protective factors. Pakistan, like other nations, has responded to the present COVID-19 outbreak on all fronts, including public health, but a number of difficulties must be addressed. Pakistan's health-care system is poorly underfunded, and it does not meet the needs of people suffering from psychological disorders. There is a shortage of psychiatrists, and there is a significant gap between the demand for therapy and its supply. Even when assistance is provided, it is frequently of poor quality. People suffering from mental illnesses require social support, including assistance in forming and maintaining social, familial, and personal relationships. They also require aid with housing, employment, educational opportunities, and other enriching activities, for which specific institutions must be established.

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## Review Article

## An Approach to Available Literature about Association of Blood Redox State and Exercise

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## ARTICLE INFO

**Key Words:**

Exercise, Blood Redox State, Oxidative Stress, Antioxidants and Reactive Oxygen Species

**How to Cite:**

Irfan Munir, M. ., Iqbal Butt, Z. ., & Khan, A. (2022). An Approach to Available Literature About Association of Blood Redox State and Exercise: Association of Blood Redox State and Exercise. *Pakistan Journal of Health Sciences*, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.342>

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Received Date: 14<sup>th</sup> November, 2022Acceptance Date: 25<sup>th</sup> November, 2022Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

Imbalance between reactive oxygen species (ROS) and antioxidants is termed as oxidative stress. Although low level of ROS are considered beneficial and important for normal functioning of cells. This research study review the available literature about exercise with various intensities and blood redox state. In this regard, data from 2015 to 2022 were collected from different search engines including PubMed, Web of Science, Scopus and Google scholar. The collected data were analyzed through qualitative data analysis technique and thus the researcher arrived at conclusion that exercise with moderate intensity having beneficial effects on blood redox state as compared to high intensity exercise.

## INTRODUCTION

Physical activities with moderate volume and intensities promote the functional capacities of whole body systems. Physical activities with high volume and intensities effect the resistance capacity of the body against oxidative stress [1]. Oxidative stress refers to imbalance state of ROS and antioxidants. In sedentary as compared to active people, level of oxidative stress is found high [2]. Physical activeness reduce the antioxidant capacity and induce the rise of ROS which cause oxidative stress and thus it effect the physiology of various body systems. To strengthen the functional capacity of antioxidant defense mechanism, exercise with sufficient volume and intensities are encouraged. Exercise has positive association with oxidative stress and cardiovascular risk factors such as

blood pressure, body mass index and fats percentage in postmenopausal women [3]. Regular exercise and antioxidant supplementation having more favorable effects on physical function and resistance to oxidative stress and thus its helps in reducing cardiovascular health complications [4]. Different studies shown that high intensity exercise increase the production of Reactive oxygen and nitrogen species (RONS) that cause several damages to Lipid, DNA, and protein oxidation in blood cells. High level of RONS may cause cardiovascular problems, problems of immune system and increase the risk of some cancers. Regular exercise helps in reduction of RONS by strengthening the antioxidants capacity of the body [5]. High intensity exercise performers as well as heavy



drinkers may be proven at high level of oxidative stress. To avoid the oxidative damage of alcohol and exercise, dietary supplements are suggested [6]. For improvement of performance, dietary nitrates and thiol antioxidants are considered important particularly for endurance trainers. Both are considered safe for human being. Therefore single dose of both may have positive impact upon performance [7]. Research study shown that long as well as short distance runners both having similar blood redox status. In addition, higher activity of catalase in long distance runners was also observed. It may be due to high oxygen load imposed during repeated prolonged exercise bouts [8]. Improvement in quality of life is closely linked with exercise among patients with chronic diseases. It means that exercise strengthen the functional capacity of immune system [9]. Oxidative stress and redox dysregulation are considered responsible with asthma. Due to chronic inflammation, lungs tissues are exposed to a range of exogenous (Exogenous sources include air pollutants, particulates, and cigarette smoke, with endogenous ROS produced as by-products of mitochondrial respiration, inflammatory cell responses to allergens and microbial infections ) and endogenous reactive oxygen (ROS) and nitrogen species (RNS) [10]. Exercise with moderate intensity promote cardiovascular health and strengthen the immune system by promoting the antioxidant system of the body. Likewise, it's also promote and maintain blood redox state[11-14]. In addition, moderate intensity exercise significantly affect lungs functions (IRV &ERV) [15]. Long term regular exercise promote health by maintaining blood redox state. High intensity exercise without adaptation and nutritional supplementation may cause oxidative stress[16]. In view of the above studies, now it is clear to say that blood redox state is very closely associated with exercise. So what type of exercise having positive effects on blood redox state and what kind of exercise having negative effects on blood redox state? To discover the fact, this review study was initiated.

## METHODS

To reach at certain findings and conclusion, the researcher adopted the following procedures; at 1st step, more than 100 articles were collected from different search engines such as Google Scholar, PubMed, Web of sciences and Scopus etc. After collection of relevant articles, articles were divided into two categories i.e. category-1 articles (articles from last 20 to 22 years) were used for background section and category-2 articles (articles from last 5 to 7 years) were used analysis section of article. At initial scrutiny, more than 75 non-relevant articles with keywords of the study were excluded. Similarly after initial scrutiny, articles of Google Scholar, and PubMed were included in

the study. At end, qualitative data analysis (QDA) technique was adopted for analysis of data as shown in table 1.

Authors	Years	Sample	Major Findings
Khan et al [17]	2021	Low and High Intensity Exercise Performers	Low intensity promote antioxidants mechanism while high intensity exercise induced oxidative stress
Tofas et al [4]	2019	Meta-analysis	Exercise reduce the risks of cardiovascular problems
Lu Y, Wiltshire HD, Baker JS, Wang Q.[18]	2021	Meta-analysis	Regular exercise promote fitness and empower antioxidants activities
Parker L, Trewin A, Levinger I, Shaw CS, Stepto NK [19]	2018	Eight healthy adults performed a cycling session	Blood redox state and exercise intensities are associated with each other
Said M [5]	2016	Meta-analysis	Strenuous physical activities caused an increase in ROS
He F, Li J, Liu Z, Chuang CC, Yang W, Zuo L [20],	2016	Meta-analysis	Endurance, sprint and mountain climbing exercise cause production of ROS
Spanidis Y et al [21]	2018	Forty volunteers (trained & untrained)	Training adaptation as well as nutritional supplementations promote blood redox state and reduce ROS
Reid MB [22]	2017	Meta-analysis	Dietary supplementations and exercise endurance strengthen antioxidant activities and blood redox state
Georgakoul K et al [23]	2022	17 heavy drinkers	Heavy drinkers prone more to oxidative damage and exercise activate antioxidant defense mechanism

**Table 1:** Analysis of data from literature

## CONCLUSIONS

After critical review of previous articles, the researcher draw the conclusion that exercise have a significant effects on blood redox state. In addition the study also shown that low intensity exercise positively effect the blood redox state. The literature review also shown that long term high intensity exercise without nutritional supplementations cause oxidative stress which leads the body toward different health problems. The findings of the study also reveals that for avoiding the health related risks of exercise, proper nutritional supplementation is considered essential.

## ACKNOWLEDGMENT

This paper is a part of my Ph.D. dissertation; therefore, as a Ph.D. scholar I am very thankful to my supervisor and co-supervisor for the completion of this particular research work.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Review Article

## Origin, Synthesis and Various Mechanisms of Hypericin as Antidepressant, Photosensitizer and Antiviral

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## ARTICLE INFO

## Key Words:

Hypericum, emodin, depression, solubility, anti-viral

## How to Cite:

Ahsan Waqar, M. ., Riaz, T. ., Zaman, M. ., Majeed, I. ., Nadeem Alvi, M. ., Ishaque, A. ., Tabassam, N. ., Mehboob, T., Waqas, M. ., Munir, M., & Tayyab, S. . (2022). Origin, Synthesis and Various Mechanisms of Hypericin as Antidepressant, Photosensitizer and Antiviral: Hypericin as Antidepressant, Photosensitizer and Antiviral. Pakistan Journal of Health Sciences, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.321>

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## ABSTRACT

Large number of hypericum species have been found around the globe. One of which is the Hypericin, that is extracted from the *Hypericum perforatum*. This review focuses on the brief history of the hypericin, its various natural and semisynthetic sources, the precise pharmacokinetics of the hypericin as well as describes the detailed actions of hypericin as an antidepressant, antiviral and as a phytotoxic agent. In chemical synthesis, Emodin had been found to be the ultimate likely hypericin precursor. Hypericin is not a newly discovered agent to the community of research, nonetheless it has been accomplishing an innovative and a promising position as a very effective agent in the medical diagnostics as well as in the therapeutic applications. Hypericin had been investigated as a good candidate for the treatment of depression, cancer and also had an efficacy against various viral agents as well. Depression is treated by voltage dependent Ca<sup>2+</sup> influx reduction. Photosensitizing property is due to hemoglobin absorption. Antiviral activity is through the deactivation of enveloped viruses in life cycle of virus. With relatively fewer side effects this agent can be utilized as an alternate of various semisynthetic medications.

## INTRODUCTION

Saint John's wort or also known as Hypericum, has been among the nine genera that belongs to family of Clusiaceae Lindl and is extensively found all over the globe. Very huge quantities of the species of Hypericum, that includes *Hypericum perforatum* L., *Hypericum androsaemum* L., *Hypericum perforatum* L., *Hypericum chinense* L. and *Hypericum ascyron* L., had been mostly found in Asia, Europe, North America as well as in North Africa. The hypericin concentration varies depending on the species are mentioned in Table 1[1].

Hypericum species	Hypericin (mg. g <sup>-1</sup> )
<i>Hypericum perforatum</i>	3.69
<i>Hypericum ensliense</i>	3.00
<i>Hypericum hirsutum</i>	0.43

<i>Hypericum aviculariifolium</i>	2.14
<i>Hypericum lydium</i>	0.18
<i>Hypericum montanum</i>	1.42
<i>Hypericum perforatum</i>	1.06
<i>Hypericum organifolium</i>	1.43
<i>Hypericum pruinatum</i>	0.79
<i>Hypericum tetrapterum</i>	0.84
<i>Hypericum wightianum</i>	0.023
<i>Hypericum montbretii</i>	1.39

**Table 1:** Concentration of Hypericin (mg. g<sup>-1</sup>) in various Hypericum species  
Hypericin is a drug substance that is obtained from *Hypericum perforatum* (Figure 1), that historically had been mainly used as a medicine. Bucher was the scientist who first revealed that hypericin is an active constituent of the *Hypericum perforatum*, as well as this was then later

retitled as hypericin by Cerny in the 1911 [2]. In 1939, first comprehensive isolation report of the hypericin by the Brockmann et al., [3]. In 1942, very first chemical formula of the compound hypericin had been reported by Brockmann et al., [4] that is C<sub>30</sub>H<sub>16</sub>O<sub>8</sub> as well as after 8 years, accurate structure had been published by same author [5].



**Figure 1:** *Hypericum perforatum* (St. John's wort)

Literature had shown that hypericin is seldom mentioned as a derivative of naphthodianthrone as well as in the chemical abstracts as 1, 3, 4, 6, 8, 13-Hexahydroxy-10, 11-dimethylphenanthro [1, 10, 9, 8-opqra] perylene-7, 14-dione. Hypericin having molecular weight of 504, had a color of brownish black powdery form and also had a specific type of bitter taste which had mostly been found in the *Hypericum* plants [6]. Recent reviews attribute status of the hypericin for the cancer treatment [7] as well as also discusses the relevancy of its physical and chemical properties to the pharmaceutical applications [8, 9]. It had been also originated to be mainly effective as the antiviral drug against human immunodeficiency virus [10], herpes virus [11], novel duck reovirus [12], hepatitis C virus [13] and infectious bronchitis virus [14]. Hypericin had also shown some activity as an antioxidant, antimicrobial agent as well as a good choice for the photodynamic diagnosis [15, 16]. This review aims to summarize the natural sources of hypericin, its synthesis from various compounds, kinetics of hypericin and some recent studies that had been performed to prove its efficacy as an antidepressant, phytotoxic and as an antiviral agent.

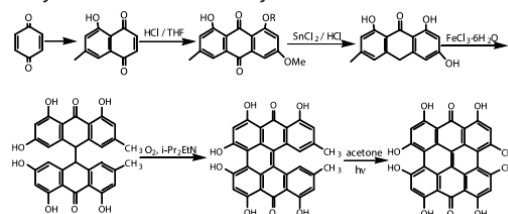
### Sources and Kinetics of Hypericin

Hypericin is a natural occurring bioactive crude substance that could be extracted from the plants, insects as well as from the protozoa [17]. It has been found in superficial layer of Australian Lac insects that belongs to family Coccoidea, as well as found in blue-green ciliate, *Stentor coeruleus*, that is a form of the protozoa. Genus *Hypericum* covers 484 species that are further divided into 36 sub-groups [18]. Out of that the most crucial and recognized specie is the *Hypericum perforatum* that is most usually recognized as St. John's wort. The concentration of hypericin differs and depends on species, as well as topographical locations of *Hypericum* [1, 19] and also on the part of plant. Some recent investigations on kinetic profile of hypericin in humans by using pure hypericin in pure form (0.05 mg/kg body weight)

once a day orally had shown the elimination half-life of about  $33.8 \pm 18.8$  hours, very similar to another study in which the subjects had received 0.1 mg hypericin per kg body weight and had shown elimination half-life of  $36.1 \pm 22.6$  hours. The bioavailability was observed to be 20 % and the steady state had been achieved at two weeks. By daily dosing, no drug accumulation was observed. Any kind of metabolism of hypericin was also not observed in correspondence to mean area under the curve (AUC) determinations that were of 1.5 and 3.1  $\mu\text{g/ml}$  hours respectively [20]. The absorption of hypericin was found in intestine deprived of being metabolized. According to its size of molecule (> 500 Da) and chemical structure, this had been assumed that is excreted in the bile [21]. Moreover, the hypericin had shown a higher non-specific attraction to detergents, lipids and proteins. Kinetic data from a mice in a study had also suggested a distribution half-life of hypericin of about 2 hours as well as an elimination half-life of about 38.5 hr. [22]. These studies had been quite surprisingly similar to the human studies.

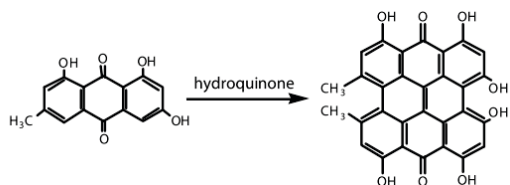
### Synthesis of Hypericin

Hypericin biosynthesis in the *Hypericum* is much further complex than already identified chemically synthetic routes as well as comprises expression of the multiple genes. Generally recognized biosynthetic hypericin pathway could be further divided into two foremost parts, firstly emodin anthrone is formed and then in the second process it is converted to hypericin [23]. Emodin anthrone has been the most probable immediate precursor of hypericin. Many previous investigations had reported that the synthesis of emodin anthrone had followed the pathway of polyketide. Emodin dianthrone could be also formed by condensation reaction of emodin anthrone and the emodin. That after ward then undertakes oxidation to form the protohypericin, and at last protohypericin then is converted to hypericin on irradiation. A scientist Bais et al., [24] had found that the biosynthesis of hypericin is associated to a gene that has been labelled as hyp-1. In 1957, Brockmann, et al., [25] had published very first multistep production of hypericin that was from the chemical synthesis method as shown in Figure 2. Synthesis from this route initiates with reaction of chloral hydrate and 3,5-dimethoxybenzoic acid methyl ester.



**Figure 2:** Hypericin synthesis from 1,4-benzoquinone

Many scientists had now established an even much more simple method to formulate hypericin. In another study, [26, 27] as illustrated in Figure 3, Emodin was transformed to hypericin by the use of hydroquinone as catalyst under nitrogen and the light illumination after 2 weeks.



**Figure 3:** Direct synthesis of hypericin from emodin

### Antidepressant Activity of Hypericin

Depression, a psychiatric condition which had been assessed to affect about 21% of population of the world [28]. Nowadays, four major classes of antidepressant drugs are being prescribed in clinical practice, that includes, selective serotonin reuptake inhibitors (SSRI), norepinephrine-serotonin reuptake inhibitors (NSRI), tricyclic antidepressants (TCA) and monoamine oxidase inhibitors (MAO). Regrettably, all of these drugs have shown undesirable side effects as well as about 30% of the patients have not respond to these drugs [29]. Consequently, seeking effective and safe antidepressant drugs from the natural and traditional herbs might aid us to discover a novel approach for the treatment of depression. St John's wort preparations are now progressively being used in the depressive disorder treatment [30]. In contradiction of the many rests of the herbal products, effectiveness of St John's wort had been extensively studied in the controlled trials. A new study had reported that some of these trials [31] had shown that St John's wort is much further effective than the placebo for the very short term treatment of moderate to mild depressive conditions. Furthermore, Volz Ž. Ž. In 1997, Stevinson and Ernst in 1999 as well as Maidment Ž. In another study, by use of a preparation of the nerve terminals from cerebral cortex of rat, a new finding was found that the hypericin had effectively inhibits the increased glutamate levels. These investigations had represented the very first investigation of the effect of St. John's wort on endogenous outbreak of glutamate at the presynaptic level. Few early studies had also revealed that antidepressant activity of the hypericin was because of the inhibitory of MAO. However, this activity was originated as in vitro with the extracts concentrations appears to be too high (i.e., > 100 Ag/mL) to be accomplished in vivo [32].

### Photosensitizer Action of Hypericin

Hypericin photosensitizing properties were first known by investigating various reasons of the hypericism among the animals [33]. Hypericin salts yields solutions with color of wine red in the organic solvents with absorbance  $\lambda_{max}$  of

548 and 591 nm in the ethanol as well as with a typical red fluorescence ( $\lambda_{max}$ : 594 and 642 nm in ethanol), while it tends to form the nonfluorescent high molecular weight aggregates in the solutions that are aqueous [34, 35]. Another site of the intracellular accumulation of hypericin is considered to be lysosomes. Lysosomes works as cell recycling centers which breaks down the molecules which are considered very complex, as well as it damages organelles and components of cell that includes the external pathogens. All of these have been destroyed by enzyme lysosomal hydrolases as well as the products of this collapse and are then dispersed into the cytosol to be either more catabolized as well as recycled into novel components of the cell. Lysosomal integrity of DU145 cells succeeding hypericin sensitization had been evaluated by the monitoring of the action of hexosaminidase enzyme in many other compartments of the cell [36]. These studies had concluded that the damage of lysosomes have not seem to be a key modus operandi of the multifaceted phototoxicity of hypericin. The cells last temporary disruption of lysosomes possibly due to lysosomal enzymes have been disabled that may be either from photodynamic treatment itself, cytoplasm - lysosome lumen pH difference or through the cytosolic inhibitors [37].

### Antiviral Activity of Hypericin

Light induced virucidal activity of hypericin had been observed against numerous types of the viruses including murine cytomegalovirus, herpes, sindbis, equine anemia [38], hepatitis B [39] as well as in human immunodeficiency virus (HIV). Hypericin had been also utilized in treatment of patients suffering with AIDS [40]. It had also shown that therapeutic doses of 0.25 mg/kg when administered to patients two times a week during 2 years, a significant decrease in propagation of HIV infection was observed with comparatively lower adverse effects. Two distinctive properties had been seen for its antiviral activity of as well as for the compounds that are structurally related to hypericin, firstly, they efficiently deactivate the enveloped viruses, nonetheless are very much futile against the non-enveloped viruses [41], and secondly the antiviral activity of Hypericin is strongly triggered and increased by the light. Meruelo et al., have anticipated a mechanism that shows Hypericin inhibits a virus budding as well as maturation at membrane level [42]. Hypericin had also shown to be induce a substantial deactivation of numerous viruses upon contact to the visible light as well as in many cases also observed under the dark conditions. Especially, it had been stated that Hypericin deactivates some variety of the enveloped viruses, although it is very inactive in contrast to the viruses that lacks membranes [43]. A study reported that hypericin is a very effective virucidal agent against the BVDV as well as HIV-1, that acts as a model for the HCV.

Complete inactivation of the 106-tissue culture-infective doses of HIV-1 in entire blood was shown as well as in the diluted packed red cells upon illumination of 50 µg/ml and 20 µg/ml hypericin. BVDV had shown to be much more sensitive to be inactivate by the hypericin than the HIV [44].

## CONCLUSIONS

Number of publications about Hypericin as well as its derived compounds had increased remarkably in the recent decades. This review has focused on the natural and synthetic sources from where hypericin can be obtained and can be utilized for the pharmacological purposes. It could be obtained from several species of *Hypericum* and can be utilized for the pharmacotherapy with minimum side effects than the allopathic medicines. Emodin had been found to be the major precursor for the formation of the Hypericin during the chemical synthesis. Hypericin at specific doses had shown many pharmacological activities such as the antidepressant, photosensitizer and antiviral, yet there are to much more studies that are required to be done to know the exact mechanism of the hypericin for these effects.

## Conflicts of Interest

The authors declare no conflict of interest.

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Review Article

## Public Health Perspectives of Genetically Modified Food: A Comprehensive Review

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## ARTICLE INFO

**Key Words:**

Food production, Genetically Modified Foods, Microbial Proteins, Human Health

**How to Cite:**

Asif Ilyas, M. ., Ali, M. ., Aslam, M. ., Hassan, A. ., Muqaddas, R., Akhtar, N. ., Zahid Aslam, M. ., Ketema, S. ., Fiza Nayab, S. ., Arshad Maan, N. ., Razaq, Z. ., & Ullah, I. (2022). Public Health Perspectives of Genetically Modified Food: A Comprehensive Review: Public Health Perspectives of Genetically Modified Food. *Pakistan Journal of Health Sciences*, 3(06). <https://doi.org/10.54393/pjhs.v3i06.165>

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Received Date: 24th September, 2022

Acceptance Date: 9th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

Now a day food fortification using genetically modified organism was highly popular, secured and affordable for the current food demanded population. Many commendable uses of microbes were found in genetically modified Food. This review paper attempted to address the impact of microorganisms employed in genetically modified food. PubMed, Science Direct, Google Scholar, and other search engines were used to collect papers. The impact of microorganisms in Food Productions was briefly explored and illustrated in the table and figures. Climate resilience, high yield, environmental adaptability, and high protein, 40-50% and 20-40% produced by bacteria and alga respectively, were only a few advantages of foods that have been genetically modified foods with microbes. Additionally, it improves human health by reducing poverty, ensuring food security, and preventing disease. Therefore, genetically modified foods brought a positive impact for human health.

## INTRODUCTION

Genetic modification and its practical utilization in processing genetically modified foods (GMF) has the ability to make uncertain risk to human health that may be direct or indirect or short term or long term [1]. The Islamic frame of reference on GMF is complicated and goes deeper than

food is halal or haram [2], (even so that is clearly part of it). There are 3 major protests to genetic adjustment including perceive as reason of divine work, damaging human health, prepared from prohibited resources [3]. However, GMFs were prepared from natural resources occurred for

intended consumers and improve quality of human life through food security without deviate the religious perspective. In accordance to Islamic Jurisprudence Council (IJC), foodstuffs traced from genetic modified organism (GMO) plants are suitable for ingestion to Muslims [4]. Few scholarly people have recommended that foodstuffs traced from biotechnologically modified plants could may be become forbidden if they comprise DNA from prohibited foods. For example use of swine DNA in soy, might render it haram, till the theme of some argument among scholars were certifying organizers [5], to be brought commodity with a gene editing non haram food items, today it would be well thought out more questionable on the consumers sides thus, all biotechnological food items on the marketplace must be authorized resources [6]. However, the Islamic Food and Nutrition Council of America (IFANCA), Islamic Jurisprudence Council (IJC), Majelis Ulama Indonesia (MUI), Majlis Ugama Islam Singapura (MUIS), Saudi Arabia, the government of Malaysia and the Muslim World League were accepted and undisputed Halal food products and attested body developed from biotechnology [5, 7, 8]. This compressive review paper try to justify as witness through grasping researcher suggesting regarding public health perspectives of genetically modified food, which is very significant for reader to catches noticeable evidence from the paper.

### Concept of Halal and Haram

All property has been divided into legal and illegal categories, according to the Islamic doctrine every activity, strategy, physical thing, food, and conduct were stated as the terms "Halal" and "Haram" [7, 9, 10]. Thus, non-edible food types had poison character for human beings and it is the reason that protect their followers through underline as taboo [11]. For instant blood, carrion, and swine flesh are "forbidden unto you (for solid food), and those have been devoted else Allah, and the dead by beating, the smothered, the dead by way of falling from an elevation, eat up of wild beasts, which have been killed by outgrowth rescue, which make lawful, and that have been sacrificed unto statue [12, 13].

### Genetically Modified Foods

These are the edible items that are made by the organism which have revised deoxyribonucleic acid (DNA) by the processes of genetic engineering in contrast to the natural breeding. Genetic modification, as well as its practical application in the processing of genetically modified foods (GMF), has the potential benefits to human health, either directly or indirectly, in the short or long term [1]. The Islamic viewpoint on genetically modified foods is complex and goes beyond assessing whether a meal is halal or haram [14]. "O ye who believe! Eat of the good things

wherewith we have provided you, and render thanks to Allah if it is (indeed) He whom ye worship" (2:172). To form a genetically modified food it takes multiple steps. Firstly, we have to isolate the intended gene of our use from that particular cell or we have to make it in a laboratory [15]. And then add remaining all other components with the gene which is necessary for its maturation and then place it in the targeted gene [16]. So, a whole organism is grown from this gene. GMF in the United States are organized to assure their safety for human use. According to Piedmont clinical dietitian Jennifer Teems, LD, RD, MS, "GMOs are not natural and could never occur organically" But, it's crucial to keep in mind that today's foods and products must adhere to far stricter criteria than in the past [17-19].

### According to the point of view of American Academy of Environmental Medicine (AAEM)

According to Teems, "it is challenging to research food and understand the effects of GMOs" because it is so complicated. I advised my patient to give up on trying preventing GMOs because it is almost impossible. Instead, concentrate on eating a heart-healthy diet that is high in fruits and vegetables, low in added sugar, and free of pre-cooked items [20, 21].

### Effect of GMOs on body

Despite, GMO brought unremarkable public health benefits for consumers; the negative human health consequences were investigated by researchers [1, 18, 22], it including;

- . Infertility
- . Changes to major organs and the gastrointestinal system.
- . Immune problems
- . Accelerated aging, faulty insulin regulations
- . Increased quantity of herbicides in food

### History

Human-directed genetic processing of food began once plants and animals were farmed through at about 10.500 to 10.100 BC, by artificial selection [23]. The following generations and organisms were employed with desirable features (and hence with the desired genes). Lack of character is not a foundation to the present genetic modification notion [24]. In early 1900s by discovering DNA and creating various advances in genetic technologies, DNA and genes within food have been directly changed. By the United States Food and Drug Administration, which authorized in 1988 the first use of genetically engineered microbial enzymes in food production was used. Recombinant chymosin was authorized in numerous nations in the early 1990s. Scientists had made cheese from cow's milk by introducing bacteria to make chymosin, which can also coagulate milk, leading to cheese curds. Flavor Saver tomato was first genetically modified product to be released in 1994. The product was developed by

Calgene, Inc. by introducing a gene that delayed its maturation to have a longer lifetime. China was the first nation with virus resistance introductions to sell a transgenic crop in 1993, tobacco. In 1995, the cultivation of *Bacillus thuringiensis* Potato, the first crop generating pesticide to be licensed in the United States, was permitted [25]. Genetically modified plants are also sold. In 1995, transgenic canola, GI, cotton resistant to *bromoxynil*, maize Bt, and cotton Bt were introduced. Other commercially viable genetically modified plants that were approved in 1995 were tomatoes, squash that could survive glyphosate, other varieties of tomatoes, BT maize, and cotton that could withstand herbicides like *bromoxynil* (Figure 1). With the introduction of rice in 2000, scientists had GMF in order to boost the worth of their nutrients first time [18]. The report is in French only. By 2010, 29 nations have been planting marketed biotech crops and 31 more granted transgenic plant regulatory permission for import. The US was the largest manufacturing country. And GMF producer obtained regulatory approval in 2011 for 25 genetically modified crops. 92% in 2015 Maize, 94% cotton and 94% soybeans made in the United States were genetically modified strains. Advantage Salmon in 2015 was the first GM animal to be licensed to utilize food, Salmon has been changed from Pacific Chinook salmon and a growth hormone regulating gene Proponent of an ocean pout that allows it to develop all through the year instead of only in spring and summer. After USDA declared in April 2016 that it would not have to go through the Agency's regulatory procedures, the white button mushroom (*Agaricus bisporus*) was modified handling CRISPR technology obtained de facto approved in the United States [19].



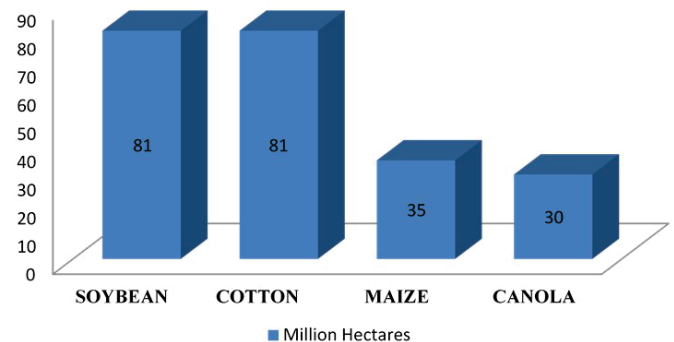
**Figure 1:** Genetically modified foods. Adapted from: <https://pin.it/qGBvoSe>

### Derived products from GMO

Different countries also incorporate plant based

technologies to maximize their production for the demand of population. The derived products of genetically modified foods Figure 2, including;

- . Carbonated soft drinks (high fructose corn syrup made from sugar beets)
- . Meat (farm animals are raised with genetically modified feed containing soy products)
- . Canned soups (corn-based thickeners and flavoring enhancements)
- . Tofu (GMO soybeans)
- . Cereals (corn and soy products and non-cane sugars)
- . Vegetable and canola oils (rapeseed - canola, soybean, corn, sun flower, safflower)
- . Sweetened juices (corn- and sugar beet-based sweeteners)
- . Frozen foods (starch is added from GM corn, fats and oils from GM plants, citric acid made from GM microorganisms)
- . Milk (cows are fed genetically modified soy products)
- . Baby formula (GMO corn, sugar beets and soy)



**Figure 2:** Popular plants production and their traits reported in 2012.

### Maltodextrin

A lightweight hydrolyzed starch commodity utilized as filler and thickening for soft-tasting. A number of glucose syrups, often termed American maize syrups, have been employed in many types of Commercial glucose, and is made with full starch hydrolysis. By handling of dextrose solutions which comprises the enzyme glucose isomerase, a huge part of glucose was converted into fructose. Sugar alcohols, like maltitol, erythritol, mannitol, sorbitol, as well as by reducing sugars, hydrogenated starch hydrolysate is made sweeteners.

GMFs Classification	Strongly Opposed	Strongly Opposed	Relatively Opposed	Natural or Indifferent	Relatively Acceptable	Completely Acceptable
Edible Purpose	(1) Soybean oil from GM soybean	26.3	34.2	25.7	11.1	2.7
	(2) Livestock aquatic products fed with GM Maize	18.3	25.8	37.4	16.6	1.9
Function of Transcribed Gene	(3) Nutrition improving GM crops	12.4	19.5	41.4	25.2	1.5
	(4) Pest or herbicide resistant GM crops	9.5	14.8	41.4	28.2	6.4
Source of Transcribed Gene	(5) GM crops created from another plant spp.	10.0	12.6	45.4	21.4	10-15
	(6) GM crops created from an animal body)	15.1	14.3	55.0	11.8	3.7
	(7) GM crops created from a microbe	14.0	13.9	54.0	12.6	4.6

**Table 1:** Public acceptance and objection study survey reported in 2014.

### Lecithin

Lecithin is a lipid that occurs naturally. The egg yolks and petroleum plants may be located here. It is an emulsifier and is thus utilized in a large number of meals. Corn, soy as well as safflower oil are lecithin sources, however, most commercially available lecithin comes from soy. The report is not available at all. However, public worries about genetically modified food are extended to these items in Table 1. This worry has led to changes in policies and regulations. In 2000, the labeling of a product containing GMO ingredients, including lecithin, was adopted for Europe in Regulation (EC) 50/2000. Because derivatives such as lecithin have trouble determining their origin with present testing techniques, EU laws call on firms wishing to trade lecithin in Europe to utilize an integrated recognition conservation scheme.

### Sugar

The United States fulfills its 90% requirement of sugar from sugar cane and sugar beet and the remaining 10% is fulfilled by importing the sugar. Glyphosate-resistant sugar beet was widely used in the U.S. following isolationism (2005). In 2011, the glyphosate-resistant seed was planted on 95% of beet acres in the United States. The pulp is utilized as animal feed through the refining process. GM sugar beet sugar does not include DNA or protein – it's sugar that can't be distinguished from non-GM sugar beets scientifically. Independent analysis by established worldwide laboratories showed that sugar beets from Roundup Ready are the same as conventional (non-roundup ready) sugar beets produced in comparatively large quantities. There was a small quantity of DNA or protein in vegetable oil from the real crop. By extracting and refining triglycerides from the semis or plants vegetable oils are produced, and then by hydrogenation converting solids from liquid oils. MCT's provide an alternative to traditional fats and oil. Edium-chain triglycerides offer an option. During digestive treatment, the duration of fatty acid affects its fat absorption. Fatty acids appear to be absorbed more readily and to affect glycerol molecules in the mid location, Metabolism in the end positions rather than fatty acids. MCTs are digested

like carbohydrates in contrast to conventional fats [20].

### Traceability of GMOs in food production chain

Traceability systems and written document product record may service marketing as well as health protection purposes. Traceability systems both Segregation as well as identity conservation technologies enable the separation of non-GM and GM goods from 'farm to fork' in this context. Specific technological criteria for each individual stage of the food production chain are included in implementation.

### Testing

GMFs are legal and regulated differently in different countries; some countries prohibit for consumption, while others allow at varying levels. Countries were reported that test is required to recognize GMFs safe for human consumption throughout production and distribution [3, 16]. Further tests on potential toxicity, allergen city, potentiality transference of genes to human people or genetic transmission to other animals may be necessary if novel chemicals are detected [1].

### Labelling

By 2015, 64 nations are required on the market to label GMO goods. National policies in the US and Canada only need a label given major variances of content or demonstrated effects on health, despite the fact that certain individual U.S. legislation calls for them. Public Act 114-214 was introduced in July 2016 to regulate on a nationwide level, the labeling of GMO food. The labeling requirement in some countries relies on the proportional measure of GMO in the product. Research investigating voluntary labeling indicated that 31 percent of GM-free items have a GM concentration and exceeding 1.0 percent in South Africa. All food or feed containing more than 0.9 percent of GMOs in the European Union should be labeled (including prepared food).

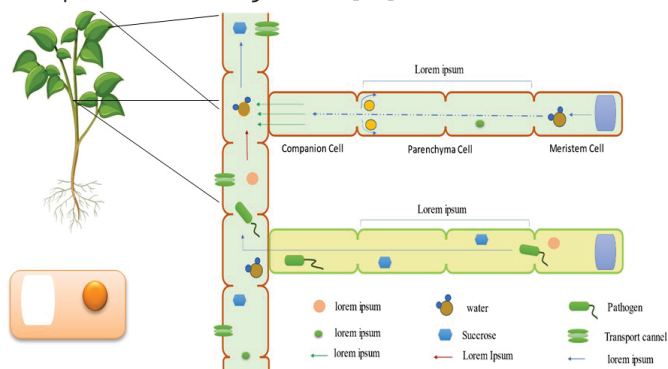
### Detection

GMOs are frequently tested in foodstuffs and feed using molecular methods like poly meres chain reaction (PCR) and bio-informatics. The absence of Roundup Ready (RR) Soybean has been monitored in January (2010) report on detection and extraction of DNA through an entire industrial soybean oil production chain: "In all stages of the extraction and refining operations, soybean lectin generation amplified using an end-point (PCR), until the

completely refined soybean oil has been completed. In addition to the intermediate stages of refining (neutralization, wash and bleaching), probably owing to try instability, amplification of RR soybeans using PCR tests with event specific primers was attained for all extraction as well as refining procedures. This is a major achievement for the traceability of genetically modified organisms in filtered oils and has never been reported to us previously. The ideas suggested by the Natural Resources Conservation Service and the Farm Service Agency are by the point of view of Thomas Redick, for detecting and preventing cross-cutting pollination(NRCS)[5].

### Beneficial Aspects of GMF

GMF provides good pest resistance, flavor, and longer shelf life, and reduces the need for chemical fertilizers [16]. We can reduce the chemicals used for insecticides and pesticides by the addition for the purpose less harmful for human [19] as shown in Figure 4. GMF can produce strong crops which can survive in the harsh environment and adapt climatic condition. China has decreased the quantity of pesticides consumed by more than 75% after acceptance of bio-engineered [17].



**Figure 3:** Gene editing plat resist intended pathogens and produced high yield.

Basically, GMF products demand minimal chemicals and take little time, which helps in decreasing the emission of greenhouse gases, eroding soil, environmental impurity, and global warming by a decrease in carbon dioxide levels in the environment. So, GMF have good quality and more protection than the natural foods. Genetically modified food is an attempt to cover up the deficiency of nutrients in food, especially micronutrients. And produced specific vitamin or mineral including; beta-carotene, vitamin E, iron and lysine. Cooking oils (canola, soybean, maize) contain less saturated fat levels and boosted amino acids [8].

### Harmful Aspects of GMF

Along with many useful aspects of genetically modified foods have some harmful aspects. Which were included hypersensitivity and allergic reactions. Experts were demonstrated that GMOs are safe and sound for the environment, but they really yet comprise numerous types

of elements not clear for public [22]. Genetic engineering alters the ecosystem that harms some organisms which can lower the biodiversity level. In genetic engineering when it removed harmful pests from a specific food, it must be kept in mind that reduces the food resource for convinced species. Few GMOs have antibiotic characteristics and are resistant to some viruses, bacteria, and some diseases and decreased antibiotic drug's efficacy [6].

## CONCLUSIONS

By increasing productivity and reducing reliance on chemical pesticides and herbicides, genetically modified organisms (GMOs) have the ability to address the world's malnutrition and starvation crisis and contribute to environmental protection. However, there is currently unresolved ongoing debate that transgenic components from pork or other "harem" or "mushroom" products in food items obtained through biotechnology will continue to play a major role in Halal certification.

## Conflicts of Interest

The authors declare no conflict of interest.

## Source of Funding

The authors received no financial support for the research, authorship and/or publication of this article

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## Original Article

## A Cross Sectional Study on Nurses Knowledge and Practice of Essential Newborn Care at Tertiary Care Hospitals of Bahawalpur

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## ARTICLE INFO

## Key Words:

Nurses, Knowledge, Practice, Essential Newborn Care

## How to Cite:

Kousar, R. ., Afzal, M. ., Qadir, A. ., Sakina, R. ., & Asim Amin, M. . (2022). A Cross sectional Study on Nurses Knowledge and Practice of Essential Newborn Care at Tertiary Care Hospitals of Bahawalpur : Nurses Knowledge and Practice of Essential Newborn Care at Hospitals. *Pakistan Journal of Health Sciences*, 3(06). <https://doi.org/10.54393/pjhs.v3i06.305>

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## ABSTRACT

The newborn survival, growth, and development depend on the knowledge of essential infant care and correct application. The World Health Organization's guideline is crucial, yet the majority of healthcare professionals are unaware of it and do not adhere to it. Four million infants die every year, primarily in developing countries. For every 1,000 live births in Pakistan, there are 40.4 neonatal fatalities. **Objectives:** To examine nurses understanding and their application of newborn care at Bahawalpur tertiary care hospitals. **Methods:** At Bahawalpur's tertiary care hospitals, a cross-sectional study was done. Using a random sampling procedure, 280 registered nurses who provide labor and delivery and neonatal care were chosen. Participants were given self-administered questionnaires in order to gather data. Input and analysis of the data were done with SPSS Version 21.0. Frequency and percentages were used to present qualitative characteristics. A P value of 0.05 was employed to evaluate statistical significance. **Results:** Study participants averaged a 24.28 on a knowledge scale. 53.2 % of respondents had strong knowledge, while 47.8 % had low knowledge, according to the research. 52.1 % of respondents had an excellent level of practice, while 48.9 % had a low level, according to the mean practice score of 33.83. **Conclusions:** On some crucial aspects of neonatal care, the research population had inadequate knowledge and experience. Therefore, while assigning employees to the delivery room, preference should be given to participants with higher knowledge. Those who perform well should also be commended.

## INTRODUCTION

A newborn baby is thought to be tiny, helpless, and entirely dependent on other people to survive. Even if they are born with normal birth weights, neonates are nevertheless susceptible to a range of health issues [1]. The mortality and illness rates among newborns are particularly high. To increase their chances of survival, they need the most attention imaginable. Because the survival of a newborn baby is intertwined with a high cost. Nurses usually take a substantial role in the nursery while the baby is there, despite the fact that parents are ultimately responsible for this care [2]. However, the standardized technique for obtaining newborn care is not widely used. One of the most

important parts of health systems in terms of adhering to essential newborn care norms is knowledge. Hospital health workers. In Ethiopia, there were a performance disparity of immediate critical newborn care provided until the first hour after birth, and the average practice score for immediate newborn care was poor [3]. Basic newborn care procedures are necessary to spread knowledge and lower the infant mortality rate. The baby's subsequent well-being depends on the baby's transition to extra uterine life and first adaptations, which should be acknowledged and facilitated by health care providers at the moment of delivery and beyond by providing vital infant care. As a



result, the study's purpose was to look at the practices of nurses on vital infant care and to offer solutions to health facility heads for the found deficiencies. Nurses' care during labor and delivery is crucial to minimize unfavorable outcomes, to assure survival with prompt treatment [4]. Proper and ongoing education of the nurses regarding newborn care is the need of good quality health services. The current study is therefore designed to assess the newborn care practices among staff nurses at tertiary care hospitals. This study will provide insight for the nurses regarding newborn care in terms of knowledge enhancement. Also, this study will help the nurses to enhance their skills through educational courses regarding newborn care practices. In Pakistan, there is a dearth of research on infant care. Preventive measures for basic neonatal care could reduce the burden of infant illness and mortality[5].

## METHODS

At Bahawalpur's tertiary care hospitals, a cross-sectional study was done. Using a random sampling procedure, 280 registered nurses who provide labor and delivery and neonatal care were chosen. Nurses who didn't give delivery care for at least one year were not included. The goal of the study was to evaluate nurses' knowledge and practice of neonatal care. The institutional board of the University of Lahore gave their approval to the study. Participants were given self-administered questionnaires in order to gather data. Input and analysis of the data were done with SPSS Version 21. Frequency and percentages were used to present qualitative characteristics. A P value of 0.05 was employed to evaluate statistical significance. Data on practices were obtained using 24 items of an observational checklist built from 22 items of knowledge data [1]. Questions that were not accurate or consistent were not included in the study. Each knowledge question's correct response received one point, while each incorrect response received zero. By using the mean score as the cutoff, the dichotomy between good and bad knowledge was determined based on the total number of right answers. Assigning scores to responses on a scale of Likert 0 to 2 points 0 = never, 1 = some times, and 2 = always—was used to evaluate the standard of care for newborns. 48 were deemed to be the maximum possible cumulative score for practice. Good practice and bad practice were used as dichotomies for the overall score. The pilot study objective was to evaluate the tool's efficacy. 10 % of the study participants were selected and then removed from the sample. The questionnaire was changed in response to the pilot study's findings. The dependability was determined using the 0.760 Cronbach's alpha. The tool's content validity was also calculated; the result is 0.931.

## RESULTS

There were 210 participants 75 % who were between the ages of 25 and 30. 215(76 %) participants had between two and five years of experience, and 26(09 %) people had more than five years of experience in the most recent department. The majority of the 257 participants (91 %) worked in the labor room, while 03 % worked in the gynecology ward and 12 % of the nurses worked in the newborn critical care unit (Table 1).

Variables	Frequency (%)
<b>Age (n=48) in years</b>	
25-30	210(75)
30-35	50(17)
35-40	20(07)
<b>Years on the Job total (n=48)</b>	
2-5 Years	215(76)
6-10 Years	26(09)
> Than 10 Years	39(13)
<b>Years of employment in recent department (n=48)</b>	
1-3 Years	209(74)
3-5 Years	52(18)
> Than 5 Years	19(06)
<b>Department name, and participant job title(n=48)</b>	
Labor Room	257(91)
Gynecology Ward	11(03)
NICU	12(04)

**Table 1:** Demographic characteristics of the Participants (n=280)

When asked about what to do if a baby didn't cry right away after delivery, 228(81%) of them recognized that calling for aid and starting CPR was the best course of action, while the others were unsure. 200(71%) of the participants were asked about the baby's head posture to open the airway, and they all said that the head should be slightly extended. The other participants were unable to describe this position. Only 110(39%) of the total participants say that 40 breaths per minute are the recommended breaths per minute during infant ventilation (Table 2). 64 out of 216 respondents (or 22%) did not know that newborns should not be bathed until 24 hours have passed since delivery, but 216 respondents (or 77%) did. Regarding skin-to-skin contact and thermal protection, 222 (79.0%) and 50 (17%), respectively, knew that the baby should be quickly dried, while 08 (2%) said that it was bad to bathe the infant too young. Most respondents, 230 (82%) were aware that newborns should be placed on the mother's tummy right after birth, although 50 (17%) were unaware (Table 2). Initiation of breastfeeding should begin within the first few hours of delivery, according to 245 of the study's participants, and more than 3/4 were aware that colostrum plays an important role in a newborn's ability to fight infections. The remaining 50 participants (17%) were unaware of these facts. 245 (87.0%) of the participants

were aware that a mother should breastfeed their child exclusively for the first six months when asked about exclusive breastfeeding. 110 (39%) of the participants knew about cord care, however 170 (59%) misremembered the correct time to clamp the chord of a crying newborn (Table 2). When asked how to care for a dirty umbilical cord, 99 people (36.4 %) knew it should be washed with soap and water, dried, and not bandaged, yet 63.6% of them gave the incorrect answer. 45 (16%), 210 (75 %) and 14 (5%) of the respondents who were asked about the recommended care for low birth weight babies could, respectively, name early and frequent breastfeeding, keeping the kid warm, and infection prevention. As opposed to the WHO recommendations, 11 (4.0%) people mention bathing frequently. 220 (78.0%) of those surveyed knew that the first 24 hours after delivery are the ideal time for postnatal visits. The majority of participants in the study were informed, per the study, that vitamin K can stop infant hemorrhage (Table 2).

Knowledge	Response	Frequency	Percent
What steps are taken if the newborn does not cry?	Keep the baby covered and allow skin- to-skin contact	36	12
	Call for assistance and begin CPR	228	81
	Place baby on table and tend to mother	16	5
How should the baby's head be positioned to allow airflow?	Posture of the head in flexion	53	18
	Head in someone stretched position	200	71
	Head in a Hyper extended position	27	9
What you should give a baby if their breathing is still labored after drying?	Additional breathing stimulation	75	26
	Ventilation with a mask and bag	205	73
How many breaths per minutes is recommended during new born ventilation?	breaths per minute of 30	65	23
	40 breaths per minutes	110	39
	a minute breath rate of 60	105	37
Should a newborn be bathed?	Instantly	08	2
	prior to 24 hours after delivery	56	20
	24 hours after delivery	216	77
How can newborn avoid hypothermia?	drying instantly	50	17
	enabling skin-to-skin contact	222	79
	a morning shower	08	2
Should a newborn be kept right away after birth?	other than the mother	20	7
	paired with another	0	0
	on the mother's chest or abdomen	230	82
	on crib or changing table	30	10
When should a newborn baby start receiving breast milk?	within the first hour of delivery	245	87
	1-6 hours of delivery	30	10
	>6 hours of delivery	05	01
Does the newborn baby colostrum play a protective effect against infections?	Yes	230	82
	No	50	17
How long should a mother breast feed her child exclusively?	less than 6 month	15	05
	for 6 months	245	87
	greater 6 months	20	7
How long should you wait before clamping or tying a wailing baby's umbilical cord?	squeeze or tie immediately	120	42
	within 1-2 minutes of delivery, clamp or tie	50	17
	Squeeze or tie 2-3 minutes after delivery or when the umbilical cord pulse has stopped	110	39
What sort of tool can we use to cut the cord?	Tidy Scissors.	10	3
	A fresh Surgical blade	55	19
	A fresh razor blade	05	1
	Sterile Shears	210	75
What should I do if umbilical cord is dirty?	Wash it with soap and water then bandage it.	67	23
	do not cover after washing it with soap and water ,dry it	99	35
	to clean the umbilicus, use alcohol	114	40
What is the suggested course of treatment for a newborn eye infection?	Nothing is done	04	01
	Put some breast milk in the eye	06	02
	Using sterile water, wash the eye	70	25
	Use tetracycline or silver nitrate	200	71

What treatment is advised for low birth weight newborns?	Often Bath	11	04
	Breast feeding frequently and early	45	16
	Warm up the newborn	210	75
	Prevent the spread of infection	14	05
What is the best timing for first postnatal visit?	Within the first 24 hours of delivery	220	78
	On the 3rd day of delivery	50	17
	On the 7th day of delivery	10	03
The recommended dose of vit K for preterm baby is?	1mg	60	21
	0.5mg	220	78
Would you list the vaccines those should be given during essential newborn care?	BCG	120	42
	OPV	120	42
	Vit K	40	14

**Table 2:** Nurses Knowledge on Essential Newborn Care (n=280)

Regarding thermal protection, 220 (78%) of the participants dried all of the infants with a dry towel, while 60 (20%) only did so for some of the infants. A total of 210 (75%) of the respondents kept all of their newborns on their mothers' bellies right away, while 70 (24%) of them did not. A total of 165 (58%) of the respondents discarded wet towels and covered all of their newborns with dry towels, while 115 (40%) only did so for some of the infants. In the first hour after delivery, 245 (87%) of them started breastfeeding (Table 3).

Thermal Practice	Response	Frequency	Percent
Do you use a dry towel to instantly dry the newborn?	Not done	10	3
	Sometimes	50	17
	Done	220	78
Do you throw away damp towels and cover the newborn with dry towel instead?	Not done	10	3
	Sometimes	105	37
	Done	165	58
Do you keep the baby on mother's chest or belly right after the delivery?	Not done	10	3
	Sometimes	60	21
	Done	210	75
Do you maintain skin-to-skin contact between the mother and newborn?	Not done	05	1
	Sometimes	75	26
	Done	200	71
Do you start breast feeding your baby right away after delivery?	Not done	10	3
	sometimes	25	8
	Done	245	87

**Table 3:** Practice of thermal protection (n=280)

Regarding personal protective equipment, 220 (78%) wore sterile gloves during cord care for all babies, while 50 (17%) of them used them occasionally only. Only 211 (75%) of the total participants used clean masks for all deliveries, while 67 (23%) did not use any at all. Four responders (1% of the total) did not use clean masks at all. Only 226 people (80%) reported washing their hands before all operations when it came to hand washing during childbirth, whereas 04 people (1%) did not. Only 20 women (7%) wash their hands prior to holding the infant (Table 4). Regarding cord care, 87 (32.0%) people waited 2-3 minutes after birth to clamp the umbilical cord of any crying infants, whereas 193 (68%) people did so immediately or in less than 2 minutes. After clamping the cord, 210 (75%) of the participants cut the cord with sterile scissors; however, 70 (23%) of them occasionally did so. 120 of the study's participants (42%) said they cleaned the chord and let it air dry, while 110 (39%) said they only did this for some newborns (Table 4). Regarding eye care, 35 (12%) people only occasionally wipe their eyes, while more than half did not do so right away after birth. A total of 150 people (53%) reported applying eye ointment to every newborn, whereas 107 people (38%) said they did it occasionally. When applying eye ointment, 158 (56%) did so without coming in contact with the eyes, while just 16 (5%) did so with contact. Over 3 out of 4 individuals said they weighed and recorded the weight of every baby they delivered (Table 4). A minimum of four of the usual 11 danger signs had to be recognized by participants in order to be deemed informed. Less than two thirds of the respondents in this survey cite four or more newborn danger indications, whereas more than two thirds do not mention danger signs. Participants in the study had a mean score of 24.28 for general knowledge, and a mean score of 33.83 for practice.

Thermal Practice	Response	Frequency	Percent
Check that sterile glove put on during cord care.	10(3%)	50(17%)	220(78%)
Check that during delivery, clean apron worn.	67(23%)	103(36%)	110(39%)
Check that during delivery, clean mask worn.	04(1%)	65(23%)	211(75%)
Before the procedure, make sure to wash your hands with soap and water to prepare for childbirth and newborn care.	04(1%)	50(17%)	226(80%)
With a swab soaked in sterile water and different swab for each eye, Check that the eyes are clean as soon as possible after birth from the medial to lateral side	210(75%)	35(12%)	35(12%)
Wait 2- 3 minutes after the birth or until the cord pulsation stopped before checking the cord clamp on a wailing newborn.	126(45%)	67(23%)	87(32.0%)
To cut the cord Make sure to use Sterile Scissors.	0(0%)	30(10%)	250(89%)
Make sure to take care of the cord care by washing it and allowing it air dry.	50(17%)	110(39%)	120(42%)
Verify that the mothers and caregivers wash their hands before handling the newborn.	150(53%)	110(39%)	20(7%)
Verify that within one hour of birth, newborn babies should be given eye ointment.	23(8%)	107(38%)	150(53%)
With the tip of the finger, ensure that eye ointment was applied without touching the eyes	16(5%)	106(37%)	158(56%)
The baby's weight should be verified and recorded.	0(0%)	12(4%)	268(95%)

**Table 4:** Practice of cord care and infection prevention (n=280)

## DISCUSSION

This study evaluates the nurse's expertise of newborn care in Tertiary Care Hospitals of Bahawalpur. Education for nurses is often recognized as a critical method for promoting their expertise, and Kruk et al., discussed in study where 47.8 % and 48.9% of the participants had poor level of knowledge and poor level of practice respectively [6]. Ayele et al., found that it is more expensive than Egypt, Uganda, and India. Thus, there is a critical need to improve practice through ongoing education and relevant training, and especially for nurses this is so important, because they serve as first line of treatment to mothers and children whose lives they are attempting to save [7]. This study revealed that only 53 % of women gave eye ointment to all of the babies they delivered, 38% did it only for certain kids, and 78% knew the necessary vitamin K dose for preterm babies is 0.5mg, but only 21 % gave it at all [8]. This is congruent with findings from studies done in Egypt, where the results were greater than those from Uganda but lower than those from the Philippines. According to this, rather than a lack of expertise, the aforesaid discrepancy between how Vitamin K and eye ointment are administered in the study area and in the Philippines may be the result of different drug availability [9]. Delaying nursing after birth reduces the chances that moms and babies would benefit from early initiation while also increasing the danger of hypothermia and hypoglycemia. Initiation of breastfeeding should begin within the first few hours of delivery, according to 245 of the study's participants, and more than 3/4 were aware that colostrum plays an important role in a newborn's ability to fight infections [10]. The remaining 50 participants (17%) were unaware of these facts. 245 (87.0%) of the participants were aware that a mother should breastfeed their child exclusively for the first six months when asked about exclusive breastfeeding. Comparing this to studies done in Ethiopia, Tanzania, and MAISHA, this

difference is enormous [11]. It's crucial for newborns to have thermal protection. Because it can avoid the side effect of hypothermia. Regarding thermal protection, 220 (78 %) of the participants dried all of the infants with a dry towel, while 60 (20 %) only did so for some of the infants. A total of 210 (75 %) of the respondents kept all of their newborns on their mothers' bellies right away, while 70 (24%) of them did not [12]. A total of 165 (58%) of the respondents discarded wet towels and covered all of their newborns with dry towels, while 115 (40%) only did so for some of the infants. The research conducted in Khartoum is congruent with this. However, this study's quality is not as high as Tanzania's [13]. In order to stop early neonatal infections, clean cord care is crucial. The umbilical cord should be clamped and cut at precisely the right time since there is some evidence that the newborn may benefit if the cord is not clamped and cut right away after birth [14]. Regarding cord care, in this study 87 (32.0%) people waited 2-3 minutes after birth to clamp the umbilical cord of any crying infants, whereas 193 (68%) people did so immediately or in less than 2 minutes. Mersha et al., found that when compared to Tanzania, this is lower [15]. However, nurses need to be up to date on current events in order to make evidence-based practice a more consistent reality. Notably, De-Graft et al., found that study's nurses lacked adequate training and experience in the care of neonates. For the survival and future well-being of the neonates, nurses' understanding of neonatal danger indicators is crucial [16]. A minimum of four of the usual 11 danger signs had to be recognized by participants in order to be deemed informed. Less than two thirds of the respondents in this survey cite four or more newborn danger indications, whereas more than two thirds do not mention danger signs [17]. It would seem obvious that nurses would require continual education and training in newborn care in order to decrease neonatal death and morbidity. When caring for the newborn baby, nurses with

more knowledge were skilled in their practical fields [18]. A weekly focus on one component of care, Posters, and other techniques to reinforce and maintain better care over time could be used as additional teaching or educational initiatives [19]. This involves attempting to increase nurses' motivation by providing encouraging feedback about their practice improvements in meetings [20].

## CONCLUSIONS

This was the first study of its kind in Bahawalpur, in improving nurses' capacity to learn more about and practice providing care for babies. To maintain knowledge and competency in Practice, though, requires ongoing instruction and coaching because generally participants had good knowledge and practice, while on some aspects of essential nursing care they had poor knowledge and practice. The research population lacked information in several resuscitation-related areas, practiced poor infection control, administered Vitamin K and eye ointment seldom, knew nothing about the specific cord clamping time that may cause newborn anemia, and was largely unaware of neonatal danger symptoms. The majority of the study population had good awareness of and experience with heat protection as well as good practice with prompt breast-feeding initiation.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Analysis of Semen Patterns in Male Partner of Infertile Couples

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## ARTICLE INFO

## Key Words:

Asthenospermia, Oligoasthenozoospermia, Azoospermia, Primary Infertility

## How to Cite:

 Tufail, N. ., Bano, N. ., Ali, S. ., Wahab Salman, N. ., Mustafa Jadoon, S. ., & Ghafoor, N. (2022). Analysis of Semen Patterns in Male Partner of Infertile Couples: Semen analysis and male infertility. *Pakistan Journal of Health Sciences*, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.322>

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Received Date: 5<sup>th</sup> November, 2022Acceptance Date: 13<sup>th</sup> November, 2022Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

The 40-50% infertility cases are reported to be because of the male partner. For the accurate investigation of the cause of infertility in couples, the semen analysis is considered as the effective and fundamental tool. It not only assesses the sperm maturity and formation, but also provide with the insights into the quality and production of sperm. **Objectives:** To analyze the semen pattern of the infertile male. **Methods:** It was a retrospective study conducted at the Gynecology and Obstetrician department of Khawaja Muhammad Safdar Medical College, Allama Iqbal Memorial Teaching Hospital Sialkot. The study was carried out by collecting data from male infertile patients that visited tertiary care unit for a duration of six months from July 2021 to December 2021. All participants were fully aware of the objective of the study; as written consent was taken from them. The abnormal features of semen were analyzed. The various features of oligozoospermia and normospermia were studied and it was found. **Results:** A total of 260 individuals participated in this study, among them there were 204 that had primary infertility issues and 56 had secondary infertility issues. There were just 2 infertile male partners that were greater than 50 years of age. It was found that there were 56% partners that had normozoospermia and 39% infertile partners having asthenozoospermia, then it was followed by azoospermia condition which was seen in 28% patients. **Conclusions:** It was found that the asthenospermia, oligoasthenozoospermia and azoospermia are some of the contributors of male infertility.

## INTRODUCTION

The infertility is defined as inability to conceive even after one year of regular and unprotected intercourse. The 8-12% couple in the world are experiencing the infertility issues. The male partner contributes to more infertility cases than female. The 40-50% infertility cases are reported to be because of the male partner. Infertility is a global concern. It incidence varies globally with the geography and other parameters [1, 2]. Asthenozoospermia is defined as the infertility condition in which the sperm motility reduced to less than 40%. The progressive motility also reduced to less than 30%. Asthenozoospermia cases observed to be more sensitive in the nations with patriarchal societies. Different

psychological and physical problems are associated with the infertility [3, 4]. It is common in both developing and developed nations. But the more social and physical problems are associated with infertility in the developing nations. The term oligoasthenozoospermia is defined as the decreased percentage of the motile spermatozoa in the sperm samples. It is the types of sperm disorder that effects both sperm count and sperm motility. It is common observation that in the middle-income countries the female partner are blamed of the infertility, and the male being superior usually don't underwent through evaluation and tests. The infertility condition in which there is no measurable sperm count in male semen is termed as

azoospermia. The hormonal imbalance and blockage along the reproductive tract can lead to azoospermia. The less severe form of the azoospermia is defined as oligozoospermia. The sperm count reduced to less than 15 million sperms per ml. If the spermatozoa with the abnormal morphology are present in the sperm sample the condition is defined as teratozoospermia. The reactive oxygen species ROS and DNA fragmentation are considered as the sperm damage marker that are the cause of the teratozoospermia. The condition in which semen sample has all disorder such as low sperm count known as oligozoospermia, the abnormal morphology known as teratozoospermia and the poor motility known as asthenozoospermia, this condition is normally named as oligoasthenoteratozoospermia. In the infertility couple the semen analysis is an indispensable evaluation. In order to assess the male infertility the semen analysis is considered as a standard technique [5-7]. The type of semen analysis in which the values of all ejaculates parameters are observed to be normal is defined as normospermia. The infertility condition in which semen (ejaculate) volume are measured to be lesser than 1.5ml is defined as hypospermia. If the semen volume produced during ejaculation are larger than 2.5ml the infertility condition is known as hyperspermia. For managing the male factors infertility, the semen parameter interpretation can be proved to be the effective tool. It is a standard line investigation. In order to determine the functional parameters of the ova and spermatozoa there is need to determine the sperms parameters. The exact etiology of the male infertility is not properly understood in most of the cases. The sexual dysfunction and sexually transmitted diseases are the factors associated with the male infertility. The study aimed to analyze the abnormal semen analysis pattern in the infertile couples. For the accurate investigation of the cause of infertility in couples, the semen analysis is considered as the effective and fundamental tool [8, 9]. It not only assess the sperm maturity and formation, but also provide with the insights into the quality and production of sperm. It is a sensitive test with the approximately 90% sensitivity. It can detect every 9 out of the 10 men with the infertility issues. The abnormality in the sperm production control mechanism at testicular level can lead to the decreased sperm count. The low sperm count levels and the poor quality of the semen are the two factors that accounts for the approximately 90% cases of male infertility. The increasing prevalence of the sexually transmitted diseases are ultimately effecting the quantity and quality of the semen. The oligospermia incidence are reported to be 21% while incidence of the azoospermia is 13%. The scarce and limited data is available about the male infertility, its incidence and different parameters effecting

the fertility of the male [10]. Therefore the study was conducted to evaluate the semen parameters of the infertile couples.

## METHODS

It was a retrospective study conducted at the Gynecology and Obstetrician department of Khawaja Muhammad Safdar Medical College, Allama Iqbal Memorial Teaching Hospital Sialkot. The study was carried out by collecting data from male infertile patients that visited tertiary care unit for a duration of six months. All participants were fully aware of the objective of the study; as written consent was taken from them. The abnormal features of semen were analyzed. The various features of oligozoospermia and normospermia were studied. The institution ethical and review board committee approved the study. According to inclusion criteria, followings infertile males were selected for the study;

- . The couples who visited the hospital for infertility problems.
- . The couple experiencing infertility from more than 1.5 years.

The semen sample were collected from the infertile male. The sample were stored in the plastic container and semen analysis was performed in accordance to the methodology and guideline provided by the WHO. The sample was delivered to the lab of the institute within the one hour of the collection where these sample were processed further. The sperm quality and quantity including the motility, concentration and morphology was assessed. The data was collected from the infertile couple's male partner who attended the hospital. The data was recorded by using Microsoft word and excel than the SPSS software was used for the stratification of the data. The confidence interval of 95% was taken. The t-test was performed for the comparison of the data. The results were depicted in the percentage, mean and frequency.

## RESULTS

The study was carried out by collecting data from male infertile patients. The primary infertility is defined as condition in which the women failed to conceive even the first child. Whereas as the secondary infertility is defined as the condition in which the women conceived for the first time but failed to conceive the second child. The 260 individuals selected for the study, out of them 204 that had primary infertility issues and 56 had secondary infertility issues as shown in table 1.

Features		N (%)
Infertility kinds	Primary infertility	204 (78%)
	Secondary infertility	56 (21%)

**Table 1:** Demographic features of infertile male n=260



There were 145 individuals that were between 20-30 age group and only four of them were below 20 age group. There were just 2 infertile male partners that were greater than 50 years of age as shown in table 2.

Age in years	N (%)
Less than 20	4 (1.5%)
20-30	145 (55%)
30-40	100 (38%)
40-50	10 (3.8%)
Greater than 50	2 (0.6%)

**Table 2:** Age distribution chart

The abnormal features of semen were analyzed and it was found that there were 56% partners that had normozoospermia and 39% infertile partners having asthenozoospermia, then it was followed by azoospermia condition which was seen in 28% patients. oligoasthenozoospermia was found in 17% individuals as shown in table 3. The 4 individuals were included in oligoasthenoteratozoospermia category as shown in table 3.

Semen irregularities	N (%)
Asthenozoospermia	45 (39%)
Azoospermia	33 (28%)
Oligoasthenozoospermia	20 (17%)
Oligozoospermia	10 (8%)
Oligoasthenoteratozoospermia	4 (3%)
Teratozoospermia	2 (1.7%)

**Table 3:** Analysis of irregular semen features

The various features of oligozoospermia and normospermia were studied and it was found that the features like age of patient, progressive and total immotility and total count values were significant. However, there was no statistically significant difference found between volume of both groups.

	Normospermia	Oligospermia	p-value
	Mean $\pm$ SD (95%CI)	Mean $\pm$ SD (95%CI)	
Volume	2.4 $\pm$ 0.8 (2.4-2.7)	2.4 $\pm$ 1.1 (2.2-2.7)	0.33
Total count	45 $\pm$ 22 (45-48)	7.1 $\pm$ 3.9 (6.2-8)	0.00
Progressive motility	46 $\pm$ 24 (44.2-50)	19.2 $\pm$ 22.1 (13-23.4)	0.00
Immotility	31 $\pm$ 21.3 (32.1-5.4)	54.3 $\pm$ 23.4 (48-68)	0.00
Age	31 $\pm$ 5.3 (28.3-29)	28.6 $\pm$ 4.5 (28.2-31.1)	0.03

**Table 4:** Comparing the semen parameters between oligozoospermia and normozoospermia

## DISCUSSION

In this study the primary infertility was found in 78% individuals. As per a previous study carried out 88% men suffered from primary infertility and only 11% had

secondary infertility issues [11]. But another study demonstrates that secondary infertility was dominant among their study group where 58% infertile partners have secondary infertility issues [12]. In this study it was reported that there were 44% patients having similar abnormalities like the abnormality called as asthenozoospermia. It was found among 39% male patients and 28% suffered from azoospermia. Oligoasthenozoospermia was reported among 17% cases. as per a study carried out to find the types of infertility issues among infertile male partners it was found that majority of the cases had asthenozoospermia abnormality (27%), it was then followed by oligozoospermia which was observed among 6% cases. In our study azoospermia was found in 28% individuals but this value is greater than the data reported by previous studies, where azoospermia was 14%, however another study shows that azoospermia was found in 38% infertile partners [13-15]. As per studies, sperm count is not the only issue responsible for male infertility there are other features as well like in case of azoospermia there is damage to the male reproductive tract or there is defective sperm production [16]. Some other features that can be the reason for male infertility are semen viscosity, the volume of semen, the morphology and the motility [17]. The average sperm concentration in case of normozoospermia is 45 $\pm$ 22 whereas in oligozoospermia it is 7.1 $\pm$ 3.9. The progressive motility in normozoospermia is 46 $\pm$ 24, and in oligozoospermia it is 19.2 $\pm$ 22.1. Both of these findings are in accordance with the previous results [18]. All the data was collected by fulfilling the major criteria of WHO and sterile containers the analysis was done by the department of pathology where WHO designed parameters were used for laboratory examinations. Similar procedures are used by other studies as well. The features like viscosity, concentration, volume and motility were measured. As per some studies, male partners usually hesitate to get their infertility check-up as compared to the female partners [19]. There were few patients that were reluctant for sample collection. Most of the cases belonged to normozoospermia and the cause of infertility could be any other issue related to semen like viscosity, volume, count etc. The ejaculated volume of semen in case of oligozoospermia and normozoospermia came out to be 2.4 $\pm$ 1.1 and 2.4 $\pm$ 0.8 respectively. The semen volume came out to be normal in both of these group. There was no major difference in volume of semen was observed in oligozoospermia and normozoospermia. Progressive motility and total count is however very less in case of oligozoospermia as compared to normozoospermia. In a study carried out to find the semen related abnormalities in infertile male partners it was found that the semen volume remains normal in normozoospermia and oligozoospermia

cases [20]. Among the cases reported in this study there were 90% male partners that had normozoospermia and only 7% suffered from hypospermia with 1% having hyperspermia. As per a study the ethnicity factor was also studied to find if there exist any relation between ethnicity and semen related abnormalities, it was found that Brahmin-chhetri group had the most of the semen related abnormalities however, there was no significant association found between ethnicity and semen abnormalities [21]. Primary and secondary both kinds of procedures and techniques were used by pathology department to check all the parameters of samples. In our study the male infertility related to semen abnormalities are studied but there was no analysis done to find the cause of possible infertility. Further study is required to explain how the semen related abnormality can play its role in causing infertility and also about the cause of emergence of these abnormalities.

## CONCLUSIONS

The study was conducted to find the semen analysis pattern of the infertile male partners it was found that the asthenospermia, oligoasthenozoospermia and azoospermia are some of the contributors of male infertility. Azoospermia was related to damage of male reproductive tract leading to infertility. In some cases, there was defective and abnormal production of sperms. In most of the patients there are normozoospermia followed by hypospermia and hyperspermia. The features like viscosity, count, concentration/volume of semen also play role in contributing to infertility.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Assessment of Nutritional Status and Dietary Practices Among School-Going Adolescents in Rural and Urban Area: A Comparative Study

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## ARTICLE INFO

**Key Words:**

Nutritional Status, School Going Adolescents, Urban, Rural

**How to Cite:**

Zainab, Y. ., Noreen, S. ., Rizwan, B. ., Ume Farwa, S. ., Abbas, W. ., Naveed, J. ., Tariq, A. ., Babar, S. ., & Ali, M. . (2022). Assessment of Nutritional Status and Dietary Practices Among School-Going Adolescents in Rural and Urban Area: A Comparative Study: Assessment of dietary practices among school-going adolescents. *Pakistan Journal of Health Sciences*, 3(06).

<https://doi.org/10.54393/pjhs.v3i06.148>

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Received Date: 22<sup>nd</sup> September, 2022

Acceptance Date: 18<sup>th</sup> November, 2022

Published Date 30<sup>th</sup> November, 2022

## ABSTRACT

The nutritional status of adolescents is of utmost importance as this stage of life accounts for the massive growth and maturation of the human body. Substandard nutritional status during adolescence is a significant determinant of health outcomes later in life. **Objectives:** To assess and compare the nutritional status and dietary habits of school-going adolescents in rural and urban areas. **Methods:** A cross-sectional study was conducted to assess the nutritional status of adolescents from different schools in rural and urban areas. A total of 100 participants were selected through the non-probability sampling technique. Participants were assessed using a standardized questionnaire that included a food frequency questionnaire (FFQ), socio-demographic, nutritional knowledge and eating habits. Data was then entered and analyzed using SPSS version 24.0. Among 100 participants, 50 were male, and 50 were female. All-inclusive participants were between 14–17 years of age. **Results:** In rural areas, 40% of the students were underweight, whereas, in urban areas, only 26% were underweight. However, the percentage of normal body mass index was equal. The prevalence of the overweight category was two times greater in urban areas, 16%, compared to 8% in the rural area. Mostly urban area students consumed more junk rather than natural foods and homemade foods, which were more common among rural students. Comparatively, rural students were more undernourished and leaner. **Conclusion:** Nutritional status of students from both areas was different from each other by a considerable margin but collectively was insufficient and poor.

## INTRODUCTION

Adolescence is the time covering the ages of 10-19 years and is the most crucial time of development as it highlights the changeover from life as a child to life as an adult. Dietary habits imperatively affect lifetime nutritional status and wellbeing during this critical period of growth [1]. During adolescence, 20% of final adult height and 50% of adult weight are attained, and bone mass also increases by 45%. Healthy eating patterns – eating a variety of balanced, nutritious foods and drinks have an important impact on the health, growth, and mental development of an adolescent and can also prevent them from diseases and

health problems in later life [2, 3]. The crucial nutritional issues include undernutrition – stunting, wasting and overnutrition, and obesity, causing double burden malnutrition among school-going adolescents. Around the globe, 10% of adolescents are overweight, with an increasing prevalence of obesity ranging from 2 to 3% [4]. Consumption pattern is a determinant of nutrition likely to be influenced by changing demographics between urban and rural areas. The foremost causes for this perforation are the socioeconomic discrepancies between these areas, for example, occupation, income, and education

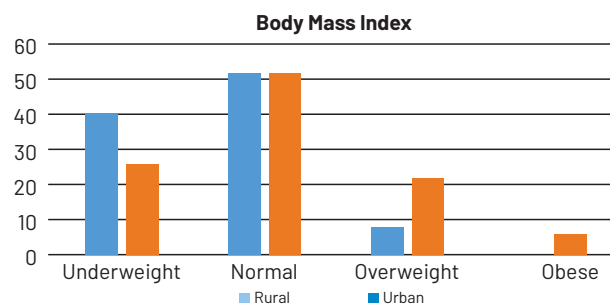
levels [5]. The variation between the environments of these areas also plays a significant role in forming food consumption patterns in the community. Accordingly, those populations are probably to have different food choices, which might impact their consumption patterns [6]. The prevalence rate of obesity among school-going students is higher in urban areas than students in rural areas [7]. Students of age 6-16 years in urban areas were consuming more proteins and fats than students in rural areas. In rural areas, they had a low intake of fat and oil-rich foods, a higher intake of staple foods, and consuming plant-based proteins than animal-based products [8]. According to a study, the overall nutritional status and dietary habits of adolescents in Pakistan were not satisfactory [9]. Anthropometric measurements are the most frequently used means for the appraisal of the nutritional status of a population. Generally, 3 anthropometric indicators are used to evaluate the nutritional status of adolescents, i.e., underweight, stunting and leanness [10]. In our community, adolescents are mostly neglected; moreover, a lack of data suggests dietary patterns and habits conducted among urban and rural regions of Pakistan. Hence our study aims at comparing the dietary habits and nutritional status of school-going adolescents in urban and rural areas. The present study attempts to examine the effect of socioeconomic differences on students eating habits and overall health status. This study will help create awareness regarding healthy dietary practices and improve the nutritional status of school-going adolescents in both rural and urban areas.

## METHODS

A cross-sectional study which is conducted for the time duration of 4 months in three different schools, such as Roots International School EME branch, Government Liaquat Boys High School, and Government Fatima Jinnah Girls High School. A total of 100 students in class 9th and 10th were taken by using the non-probability sampling technique, and data was collected through a standardized questionnaire. Data were then entered and analyzed using SPSS version 24.0.

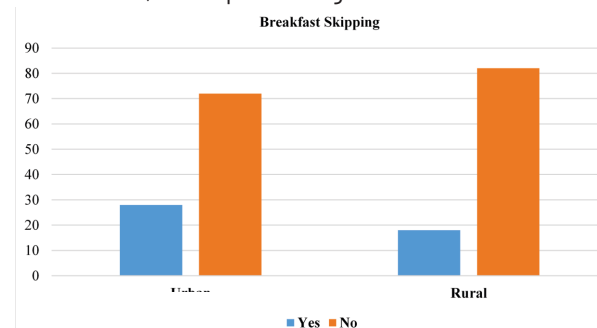
## RESULTS

The results showed that 40% of students in rural areas were underweight while 26% of students in urban were underweight. Most students fall under the normal BMI category from rural and urban areas. In the urban area, 22% of students fall in the category of overweight and obese, whereas only 8% are from the rural area. No obese student was found in rural areas, but 6% of students were obese in urban areas. This result shows that participants from urban areas are more at risk of obesity (Figure 1).



**Figure 1:** Frequency Distribution of Body Mass Index

According to figure 2, representing meal skipping shows that breakfast skipping was more in urban students than rural students, with a percentage of 28% and 18%



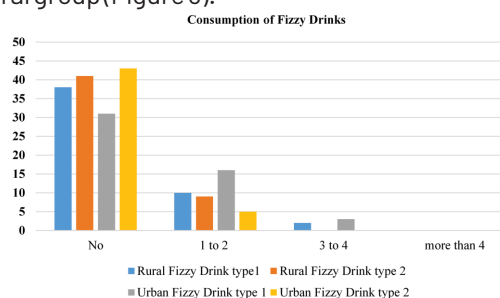
**Figure 2:** Distribution of Breakfast Skipping among Participants

Table 1 shows a significant correlation between the consumption of packaged fruit juices in rural and urban areas, with a p-value <0.05 representing a higher consumption of packaged juices in urban areas.

Area	Consumption of Packaged Juice				Total	p-Value
	No	1-2 cup	3-4cup	more than 4		
Rural	38	8	4	0	50	0.016
Urban	23	14	12	0	50	
Total	61	22	16	1	100	

**Table 1:** Association between Consumption of Packaged Juices and area

Fizzy drinks were mostly consumed in both groups, with 41% drinking 1-2 cups on a daily basis. However, the ratio of consumption was higher in urban groups. 5% out of these 26% consumed 3-4 cups of fizzy drinks daily. Apart from fizzy drinks, 12% of students mentioned other drinks in which 'carbonated energy drink' was the most consumed by the rural group (Figure 3).



**Figure 3:** Frequency Distribution of Fizzy Drink Consumption

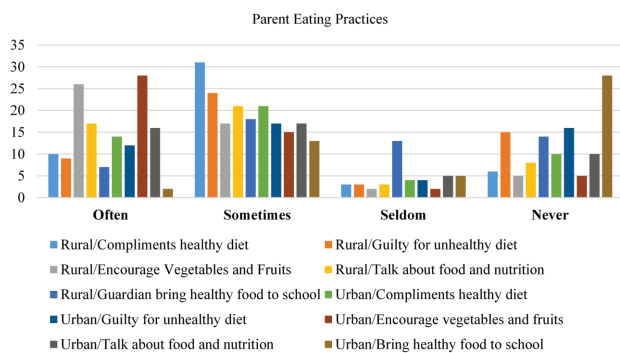
among school-going Adolescents

In finding the preference of homemade and junk food, the results depict that 57% preferred homemade food and 43% preferred junk food. However, the participants who mostly favored homemade foods belonged to the rural group, and consequently, students of urban areas were a higher frequency of favoring junk food. The results also showed that a higher number of boys preferred homemade foods as compared to girls (Table 2).

Preference for Food	Total	Rural	Urban
Homemade Foods	57%	36	41
Junk Foods	43%	14	29
Total	100%	77	43

**Table 2:** Distribution of Preference for Food

According to figure 4, in rural areas, parents eating practices towards their children account for 31% of those who commend, whereas, in urban areas, the ratio is only 21%. On the other hand, children in rural areas are pestered by their parents at a rate of 23%, compared to 18% in urban areas. Aside from that, neither group differs in terms of encouraging children to consume fruits and vegetables. In both groups, the percentage of time spent discussing healthy eating habits is nearly identical. Both groups of children were equally questioned by their parents.



**Figure 4:** Frequency Distribution of Parent Eating Practices

## DISCUSSION

In this study, among 100 participants majority of the students belonging to the rural areas were under-weight (40%), whereas the ratio of normal BMI in both the areas was the same (52%). Consequently, the prevalence of obesity was only seen in urban areas accounting for 6% of the whole urban population. Relatively, the percentage of the overweight category was two times greater in urban (16%) compared to rural (8%). Similarly, a study conducted by Sedibe et al., 2018 found out that under-weight students were predominantly present in rural areas accounting for (18.8%) as compared to only (2.7%) of the urban students. Likewise, the frequency of being underweight in rural areas was higher compared to urban areas, and the percentage of overweight students was higher in urban areas. Breakfast was mostly skipped by urban students than rural

students. They found out that more than 60% of the adolescent sample size consumed breakfast regularly in both urban and rural areas [11]. According to our research, there is no big difference in which parents encourages their child to eat fruits and vegetables in both rural and urban areas, on the other hand, a comparative study by Hoffmann, both the rural and the urban both have the same percentage of encouragement to eat fruits and vegetables [12]. In a similar study conducted by Bargita et al., 2013 showed that 93% of adolescents parents controlled their food choices leading them to opt for more vegetables and fruits. According to our study, the students of urban areas were not interested in eating healthy food; our results found out that the students of rural areas were more interested in eating a healthy diet and comparatively in other studies found out that rural students proved that are more interested in eating or managing a healthy diet as compared to urban students adults had the most higher rate of eating fresh foods rather than eating processed foods in rural areas but the urban areas had the poorest diet [13]. Consumption of fruit juices was equal with respect to rural and urban areas, and a total of 74 students consumed fruit juices. The percentage of those consuming fresh fruit juices daily was higher in urban. In comparison, a study conducted by Xavier et al., 2014 found that rural students consumed more natural juices daily [14], whereas urban students mostly consumed soda drinks. Another study conducted by Miller et al., 2020 found out that of the multitude of packaged drinks evaluated, utilization of fruit juice was the most common [15]. Similarly, in our study, the ratio of consumption of soda drinks was similar in both the groups; however, coke consumption was higher in the urban group and sprite was consumed mainly by the rural group. In another study conducted in Old Indonesia by Esti Nutwanti showed that the consumption of sweetened and carbonated drinks was higher in urban areas as compared to rural areas [16]. A total of 57% of the total population preferred homemade foods in our study; comparatively, a study conducted by Lipoeto et al., 2013 in Philippines found out that traditional and customary food choices were still kept up with large portion of population, however they did infuse a few changes in the recipe [17]. In another study conducted by Saxena, A in 2017 on female adolescents found out that junk food was one of the top priorities among teenagers, with a very high percentage (about 80%), 40 out of 50, consuming junk roughly four times each week, indicating an unhealthy trend [18]. In our study's results, the carbonated drink consumption rate is not very high. Only 25% of students were drinking cold drinks a maximum of 3 times per week; as compared to other studies of West Bengal, India, the intake of carbonated beverages was low, maybe because of economic status [19]. However, another

study conducted by Yang et al., 2017 showed that young adolescents reported drinking carbonated soft drinks at least once a day. These findings show that young adolescents consume a lot of carbonated soft drinks [20].

## CONCLUSIONS

Hence the study represents that adolescents in either rural or urban areas were at risk of being malnourished. The urban area had a higher percentage of overweight and obese category students, whereas rural students were mostly undernourished. However, urban students consumed more junk food among the participants whereas rural students consumed homemade and natural foods. In contrast, the consumption of fizzy carbonated beverages consumed by students, irrespective of the area. Nonetheless, carbonated beverage consumption by urban students was slightly more than among rural students. Healthy diet knowledge was also more evident among urban students.

## Conflicts of Interest

The authors declare no conflict of interest.

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Assessment of Secondary Traumatic Stress in Health Care Professionals Working in Tertiary Care Hospitals of Islamabad

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## ARTICLE INFO

**Key Words:**

Healthcare professionals, Secondary traumatic stress, Emergency department, Pakistan

**How to Cite:**

Chaudhry, M., Sharif, H., Masaood Shah, S., Javed, S., & Mangrio, S. (2022). Assessment of Secondary Traumatic Stress in Health Care Professionals Working in Tertiary Care Hospitals of Islamabad : Assessment of Secondary Traumatic Stress in Health Care Professionals. *Pakistan Journal of Health Sciences*, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.270>

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Received Date: 19th October, 2022

Acceptance Date: 8th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

Health care professionals are at a higher risk of developing secondary traumatic stress due to various factors related to the nature of their job. **Objectives:** To assess the level, severity & factors associated with secondary traumatic stress symptoms among health care professionals working with trauma victims in tertiary care hospitals of Islamabad. **Methods:** A cross-sectional study was carried out in which 170 healthcare professionals participated from both public and private tertiary care hospitals of Islamabad. Data were collected by using STS Scale, TIPI and demographics. Analyses was done using independent t-test, ANOVA and Pearson's Correlation Coefficient. **Results:** The results showed, 94(55.3%) and 71(41.7 %) little and mild to moderate level of STS in healthcare professionals respectively. Female gender was significantly associated with STS ( $p = 0.01$ ) along with MBBS graduates ( $p = 0.02$ ) and junior doctors ( $p = 0.01$ ) showed symptoms of STS. Those who were exposed to trauma multiple times had significant association STS. Emotionally stable personality trait of the healthcare professionals had an indirect relation with the development STS symptoms ( $r = -0.46$ ). **Conclusions:** The results emphasized hospital administration to take measures in order to reduce stress level especially among female HCWs, junior doctors and those who had multiple exposure of trauma. If necessary steps are not taken, this stress may lead to worse mental health of this target population

## INTRODUCTION

Secondary traumatic stress (STS) is a condition that develops as a result of a traumatic event that has been experienced by someone other than the person suffering from trauma [1]. STS a term that gained its recognition by Charles Figley; which has a meaning of stress that occurs by helping others suffering from trauma. A social, psychological and emotional response as a result of understanding the other individual's traumatic experiences [2]. Health care professionals are at a higher risk of developing secondary traumatic stress due to various factors related to the nature of their job, one of the most important factors is dealing with patients who are suffering from trauma; other factors include job

dissatisfaction, long working hours, often working over the hours, loss of personal and social life. This eventually leads to a state where psychological burden coupled with poor decision-making leads to unintentional ethical and medical errors [3]. The emotional, physical and mental exhaustion of healthcare professionals has negative repercussions on their ability to work efficiently. As the work of a health professional is directly concerned with the lives of their patients it adds more to the already negative outcomes of their psychological state [4]. Compassion fatigue another term that has a similar meaning as that of STS. Where former term especially affects the feeling of empathy towards the patients' ailments and other conditions [5]. As

per a study it is suggested that 16% to 85% health care workers working in different clinical areas, might develop secondary traumatic stress symptoms [6]. Levels of secondary trauma exposure and perceptions of trauma resolution were positively related to STS [1]. Out of 87 Portuguese nurses ,59% were found to have a high level of STS [7]. 72% of the doctors were found higher level of STS [8]. In Australia 91% of the physicians' trainees were found to have higher level of STS [9]. 77.6% of the Nepalese doctors were found to have STS [10]. A study conducted in Pakistan showed 65.4% of healthcare professionals had moderate level of compassion fatigue [11]. As the current situation worldwide is suggestive of more trauma victims' influx in emergency departments and trauma units, health care professionals are at the risk of developing secondary traumatic stress symptoms more often than it used to be. Pakistan has literature gap, as there is no such study performed specially on healthcare professionals that are employed in trauma units and the prevalence of STS symptoms among them. The purpose of this study is to address the neglected issue of STS in health professionals in Pakistan; its prevalence, associated factors and ultimate consequences. That will help in making workplace policies and interventions can be recommended for this issue. The aim of this study was to assess the level of STS and identify the factors associated with STS among HCP working with trauma victims in tertiary care hospitals of Islamabad.3

## METHODS

A cross-section study design was carried out in emergency departments of Tertiary Care Hospitals of Islamabad over a period of six months from December 2021 to May 2022. Sample size was calculated after taking the total population of emergency respondents from each of the selected hospital, with 50% proportion and 5% non-response rate a total of 170. HCP who met inclusion criteria, were conveniently included in this study. Data were collected by questionnaire which consisted of socio-demographic information of the HCP and two internationally validated tools of Ten Item Personality Trait Inventory and Secondary Traumatic Stress Scale. A total score below 28 corresponded to "little or no STS," a score between 28 and 37 means "mild STS," between 38 and 43 "moderate STS," between 44 and 48 "high STS," and beyond 49 "severe STS" [12]. The IBM SPSS, version 26.0 was used to verify the obtained data. The data analysis was divided into three stages. First descriptive analyses were run for socio-demographics variables which included frequencies and percentages. In second stage independent sample t-test and ANOVA were run for association of socio-demographics variables with the STSS. In the third phase Pearson's Correlation was applied to ten item personality traits to the STSS. P value more than 0.05 is considered

significant.

## RESULTS

The demographic characteristics of the samples are presented in Table 1. More than half of the respondent were female. Majority of respondents were medical officer and House Officer 64(37.4%).

Demographic Characteristics	Category	No. of Respondents (%)
Gender	Male	80 (47.1%)
	Female	90 (52.9%)
Marital Status	Married	67 (39.4%)
	Unmarried	103 (60%)
Education	MBBS	101 (59.4%)
	BSN	66 (38.8%)
	Post-Graduate	3 (1.3%)
Designation	Medical & House Officer	64 (37.6%)
	Nurse	67 (39.4%)
	Post-Graduate Trainee	33 (19.4%)
	Consultant	6 (3.5%)
Birth Order	First Child	44 (25.9%)
	Middle Child	82 (48.2%)
	Last Child	40 (23.5%)
	Only Child	4 (2.4%)
Work Shift	Day Shift	34 (20%)
	Night Shift	1 (0.6%)
	Rotating	133 (98.8%)
Directly dealing with trauma patients	Yes	128 (75.3%)
	No	42 (24.7%)
Last time exposure /experience with trauma	Daily	35 (20.6%)
	Few days ago,	67 (39.4%)
	Month ago,	67 (39.4%)
	Never	1 (0.6%)
Work or personal trauma	Work	100 (58.8%)
	Personal	44 (25.9%)
	Both	25 (14.7%)
	None	1 (0.6%)
Frequency of trauma experience	Once	26 (15.3%)
	Daily	5 (2.9%)
	Multiple	138 (81.2%)
	None	1 (0.6%)

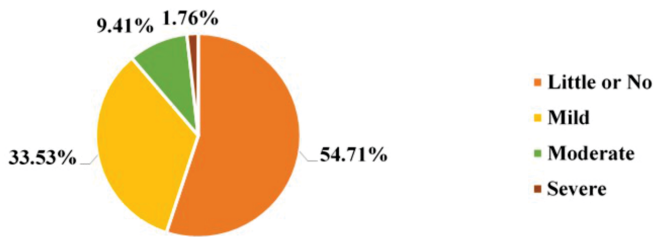
**Table 1:** Demographic Characteristics

The mean of ages of the participant are of 28.36±4.4 while 21 years being the minimum and 40 maximum age. Working hours of the participants have a mean of 9.11±1.88 while minimum working hours are 6 and maximum 12. The respondents were asked about their trauma related experience by five questions. Majority of the respondents dealt with trauma patient directly 128(75.3%). Regarding the trauma exposure of the respondents, 67(39.4%) were exposed to trauma few days and months ago. Majority of the respondents' trauma exposure work related 100(58.8%). Nearly 15% respondents were exposed to both work and personal trauma (Table 2).

Personality Trait	N	Mean ± SD
Extroversion	170	4.01 ± 1.3
Agreeableness	170	4.83 ± 1.0
Conscientiousness	170	5.17 ± 0.91
Emotional Stability	170	4.2 ± 1.2
Openness	170	4.8 ± 1.0

**Table 2:** Ten Item Personality Scale

The Secondary traumatic stress scale has a range of 51, with minimum score 0 and maximum 51, with a mean of 25.54±10.12. Study results showed that more than half respondents have little to no secondary traumatic stress (Figure 1).



**Figure 1:** Secondary Traumatic Stress categories

The significant factors associated with STS was gender, educational status, designation of the respondents and how many times these respondents experienced trauma ( $p < 0.05$ ). Details of associated factors is given in table 3.

Variables	N	Mean ± SD	Test Statistics (df)	p-Value
<b>Gender</b>				
Male	80	23 ± 1.1	2.557(168)	0.01*
Female	90	27 ± 1.1		
<b>Age</b>				
20-30 years	127	25 ± 9.4	1.186(168)	0.2
More than 30	43	27 ± 11		
<b>Working Hours</b>				
6-9 hours	120	25 ± 9.9	0.701(168)	0.4
More than 9 hours	50	26 ± 10.8		
<b>Marital Status</b>				
Unmarried	103	26 ± 10.3	1.712(168)	0.08
Married	67	23 ± 9.7		
<b>Dealing directly with trauma patients</b>				
Yes	128	25 ± 10.6	0.289(168)	0.7
No	42	25 ± 8.8		
<b>Educational Status</b>				
MBBS	101	26 ± 9.8	3.87(169)	0.02*
BSN	66	25 ± 10.1		
Post-Graduate	3	10 ± 9.6		
<b>Designation</b>				
Medical Officer/ House Officer	64	27 ± 9.5	3.73(169)	0.01*
Nurse	67	24 ± 10.1		
Post-Graduate Trainee	33	24 ± 9.9		
Consultant	6	14 ± 10.1		
<b>Birth Order</b>				
First Child	44	24 ± 9.2	0.30(169)	0.8
Middle Child	82	25 ± 10.2		

Last Child	40	26 ± 10.1		
Only Child	4	26 ± 17.7		
<b>Work Shift</b>				
Day shift	34	26 ± 9.4	0.60(167)	0.5
Night shift	1	36		
Rotating	133	25 ± 10		
<b>Last Exposed to Trauma</b>				
Daily	35	27 ± 7.7	1.06(169)	0.3
Few days ago,	67	25 ± 11		
Month ago,	67	24 ± 10		
Never	1	14		
<b>Trauma Relation</b>				
Work	100	25 ± 10	0.660(169)	0.5
Personal	44	24 ± 8.1		
Both	25	26 ± 10		
None	1	14		
<b>Times Trauma Experienced</b>				
Once	26	23 ± 11	3.08(169)	0.02*
Daily	5	15 ± 10		
Multiple	138	26 ± 9.6		
None	1	14		

**Table 3:** Associated Factors with Secondary Traumatic Stress

Correlation of STS with personality traits is given in table 4.

Correlated Factors	STS	Extroversion	Agreeableness	Conscientiousness	Emotional Stability	Openness
STS	1	0.03	-0.101	-0.08	-0.46**	-0.03
Extroversion		1	0.02	-0.07	-0.03	0.09
Agreeableness			1	0.59	0.15	0.18*
Conscientiousness				1	0.01	0.06
Emotional Stability					1	0.01
Openness						1

**Table 4:** Correlated Factors with STS

## DISCUSSION

Varying levels of secondary traumatic stress is present in health care professionals, especially those who have a direct dealing with the trauma victims. In the current study nearly half of the health care professionals had little to no symptoms of secondary traumatic stress. In Iran a similar study showed that half of the respondents who were providing professional care in emergency department and intensive care units were found to have mild- moderate level secondary traumatic stress [13]. Another study conducted in India showed that mild to moderate level of compassion fatigue was reported in majority of healthcare professionals working in different hospitals [14]. The present study showed the level of secondary traumatic stress in females was higher as compared to their male counterparts. In line with the current study, females were found to suffer more from emotional stress as compared to the males in Karachi [15]. In the current study, it was seen that doctors tend to suffer more from secondary traumatic stress as compared to the other healthcare professionals. Similarly, study conducted in China showed that, 73.6% of the doctors are shown to have suffer from emotional

exhaustion [16]. This study showed that doctors who were in the start of their professional career (House Officers and Medical Officers) were found to have more symptoms of secondary traumatic stress, which is in line with the previous study where higher rate of burnout was identified in young doctors in Hong Kong [17]. Contributing factors for the young doctors to demonstrate higher level of secondary traumatic stress include repeated night and weekend call duties, thorough documentation both manual and in electronic medical records, lesser time spent in home with family and a sub-conscious fear of malpractice and its consequences. This study revealed that health care professionals who experienced trauma multiple times showed symptoms of secondary traumatic stress. The reason behind this finding could be work environment of the health care professionals and that is the Emergency department. Emergency department of a tertiary care hospitals is often burdened with trauma patients. The result of this study was also confirmed by a Polish study where medical personals developed secondary traumatic stress due to poor coping skills while dealing with trauma victims [2]. Secondary traumatic stress can be affected by number of factors, one of that is the personality type of the individual. In this study the relationship of the personality trait of healthcare professional was assessed with the secondary traumatic stress. In the current study it was found that Emotional Stability of health care professionals was indirectly associated with secondary traumatic stress. The reason for this, could be the fact that emotional stable personality traits remain calm and stable. The emotional reaction of the individuals who exhibit emotional stability is less and do not get easily upset. A study conducted in Australia showed that health care providers who were found to be emotionally stable, showed more effective work engagement [18]. Similarly in China nurses who were found to be emotional stable showed gentle responses to work-related stressors and were found to have impulse control [19]. On the other hand, neurotic personality trait had a positive relation in the development of burnout, showed by a study conducted in Spain [7]. Another similar finding is a previous study where neuroticism was a positive predictor in the development of burnout in healthcare workers, in Greece [20].

## CONCLUSIONS

The results of this study were suggestive of that hospital administrations need to take measures to reduce the levels of stress especially among the female health care professionals, junior doctors and those who have experienced trauma multiple times. Emotional stability of the health care professionals should be evaluated before appointing in those departments where work-related stressors are known to be high.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The authors received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Assessment of the Level of Illness Perception Regarding General Health and Disease Severity Among Patients with Chronic Obstructive Pulmonary Disease

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## ARTICLE INFO

**Key Words:**

Perception, COPD, Health

**How to Cite:**

Saddique, H. S., Ali, A. ., & Aziz, Z. . (2022). Assessment of The Level of Illness Perception Regarding General Health And Severity Of Disease Among Patients With Chronic Obstructive Pulmonary Disease : Assessment of Perception Regarding Health and Disease. *Pakistan Journal of Health Sciences*, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.319>

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Received Date: 4<sup>th</sup> November, 2022Acceptance Date: 16<sup>th</sup> November, 2022Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

Chronic Obstructive Pulmonary Disease (COPD) is one of the critical health challenges among respiratory disorders worldwide. **Objectives:** To assess the level of illness perception about overall health and disease severity among patients with chronic obstructive pulmonary disease. **Methods:** This study was a descriptive and cross-sectional study. Data was collected through purposive sampling technique from 137 patients visiting the pulmonary department of public hospitals of Lahore, Pakistan. The data analysis was done through SPSS version 23. **Results:** The perception score was assessed through modified translated illness perception questionnaire (IPQ). The descriptive analysis was performed. Reliability and validity of the instruments was also ensured through meeting criteria of Cronbach Alpha, Bartlett's test of Sphericity and Kaiser-Meyer-Olkin (KMO) values. The results of this study showed that overall perception of the patients regarding COPD disease was quite low as 72 (52.6%) of the total participants scored low in perception and 65 (47.4%) participants had good perception. **Conclusions:** The current study concluded that the perception related to health and disease is playing an important role in management of chronic illness. The study results showed the overall perception of the patient is poor which might be the reason of their anxiety and depression that ultimately leads to flare up attack more frequently, and they need to visit more often. So, there is a need to enhance patient's understanding about their illness by giving them knowledge along with treatment that will change their perception regarding the course of illness and their perception regarding their health. It will also help patients in dealing with their symptoms at home.

## INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) affects over a million of population, and ultimately thousands of people die every year with this disease [1]. This leads to billions of health care cost annually [2]. Moreover, it compromises the quality of life of the patients, dealing with it. Unfortunately, the reason behind this ultimate issue is tobacco. The socioeconomic condition of the patient makes COPD more burdensome [3]. The emergency visits, rate of readmission is relatively getting higher due to acute exacerbation universally. Studies have reported that the less level of physical activity is observed in patients with COPD than other chronic diseases. Physical inactivity is also one of the reasons for recurrent exacerbation of COPD and can diminish the lung functions [4]. Although many

strategies have been implemented like discharge bundles, hospital at home programs, telephonic consultation, and telemedicine but no strategy has emerged. Similarly, in 2017 National Action Plan was introduced regarding COPD. The purpose of that action plan was to make COPD as a public health priority with multi-stakeholder collaboration, like caregiver, researcher, physician, researcher and policymaker to take collaborative action for enhancement of the awareness for the diagnosis and treatment of the chronic obstructive pulmonary disease [5]. Statistics showed the COPD as 3<sup>rd</sup> leading cause of death and third cause of disability worldwide. Similarly, in United States it is forth-ultimate cause of death after cardiovascular disease. In Pakistan, the percentage is as high as 2.8% then other

developing countries. The morbidity and mortality are both attributable to COPD that probably even greater globally and nationally than reported because many goes undiagnosed and untreated. According to recent statistics COPD has become effect the lives of million patients, not only the sufferers are dealing with this deadly increase but it has added more burden for obtaining care on health care system [6]. Many barriers are preventing COPD for obtaining proper care; one such barrier is patient's own perception regarding their health and severity of the disease [7]. Health care system has introduced many new interventions to limit this drastic impact due to deadly increase in COPD like home intervention and many more telemedicine's and intervention along with tele consultation. However, the patient way of perceiving their illness and general health is making this effort worthless. There is also a difference in patients' own assessment of disease severity and the intensity of breathlessness, activity limitation and airway obstruction [8]. COPD produces a very pertinent effect on the common well-being and quality of life of the sufferers who encountered from it. Other than the known indications of the illness, other aspects show significant daily challenges for patients with COPD, indeed in spite of the fact that they may go unnoticed by the doctor [9]. Perception related to general health and severity of the illness is directly linked with the understanding of the disease and its prognosis and it is associated with the information which the patient has been provided with the treatment during the course of illness [10]. While the patient's good perception is essential for the successful management of the disease. The concept of perception can be explained beyond more information and knowledge regarding the diagnosis and the prognosis of the disease [11]. Behavioral research approaches guiding education and focusing on the central role of illness perception: (patient's ideas, views and beliefs). Patient's perception towards their disease and symptoms is formed on the basis of information and by observed encounter with illness and awareness from medical sources such as physician's health care workers and books and also with internet resources [12]. The prevalence and incidence of COPD remained stationary over the years, but still very high [13]. If the current situation remains the same it will continue to increase the rate of COPD in the country. So, the comprehensive social and behavioral approaches needed to limit the risk factors along with other treatment and identification measures which is most important for the management of COPD [14]. Many Studies have emphasized on the concept of illness perception in the management of COPD and suggest research and clinical opportunities for assessing the level of patient's illness perception to improve medical outcomes in COPD patients

[15]. So, the aim of the current study is to assess the level of illness perception regarding the severity of the disease among COPD patients.

## METHODS

A cross-sectional study was conducted at Sheikh Zayed Hospital of Lahore, Pakistan. The study population was patients visiting to pulmonology Outpatient Department of Sheikh Zayed Hospital, Lahore, Pakistan. Patients were targeted through purposive sampling technique. The study sample size was calculated using Slovin's formula. The questionnaire was validated from five experts. The content validity index was  $23/25=0.92$  and the Cronbach's Alpha of the questionnaire was 0.831. A translated and modified illness perception questionnaire was used to gather the information from the sample about illness perception consisting of 25 ranging from strongly disagree to strongly agree. The researcher with the consent of patients who cannot read and write filled the questionnaire. Data was analyzed by using SPSS version 21.0.

## RESULTS

The participants with age group 30-40 years were 7(5.1%), 41-50 years were 59(43.1%) and 51-above years were 71(51.8%). Males were 98 (71.5%) and females were 39 (28.5%). There were 70 (51.1%) unmarried and 67 (48.9%) married participants. Participants having primary education, middle education, matriculation, intermediate, bachelors and others were 13(9.5%), 24 (17.5%), 62 (45.3%), 20(14.6%), 12(8.8%) and 6(4.4%) respectively (Table 1).

Variables	Frequency (%)
<b>Age</b>	
31-40	7(5.1%)
41-50	59(43.1%)
51-Above	71(51.8%)
<b>Gender</b>	
Male	98(71.5%)
Female	39(28.5%)
<b>Marital Status</b>	
Married	67(48.9%)
Single	70(51.1%)
<b>Education Status</b>	
Primary	13(9.5%)
Middle	24(17.5%)
Matric	62(45.3%)
Intermediate	20(14.6%)
Bachelors	12(8.8%)
Others	6(4.4%)
<b>Percentile</b>	
Poor	72(52.6%)
Good	65(47.4%)
Total	137(100.0%)

**Table 1:** Demographic Analysis

According to Table 2, participants who expected to have this sickness for the rest of their lives included individuals who strongly disagreed were 15 (10.9%), disagreed 5 (3.6%), neither agreed nor disagreed 7 (5.1%), agreed 60 (63.5%), and strongly agreed 50 (36.5%). Similarly, when asked if their sickness had a substantial impact on their lives, 4 (2.9%) strongly disagreed, 6 (4.4%) disagreed, 23 (16.8%) neither agreed nor disagreed, 61 (44.5%) agreed, and 43 (31.4%) strongly agreed. Participants who strongly disagreed that their illness was serious were 15 (10.9%), disagreed were 21 (15.3%), neither agreed nor disagreed were 30 (21.9%), agreed were 45 (32.8), and strongly agreed were 26 (19.0%). Participants who answered that their sickness was simple to live included individuals who disagreed 34 (24.8%), disagreed 27 (19.7%), neither agreed nor disagreed 30 (21.9%), agreed 28 (20.4%), and highly agreed 18 (13.1%). Respondents who severely disagreed were 14 (10.2%), disagreed were 18 (13.1%), neither agreed nor disagreed were 54 (39.4%), agreed were 31 (22.6%), and highly agreed were 20 (14.6%) in response to the question of having power to influence their illness. Participants who strongly disagreed believing their illness has a significant impact on how others perceive them were 19 (13.9%), disagreed were 39 (28.5%), neither agreed nor disagreed were 15 (10.9%), agreed were 39 (28.5%), and highly agreed were 25 (18.2%). Participants who strongly disagreed with the statement that their illness causes difficulties for others close to them were 10 (7.3%), disagreed were 23 (16.8%), neither agreed nor disagreed were 40 (29.2%), agreed were 34 (24.8%), and strongly agreed were 30 (21.9%). Participants who highly disagreed with the statement that nothing they do will affect their sickness were 13 (9.5%), those who disagreed were 27 (19.7%), those who did neither agree nor disagree were 32 (23.4%), those who agreed were 41 (29.9%), and those who strongly agreed were 24 (17.5%). Participants who highly disagreed with the statement "there is a lot I can do to control my symptoms" were 6 (4.4%), those who disagreed were 9 (6.6%), those who neither agreed nor disagreed were 18 (13.1%), agreed were 55 (40.1%), and strongly agreed were 49 (35.8%).

I expect to have this illness for the rest of my life				
Variables		N (%)	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	15(10.9)	10.9	10.9
	Disagree	5(3.6)	3.6	14.6
	Neither Agree nor Disagree	7(5.1)	5.1	19.7
	Agree	60(43.8)	43.8	63.5
	Strongly Agree	50(36.5)	36.5	100.0
	Total	137(100)	100.0	
My illness has major consequences on my life				
Valid	Strongly Disagree	4(2.9)	2.9	2.9
	Disagree	6(4.4)	4.4	7.3
	Neither Agree nor Disagree	23(16.8)	16.8	24.1

	Agree	61(44.5)	44.5	68.6
	Strongly Agree	43(31.4)	31.4	100.0
	Total	137(100.0)	100.0	
My illness is easy to live with				
Valid	Strongly Disagree	34(24.8)	24.8	24.8
	Disagree	27(19.7)	19.7	44.5
	Neither Agree nor Disagree	30(19.7)	19.7	66.4
	Agree	28(20.4)	20.4	86.9
	Strongly Agree	18(13.1)	13.1	100.0
	Total	137(100.0)	100.0	
I have the power to influence my illness				
Valid	Strongly Disagree	14(10.2)	10.2	10.2
	Disagree	18(13.1)	13.1	23.4
	Neither Agree nor Disagree	54(39.4)	39.4	62.8
	Agree	31(22.6)	22.6	85.4
	Strongly Agree	20(14.6)	14.6	100.0
	Total	137(100.0)	100.0	
My illness strongly affects the way others to see me				
Valid	Strongly Disagree	19(13.9)	13.9	13.9
	Disagree	39(28.5)	28.5	42.3
	Neither Agree nor Disagree	15(10.9)	10.9	53.3
	Agree	39(28.5)	28.5	81.8
	Strongly Agree	25(18.2)	18.2	100.0
	Total	137(100.0)	100.0	
My illness causes difficulties for those who are close to me				
Valid	Strongly Disagree	10(7.3)	7.3	7.3
	Disagree	23(16.8)	16.8	24.1
	Neither Agree nor Disagree	40(29.2)	29.2	53.3
	Agree	34(24.8)	24.8	78.1
	Strongly Agree	30(21.9)	21.9	100.0
	Total	137(100.0)	100.0	
Nothing I do will affect my illness				
Valid	Strongly Disagree	13	9.5	9.5
	Disagree	27	19.7	29.2
	Neither Agree nor Disagree	32	23.4	52.6
	Agree	41	29.9	82.5
	Strongly Agree	24	17.5	100.0
	Total	137	100.0	
There is a lot which I can do to control my symptoms				
Valid	Strongly Disagree	6	4.4	4.4
	Disagree	9	6.6	10.9
	Neither Agree nor Disagree	18	13.1	24.1
	Agree	55	40.1	64.2
	Strongly Agree	49	35.8	100.0
	Total	137	100.0	

**Table 2:** Response of participants with COPD on questions regarding general health and disease severity

## DISCUSSION

The perception score was assessed through modified translated illness perception questionnaire (IPQ). The descriptive analysis was performed. Cronbach Alpha, Bartlett's and KMO values has been checked to insure the reliability and validity of questionnaire in our context. Baiardini et al., findings were consistent with our study [16].



Similarly, people expecting to have this illness for the rest of their life, majority agreed were approximately 60 (63.5%) and strongly agreed were 50 (36.5%). Panjwani et al., study showed poor disease and health perception and thinking to have this illness for rest of their life [17]. Moreover, response to the question that their illness has major consequences on their life, majority participants agreed 61(44.5%), and strongly agreed were 43(31.4%). Total participants who responded to the question that their illness was easy to live with: strongly disagreed were 34 (24.8%), disagreed were 27 (19.7%), neither agreed nor disagreed were 30 (21.9%), agreed were 28 (20.4%) and strongly agreed were 18 (13.1%). On the other hand, responses to the question that their illness strongly affects the way other to see them: strongly disagreed were 19 (13.9%), disagreed were 39 (28.5%), neither agreed nor disagreed were 15 (10.9%), agreed were 39 (28.5%) and strongly agreed were 25(18.2%). The responses against the question that their illness causes difficulties for those who are close to them: strongly disagreed were 10 (7.3%), disagreed were 23 (16.8%), neither agreed nor disagreed were 40 (29.2%), agreed were 34 (24.8%) and strongly agreed were 30 (21.9%), these findings are consistent with the previous study findings [18]. Similarly, the responses to the next question that there is a lot which they can do to control their symptoms: strongly disagreed were 6 (4.4%), disagreed were 9(6.6%), neither agreed nor disagreed were 18(13.1%), agreed were 55(40.1%), and strongly agreed were 49 (35.8%). Majority showed good perception. Regarding the question that nothing they do will affect their illness: strongly disagreed were 13 (9.5%), disagreed were 27 (19.7%), neither agreed nor disagreed were 32 (23.4%), agreed were 41 (29.9%), and strongly agreed were 24 (17.5%). Pavon Blanco et al., study findings were consistent with this study [19]. Participants who responded to the question that they have the power to influence their illness: strongly disagreed were 14 (10.2%) disagreed were 18 (13.1%), neither agreed nor disagreed were 54 (39.4%), agreed were 31 (22.6%) and strongly agreed were 20 (14.6%). The overall results showed the majority participants had illness perception score below average, with poor perception score were 72 (52.6%) and good perception score were 65 (47.4%). The study results were consistent with another study conducted by Ovcharenko and colleagues[20].

## CONCLUSIONS

The current study concluded that the perception related to health and disease is playing an important role in management of chronic illness. The study results showed the overall perception of the patient is poor which might be the reason of their anxiety and depression that ultimately leads to flare up attack more frequently, and they need to

visit more often. So, there is a need to enhance patient's understanding about their illness by giving them knowledge along with treatment that will change their perception regarding the course of illness and their perception regarding their health. It will also help patients in dealing with their symptoms at home.

## Conflicts of Interest

The authors declare no conflict of interest.

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Demographic Association of Low Back Pain; A Case Control Study

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## ARTICLE INFO

## Key Words:

Demographic data, Correlation, Low back pain, Occupation, Body Mass Index

## How to Cite:

Khokhar, S. K., Qamar, A., Surti, A., Fahim, M. F., & Mahar, Y. (2022). Demographic Associations of Low Back Pain; A Case Control Study: Demographic Association of Low Back Pain. *Pakistan Journal of Health Sciences*, 3(06).<https://doi.org/10.54393/pjhs.v3i06.315>

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Received Date: 4th November, 2022

Acceptance Date: 16th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

Low back pain is a condition of prime concern by World Health Organization. It affects the quality of life and execution of work at jobs worldwide. Among these 90% cases are categorized as non-specific low back pain. **Objectives:** To evaluate demographic characteristics of cases of low back pain (LBP). To compare the BMI between cases and control groups in relation to low back pain. **Methods:** This case control study was undertaken on 178 subjects, comprising of equal number of cases of LBP and healthy controls with age ranging from 18-65 year, enrolled by non-probability convenience sampling at PNS Shifa Hospital, Karachi after obtaining ethical approval from ERC of BUHSC. Demographic parameters like gender, age, marital status, and occupation were noted on pre-designed proforma and compared between cases and controls. Body mass index (BMI) was also compared between the groups. **Results:** The study showed LBP as more common in women, with significant association with marital status, occupation and BMI. The participants were divided into 5 groups according to age, maximum 29.8%, participants were in age group 36-45 years followed by 24.7% in 26-30 years, 20.2% in 46-55 years, 16.95 in 18-25 years and only 8.4% in 56-65 years. Most of the cases were housewives followed by office workers. A highly significant result was seen when BMI was compared between cases and control as most of the cases (41.6%) were overweight as compared to controls. **Conclusion:** The incidence of LBP was more among women, married, housewives and overweight subjects.

## INTRODUCTION

Low back pain (LBP) is a comprehensive term including a substantial number of conditions. It can be defined as pain taking place between 12th rib and gluteal folds, which is usually accompanied by discomfort and/or stiffness [1]. The pain can be regarded either specific or non-specific, depending on the factors causing it. The specific causes of LBP include pathology, like infection, fracture, rheumatoid arthritis, osteoporosis, or tumor, while non-specific LBP is not due to an identifiable or distinctive pathology [2]. Up to 80% of individuals can be affected and about 90% cases are due to nonspecific LBP. Current epidemiological data revealed that annual global incidence of this condition is 245.9 million with a prevalence of 577 million and disability-adjust life years (DALYs) accounting for 64.9 million [3]. Low back pain is recognized by World Health Organization as a condition of prime concern, as this health problem

affects quality of life and execution of work at jobs throughout the world. The socioeconomic effect of the disease highlighted the importance of effective and time treatment to upgrade the quality of life, enhancing return to work [4]. Backache has been one of the major causes of disability in our population as well [5]. It has been determined that 40.65% of the Pakistani population over the age of 50 years suffers from low back pain. Its prevalence is 2.5 times higher among women who seldom perform moderate physical activity in their daily routine. Local data also revealed that obesity, prolonged desk jobs, lack of health awareness and exercise, psychological disorders and heavy weight bearing jobs are more commonly associated with LBP in Pakistani population as compared to the general population. Its prevalence is also more in urban than in rural areas [6]. With this background,

the current study was planned to observe the demographic association in cases of low back pain and to compare them with healthy individuals in our area.

## METHODS

A total of 178 subjects (89 in each group) were recruited for this case control study. After approval of the study from ethics committee of Bahria University Health Sciences Campus, Karachi, this study was conducted at the rehabilitation department of PNS Shifa Hospital, Karachi. Male and female patients within the age bracket of 18-65 years who were diagnosed with acute and chronic lower back pain were made part of the cases while subjects visiting the outpatient department with complaints other than low back pain were placed in the control group. However, patients with any type of trauma, ankylosing spondylitis, arthritis (rheumatoid and osteoarthritis), fracture of sacral spine, skeletal hyperostosis and pregnancy were excluded from the study. Demographic parameters like age, gender, height, weight, body mass index (BMI) and occupation were noted on pre- designed proforma. Data were analyzed using SPSS version 23.0. Means and standard deviations were expressed for quantitative variables like age and BMI, while qualitative variables were expressed as frequency. T-test was used to compare the height and weight in cases, while Chi square test were used to see to the association of marital status and gender in cases. Fischer's exact test was applied to compare BMI and occupation between cases and controls. A p-value  $\leq 0.05$  was considered as statistically significant.

## RESULTS

One hundred and seventy-eight study participants were divided equally into cases and controls. 75 were males while 103 were females as shown in table 1. The participants were divided into 5 groups according to age (years)(18 -25, 26 -35, 36 -45, 46 -55 & 56 -65). Maximum (29.8%) participants were in age group 36-45-year, followed by 24.7% in 26-30-year(table 1).

Gender	Frequency (%)
Male	75 (42.1%)
Female	103 (57.9%)
Marital Status	Frequency (%)
Married	147 (82.6%)
Single	31 (17.4%)
Age	Frequency (%)
18-25	30 (16.9%)
26-35	44 (24.7%)
36-45	53 (29.8%)
46-55	36 (20.2%)
56-65	15 (8.4%)
Occupation	Frequency (%)
Retired	4 (2.2%)

Manual laborer	1(0.6%)
Office worker	57(32%)
Student	6(3.4%)
Housewife	80(44.9%)
Self employed	2(1.1%)
Field work	21(11.8%)
Other	7(3.9%)
Group	Frequency (%)
Case	89(50%)
Control	89(50%)
Low Back Pain	Frequency (%)
Yes	89(50%)
No	89(50%)

**Table 1:** Demographic features of Study Participants(n=178)

Chi-square test was applied and association between marital status between cases and controls was found to be significant with a p-value of 0.003(table 2). 91% cases were married while only 9% cases were single. Out of 89 controls, it was observed that 74.2% were married while 25.8% were single (table 1). The study showed significant results (p value = 0.003) on comparing the occupation with back pain in cases and controls (table 2) by applying Fischer's exact test. It was evident that most of the cases were housewives followed by office workers(table 2).

Marital Status	Case (n=89)	Control (n=89)	Total	p-value
Married	81	66	147	0.003*
	91.0%	74.2%	82.6%	
Single	8	23	31	0.003*
	9.0%	25.8%	17.4%	
Age (years)	Case (n=89)	Control (n=89)	Total	p-value
18-25	9	21	30	0.091
	10.1%	23.6%	16.9%	
26-35	25	19	44	
	28.1%	21.3%	24.7%	
36-45	27	26	53	
	30.3%	29.2%	29.8%	
46-55	22	14	36	
	24.7%	15.7%	20.2%	
56-65	6	9	15	
	6.7%	10.1%	8.4%	
Occupation	Case (n=89)	Control (n=89)	Total	p-value
Retired	0	4	4	0.003*
	0.0%	4.5%	2.2%	
Manual laborer	1	0	1	
	1.1%	0.0%	.6%	
Office worker	23	34	57	
	25.8%	38.2%	32.0%	
Student	0	6	6	
	0.0%	6.7%	3.4%	
Housewife	51	29	80	
	57.3%	32.6%	44.9%	
Self employed	2	0	2	

	2.2%	0.0%	1.1%	
Field work	9	12	21	
	10.1%	13.5%	11.8%	
Other	3	4	7	
	3.4%	4.5%	3.9%	

**Table 2:** Comparison of Marital Status, Age and Occupation between Cases and Controls (n=178)

A highly significant result (p value = 0.000) was seen on applying Fischer's Exact test between BMI and back pain (table 3). Most of the cases (41.6%) were overweight as compared to controls. Thereby, establishing the fact that BMI plays a significant role in back pain.

BMI	Group		Total	p-value
	Control	Case		
Underweight (<18.5)	6	1	7	0.000*
	6.7%	1.1%	3.9%	
Normal (18.5-24.9)	77	32	109	
	86.5%	36.0%	61.2%	
Overweight (25-29.9)	6	37	43	
	6.7%	41.6%	24.2%	
Obese Class I (30-34.9)	0	15	15	
	0.0%	16.9%	8.4%	
Obese Class II (35-39.9)	0	1	1	
	0.0%	1.1%	.6%	
Obese Class III (>40)	0	3	3	
	0.0%	3.4%	1.7%	
Total	89	89	178	
	100.0%	100.0%	100.0%	

**Table 3:** Comparison of BMI between Cases and Controls (n=178)

## DISCUSSION

Low back pain is one of the most frequently experienced health problem which majority of people encounter at some point in their daily work life [7]. It is the second most frequent global public health problem, after headache in the categorization of painful disorders which affect human beings [2]. In the present study, demographic data of participants (gender, marital status, age, and occupation) was compared between cases of backache and healthy controls to perceive significance of difference in relation to low back pain. In this study, there were 42.1% males and 57.9% females out of total study participants. There were more cases of low back pain in women (62.9%) in comparison to men (37.1%). Muazzam et al., also observed that among 366 subjects, majority 266 (72.7%) were women, whereas 100 (27.3%) were men [8]. Chatterjee et al., found 57% of the cases of low back pain to be female [1]. Adhikari et al., and Sachdev et al., [9, 10] also found similar results. This difference is most likely due to conditions which are specific to women such as premenstrual syndrome and pregnancy. There is increased secretion of progesterone during pregnancy which leads to relaxation of ligaments between pelvic bones including vertebrae,

leading to enhanced incidence of low back pain. This may also be due to the increased pain sensitivity among women, and fluctuations of hormones with menstrual cycle. The physiological effects of pregnancy and childbirth as well as physical stress of upbringing children renders them more susceptible to LBP [11]. In disagreement to the current study, Zafar et al., found presence of low back pain more in males (51.7%) in comparison to females (48.3%) [12]. However, this difference between the gender was not statistically significant. Other studies also showed similar results [13]. In the present study, most (82.6%) study participants were married whereas few (17.4%) were unmarried. Also, a high percentage of the cases were married (91%) as compared to healthy controls (9.0%), which was statistically highly significant (p=0.003). Workneh et al., observed results similar to our study as 60.4% of the 285 participants in their study were married [7]. Similar findings were also observed by Ramdas et al., as they found that 90.8% low back pain cases were married whereas 9.2% were unmarried [14]. Contradictory results were observed by another study who observed higher proportion of single individuals (15,830) as compared to married ones (5,425) out of the total study population (21,255) [15]. In the present study, the participants (age ranging from 18-65 years) were divided into smaller groups according to the age for comparison between cases and controls. The highest numbers of cases (27; 30.3%) were noted in 36-45-year age group, followed by 26-35 year (25; 28.1%). However, statistically significant difference was not found in age between cases and controls (p=0.091). This was in agreement to Rasheed et al., who also observed 78.57% of cases of low back pain in the age group of 32-44 year, followed by age group of 18-31 years [16]. Another study also reported highest prevalence of back pain in ages 21-40 years (48%). It was observed a highly significant result when differences were assessed in occupation between cases of low back pain and healthy controls. Most of the cases were housewives (44.9%) followed by office workers (25.8%). Zafar et al., also depicted back pain most frequently among housewives (30%), followed by office workers (18.1%). This was most likely due to the exhausting routine of housewives in Pakistan, as they are expected to do physical jobs like washing clothes with hand, doing dishes, and cleaning their house, while care is not given to posture or comfort [12]. The office workers usually work in a fixed sitting position for prolonged hours while using a small number of muscles of the body, such as arms, forearms, wrists and hands, thus adopting a poor posture. This leads to greater chances of developing musculoskeletal disorders. The body adjusts to a non-neutral position which causes stress to the lumbar region and causes pain [13]. This might also be due to the reason

that muscles are unable to relax due to the continuous work and flow of blood may be reduced when they work in a fixed position further augmenting back pain [7]. The present study revealed a highly significant association between body mass index (BMI) when compared between cases of low back pain and healthy controls, as majority (41.6%) of the cases were included in the overweight category. In the control group, most participants (86.5%) had normal BMI. Peng et al., also reported high prevalence of low back pain in obese (36.4%) and overweight (29.6%) groups [17]. Similar results were determined by other studies [18, 19]. The findings of Najafi et al., were in disagreement to our results as they found no significant difference between the two groups [20]. It is most likely because obesity can increase mechanical load on spine leading to more compressive force on the lumbar vertebral column during different movements. Obesity can also initiate low back pain due to chronic inflammation, which is associated with raised acute-phase reactants and cytokines because of triggering of pro-inflammatory pathways resulting in pain [21]. The body mass index is regarded as measure of body weight status, the greater the weight, more pressure is exerted not only on the spine, but also intervertebral discs and related back structures to produce LBP [15].

## CONCLUSIONS

The present study provides an insight into the demographic data of the subjects suffering from low back pain. It revealed significant association of gender, marital status, occupation, and obesity with nonspecific low back pain. The results have demonstrated increased incidence of back pain in women, married individuals, housewives, followed by office workers and overweight participants in our society.

## Conflicts of Interest

The authors declare no conflict of interest.

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Dengue 2021: Trend and Infection rate in Teaching Hospitals of Rawalpindi

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## ARTICLE INFO

## Key Words:

Dengue, Trend, Infection Rate, Teaching Hospitals

## How to Cite:

Shahid, R. ., Mujeeb Khan, M. ., Khan, S. ., Zaidi, N. ., & Abdul Rehman, S. . (2022). Dengue 2021: Trend and Infection rate in Teaching Hospitals of Rawalpindi : Dengue 2021 Trend and Infection Rate in Teaching Hospitals. Pakistan Journal of Health Sciences, 3(06). <https://doi.org/10.54393/pjhs.v3i06.335>

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Received Date: 7th November, 2022

Acceptance Date: 24th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

Dengue is a viral infection that is transmitted to human through bite of Aedes mosquito which in turn incorporates dengue virus in human blood. **Objectives:** To determine the trend of dengue cases reporting in Teaching hospitals of Rawalpindi during 2021 and dengue infectivity rate.

**Methods:** A cross-sectional descriptive study was done in teaching hospitals (Holy Family Hospital, Benazir Bhutto Hospital and District Head Quarters Hospital) affiliated with Rawalpindi Medical University during September and October 2021 to study the trend of dengue cases and infection rate. The data were gathered with permission of Medical Superintendent working in each of the 3 hospitals pertinent to the number of patients visiting Infectious Diseases OPD, patients admitted and verified as dengue positive on lab investigations. Data were analyzed by means of Microsoft Excel 2010. **Results:** About 1509 patients visiting Dengue OPD during September 2021 while 9765 patients visited during October 2021. Dengue infection rate among patients attended and being managed in three public sector tertiary care hospitals was 21.6% and 13.6% during September and October 2021 respectively. **Conclusion:** Dengue infection rate indicates the need to strategize for regional curtailment of this disease.

## INTRODUCTION

Dengue is a viral infection that is transmitted to human through bite of Aedes mosquito which in turn incorporates dengue virus in human blood. About 100-400 million dengue cases are reported worldwide [1]. A broad spectrum of clinical manifestations is attributed to dengue that range from subclinical infection to severe mortal complications [2]. Dengue fever is most likely to end up with complete recovery of the patients but dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) may come to halt with grave health consequences [3]. Dengue is endemic in Pakistan and tremendous dengue cases were reported during epidemics [4]. After hitting the big towns, dengue virus infection also drastically affected the neighboring proximities [5]. Dengue cases

and associated deaths are known to be more frequent from July to November and particularly among males due to their maximal indulgent in outdoor activities [6]. Sudden surge of dengue infections was noticed in Rawalpindi during 2016. Rawalpindi being located near the Islamabad Capital Territory (ICT) has humid climate that promotes the dengue virus proliferation particularly after rainfall [7]. One of dengue outbreaks afflicted in 2019 which accounted more than 19,000 cases [8]. Of the total 47,120 dengue cases reported in Pakistan during dengue epidemic 2019, about 12,192 dengue cases were catered in three tertiary care hospitals of Rawalpindi Medical University [10]. However, 3,204 dengue cases were registered during 2020 in Pakistan [9]. Confrontation of general public as well as



healthcare personnel with escalating dengue cases amidst COVID-19 pandemic is quite challenging [11]. WHO regional office in Pakistan is fully committed to provide case management guidelines and technical support for capacity building of the staff for health promotion and specific protection in three major provinces of Pakistan that are currently prone to dengue epidemic [12]. The present study is intended to give an overview of recent trend of dengue cases reported in public sector teaching healthcare facilities affiliated with Rawalpindi Medical University. Reviewing the current trend of dengue cases can enable our policy makers to have optimistic and rational approach towards strategic planning for curtailment of this menace.

**METHODS**

A cross-sectional descriptive study was carried out in 3 teaching hospitals (Holy Family Hospital, Benazir Bhutto Hospital and District Head Quarters Hospital) affiliated with Rawalpindi Medical University during September and October 2021 to determine the trend of dengue cases and infection rate. The data was collected with permission of Medical Superintendent from each of the 3 hospitals regarding the number of patients visiting Infectious Diseases OPD, patients admitted and confirmed as dengue positive on lab investigations. Data was analyzed by using Microsoft Excel 2010.

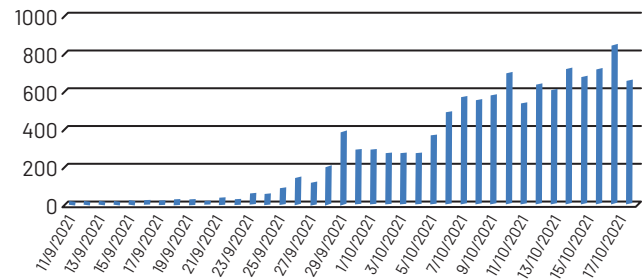
**RESULTS**

Patients with dengue related symptoms started visiting Medical / Infectious Diseases OPD in public sector teaching hospitals from 11th September 2021. Depending on the bed strength of all 3 hospitals (HFH, BBH, DHQ), the number of patients presenting in OPD, admitted and confirmed dengue positive by testing is shown below in Table 1.

Parameters	Holy Family Hospital (Hfh)	Benazir Bhutto Hospital (BBH)	District Head Quarters Hospital (DHQ)	Total
Patients registered in Outdoor patient department (OPD)	7846 (69.6%)	2153(19.1%)	1275 (11.3%)	11274
Patients admitted	1733 (67.5%)	576 (22.4%)	259 (10.1%)	2568
Confirmed Patients (Dengue fever)	1039 (62.8%)	410 (24.8%)	205 (12.4%)	1654

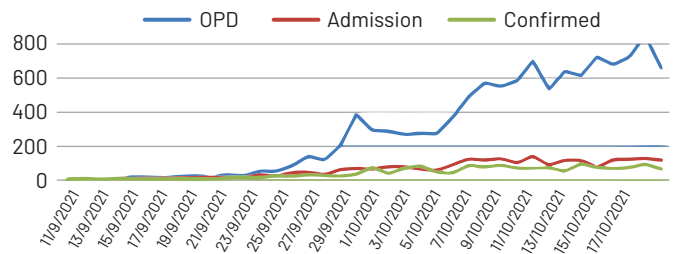
**Table 1:** Patients visiting, admitting and confirming as dengue cases in 3 Teaching Hospitals

There were about 1509 cases who visited dengue OPD of all 3 teaching hospitals during September 2021 with admission of first case on 11th September, while about 9765 patients visited OPD from 1st- 18th October 2021 as depicted below in Figure 1.



**Figure 1:** Date-wise frequency of cases visiting dengue OPD

Of the total 11274 patients presenting in Infectious Diseases OPD from 11th September – 18th October 2021 with dengue associated symptoms, only 1653 (13.5%) were verified as dengue cases as illustrated below in Figure 2.



**Figure 2:** Trend of dengue cases, patients visiting with symptoms and confirmed cases

About 326 cases were determined as confirmed cases during September 2021 while 1328 cases were verified during October 2021. Dengue positivity rate (infected / visiting OPD × 100) in public sector teaching hospitals of Rawalpindi was determined to be 21.6% and 13.6% during September and October 2021 respectively.

**DISCUSSION**

Dengue is quite devastating public health issue frequently encountered in urban slums as well as semi-urban zones of globally endemic regions. Ranawaka et al., found that greater than 70% of dengue infections detected in Asian countries, case fatality rate is anticipated to be 20% without appropriate case management [13]. In our study, about 326 confirmed dengue cases were reported from 11th -30th September 2021 with highest frequency that is 74 cases / day were admitted in RMU affiliated teaching hospitals on 30th September 2021. In major cities of Punjab particularly in Lahore, dengue cases were drastically escalated in last week of September 2021. Periodic surveillance of at risk places like tyre shops and graveyards was carried out by the concerned officials for fumigation and drainage of stagnant water in order to eliminate the mosquito breeding places. These measures in addition to awareness campaign are of paramount significance in order to prevent the repetition of dengue epidemic 2019 scenario [14]. In comparison with our research, Indian statistics pertinent to dengue showed crowning of cases in

September 2021 that was determined to be about 217. However, dengue cases in September 2020 amidst peak of COVID pandemic were approximately 188 revealing fewer predilections for dengue last year [15]. On the other hand, drastic reduction in dengue cases in Malaysia was observed from 63,988 during Jan–Aug 2021 to 16,565 during the same tenure in 2021. As there was no vaccine against dengue, so strict adherence to preventive strategies was the only option to mitigate the chances of dengue epidemic at this crucial moment when our frontline warriors are already confronted with COVID pandemic associated healthcare challenges [16]. Pan American Heart Organization (PAHO) verified the occurrence of 416,289 dengue cases till 18th September 2021 and approximately 265 dengue related deaths in various states of America. The countries revealing the highest propensity of dengue cases during 2021 are Brazil, Peru, Nicaragua, Colombia and Mexico. Likewise, Pakistan, rise in dengue cases was spotted in other Asian countries including Bangladesh, Cambodia and Laos [17]. The rapid spread of bacterial and viral infections across the world has become possible due to globalization. Already sufficient health resources in our healthcare facilities were spent in investigating and managing the COVID menace since March 2020; it will be impossible for our healthcare professionals to manage the exceeding dengue cases along with COVID havoc in public sector hospitals due to limited budget and staff shortage. Tan et al., found that most of the dengue cases were notified across the globe but still this infection constitutes the submerged portion of disease iceberg due to under-reporting or misdiagnosis of most of the cases [18]. In view of emerging and re-emerging infections, World Health Organization is seriously committed to pledge with other countries for adequate preparedness in order to fight against Public Health Emergencies of International Concern (PHEIC). Even one of the ten issues declared by WHO to track in 2021 was to curtail the spread of communicable diseases like polio, TB, malaria etc. by vaccinating the missed population during 2020 [19]. COVID-19 cases throughout Punjab on 21st October were reported to be 364 showing adequate curbing of this havoc that has become possible by strict observation of SOPs and mass vaccination drive [20]. Umar et al., found that despite the increased susceptibility to infectious disease outbreaks, reduction in COVID cases in Pakistan can be attributed to provision of testing amenities, health awareness, closure of educational institutes and periodic lockdown imposition [21]. Unfortunately, our healthcare workers are managing COVID-19 and dengue cases simultaneously [4]. The co-infection with COVID and dengue had also been reported among residents of India, Brazil and France [22, 23]. Resources like healthcare

workforce, infrastructure and testing kits are required for both of these infectious diseases for their apt diagnosis, timely management and prevention of grave health consequences.

## CONCLUSION

Dengue infection rate indicates the need to strategize for regional curtailment of this disease. Dengue infection rate in Rawalpindi district can substantially be mitigated by opting administrative and healthcare impositions.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Diabetes Self Care, Resilience and Quality of Life among Patients with Type II Diabetes

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## ARTICLE INFO

## Key Words:

Diabetes, self-care, resilience, quality of life, clinical psychologists

## How to Cite:

khan, zahra ., & kazmi, U. E. R. . (2022). Diabetes Self Care, Resilience and Quality of Life among Patients with Type II Diabetes: Self Care, Resilience and Quality of Life among Patients with Type II Diabetes. *Pakistan Journal of Health Sciences*, 3(06). <https://doi.org/10.54393/pjhs.v3i06.185>

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Received Date: 3rd October, 2022

Acceptance Date: 8th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

Diabetes is highly prevalent disease in Pakistan, and it greatly impacts the quality of life of the patients. Diabetes self-care and resilience can be significant in this regard. **Objective:** To find out the relation among diabetes self-care, resilience, and quality of life in patients with type II diabetes. **Methods:** The correlation research design was used along with purposive sampling to select the sample (N=200) from Government and private hospitals of Lahore. 11 items Summary Diabetes Self-care Activity scale (SDSCA), 18 items Trait Resilience Scale (TRS) and 15 items Diabetes Quality of Life (DQOL) scale were used in the study. Researchers translated English versions of TRS and DQOL scales into Urdu language following the Lexion Equivalence method of translation. **Results:** Correlation analysis revealed significant positive relation between general diet and resilience (.61,  $p < 0.5$ ), Blood glucose and resilience (.53,  $p < 0.5$ ) and between resilience and quality of life (.77,  $p < 0.5$ ). Multiple linear regression revealed that self-care activities significantly predict quality of life. **Conclusions:** The more the patients are following self-care activities, the better will be their quality of life. The study will be helpful for clinical psychologists to boost the resilience of patients with diabetes.

## INTRODUCTION

There is drastic increase in the prevalence of diabetes all over the world [1]. Four types of diabetes are reported in literature; however, type 2 diabetes mellitus (T2DM) is more common than other types. It accounts for more than 90% of all cases than other types [2]. It is defined as a chronic illness in which body does not utilize insulin properly which resulted in infrequent blood sugar level [3]. Almost 11% Americans are living with diabetes [4]. However, in Pakistan, T2D is 11.77%. The separate prevalence in men and women is 11.20% and 9.19% respectively. In provinces like Sindh and Punjab, it is found to be 16.2% and 12.14% in adult men whereas it is 11.70% and 9.83% in women [5]. Diabetes can cause lower quality of life (QoL), greater risk of heart problems (stroke, peripheral vascular and ischaemic

disease), and reduced life expectancy [6]. Literature revealed that diabetes causes long-term damage to the body particularly to the circulatory system and the heart [7]. There is dire need to practice self-care strategies for the better management of diabetes. Self-care management is a process of awareness or knowledge by surviving with the multifaceted nature of diabetes in a social perspective [8]. This can include maintaining a healthy lifestyle, following treatment regimens, and monitoring blood sugar levels. Literature reveals that diabetic patients reported poor awareness related to self-care training, eating healthy food, following prescribed medicines, and monitoring the level of blood glucose [9]. Self-care is directly correlated with resilience in those with

chronic illnesses [10]. Resilience has been described as the innate ability to cope with stressful events, recover from them, and adjust to new situations. The more resilient the person is, the more will be the resources to adapt to or change the adversity [11]. Research reveals that less resilient persons are more vulnerable to T2DM [12]. Another research reported a positive relationship between resilience and treatment adherence. Patients with greater resilience had better treatment adherence as well as a higher quality of life [13]. Resilience training has a considerable influence on the psychological well-being of type II diabetes patients. It is suggested that resilience training may be utilized to improve patients' quality of life (QoL) as well as their ability to face life's challenges [14]. QoL is defined as a person's subjective perception of emotional, physical, and social health, as well as happiness and satisfaction [15]. Literature revealed that the presence of diabetic symptoms and concern about the condition has a negative impact on patients' QoL. Higher resilience levels were significantly linked with increased QoL [16]. The results revealed that social and psychological dimensions, old age, residing in a rural region were related with a worse QoL, whereas less diabetes-related problems, exercise, general diet, and foot care were related with a higher QoL in patients [17]. Diabetes is a manageable disease, and its prevalence is increasing in Pakistan. The major risk factors include unhealthy lifestyles and hypertension etc. Literature has revealed that diabetes self-care and resilience have an impact on the life quality [18]. The current study aimed to highlight the significance of diabetes self-care and resilience and its impact on the QoL among patients. All these variables are important for the health, better management of diabetes and well-being of diabetic patients.

## METHODS

Correlation research design was used in the study. Purposive sampling was used to select the sample. The size of sample was calculated through G-power software. The sample was selected from Government and private hospitals of Lahore and comprised of patients with type II diabetes (N=200). The age of the sample ranged from 40-60 years (M=56, SD= 6.8). Inclusion criteria included, diagnosed patients of type II diabetes and minimum duration of disease was at least 2 years. The Demographic sheet was used to assess the demographic variables. Summary Diabetes Self-care Activity scale (SDSCA) scale assesses the frequency of self-care habits [19]. The value of Cronbach alpha is .63. Urdu version of the Summary Diabetes Self-care Activity scale was used in the study. Trait Resilience Scale (TRS) is comprised of 18 statements with a 5-point rating scale. The value of Cronbach Alpha is

.84 [20]. High scores indicate higher trait resilience. The scale was translated into Urdu language in the present study according to the Lexicon Equivalence Method. Diabetes Quality of Life (DQOL) has 13 items assess the three domains, satisfaction, impact, and worry. The value of Cronbach Alpha is .93 [21]. High scores on DQOL assess poor quality of life among patients. The scale was translated into Urdu language in the present study according to the Lexicon Equivalence Method. First of all research topic was approved by the Ethical Board and Board of Studies. The researcher took permission to use and translate instruments for research, which was taken from the authors of the scales through electronic mail. After taking permission from authors, the researcher translated English versions of TRS and DQOL scale following the Lexicon Equivalence method of translation (Reiss, 1983) [22]. Lexicon considerations were followed for forward and backward translations of scales [23]. Different hospitals were visited for data collection permission. Ethical procedures were followed during the whole process of research. Formal permission was taken from the concerned authorities of the Government and private hospitals of Lahore to collect data. SPSS version 21.0 was used for analysis of data.

## RESULTS

The results reveal that women participants were (60%) and men were (40%). Their age ranged from 40-60 years (M= 50.6, SD= 6.38). Majority of the participants were graduate (34%) and married (85%). The duration of disease was reported less than 7 years in majority of patients (57%). Majority of the patients were taking oral medicines (75%). Table 1 reveals significant positive correlation among all subscales of Summary of Diabetes Self-Care Activity. There is a positive relation between general diet and resilience ( $r=.61$ ,  $p<0.01$ ), blood glucose and resilience ( $r=.53$ ,  $p<0.01$ ) and between resilience and quality of life ( $r=.77$ ,  $p<0.01$ ). Results reveal that higher the resilience, higher will the daily self care. Higher the resilience better will be the quality of life among patients.

Variables	1	2	3	4	5	6	7
General. Diet		.62**	.35**	.52**	.39**	.61**	.45**
Specific. Diet			.30**	.44**	.20**	.41**	.29**
Exercise				.43**	.25**	.34**	.32**
Blood. Glucose					.44**	.53**	.37**
Footcare						.48**	.37**
Resilience							.77**
QoL							

**Table 1:** Pearson Moment Correlation among Subscales of Self-care Activities, Resilience and Quality of Life

Table 2 shows the impact of Diabetes Self-Care Activity (subscales) on Quality of life. The R<sup>2</sup> value of .27 revealed that the self-care activities explained 27% variance in QoL

with  $F(14.57) = 35.1, p < .001$ . The findings revealed that subscales of Diabetes Self-Care Activity; General diet ( $\beta = .28, p < .01$ ), Exercise ( $\beta = .16, p < .05$ ), Foot care ( $\beta = -.18, p < .05$ ) are significant positive predictors of quality of life in patients. Hence it is revealed that higher the self-care, the better will be the life quality.

Variables	Quality of Life		
	B	$\beta$	SE
Constant	48.22***		2.
General. Diet	.92**	.28	.51
Specific. Diet	.00	.00	.28
Exercise	.31*	.13	.54
Blood. Glucose	.29	.08	.16
Footcare	.51*	.18	.26
R <sup>2</sup>	.27		.19
F	14.57		

Note. \*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$

**Table 2:** Multiple Linear Regression Analysis of Diabetes Self-Care Activity(subscales)on Quality of life.

## DISCUSSION

This study aims to explore the relationship among self-care, resilience, and quality of life in patients with T2D. The hypothesis of the study stated that there would be a significant positive relationship among diabetes self-care, resilience, and quality of life. The results revealed significant positive correlation among all study variables. Literature also suggests that there is significant positive relation among these variables and these findings are consistent with previous literature [13, 24, 25, 26]. Next hypothesis claimed that diabetes self-care would likely to predict diabetes quality of life in patients with T2D. The findings revealed that subscales of Diabetes Self-Care Activity significantly predict quality of life among patients. The findings reveal that general diet, exercise, and foot care are significant positive predictors of quality of life. These findings suggest that the more the patient are following the proper diet plans advised by their doctors, regular exercise and taking care of their foot for any wound, the better will be their QOL. Because self-care practices help in the management of disease which ultimately affect the quality of life and these findings are also consistent with the literature [27, 28]. Literature reveals that self-care habits, gender and diabetes complications are significant predictors of QOL [29]. Literature further reveals that patients who are living with diabetes from longer duration show more adherence towards medicine and self-care activities [30].

## CONCLUSIONS

The findings reveal that there was significant positive relation among self-care activities, resilience, and quality of life in patients with T2D. Moreover, the diabetes self-care

activities (general diet, exercise, foot care) were found to be significant positive predictors of quality of life among diabetic patients. The increasing prevalence of diabetes highlights the importance of resilience and quality of life among patients with T2D. The findings of the study will be implicated in health and clinical settings.

## Conflicts of Interest

The authors declare no conflict of interest.

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Diagnostic Accuracy of Ultrasound for Benign and Malignant Hepatic Masses Taking Computed Tomography as Gold Standard

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## ARTICLE INFO

**Key Words:**

Diagnostic accuracy, CT-Scan, Malignant, Liver Mass

**How to Cite:**

Aslam, A. ., Nazir, M., Zain ul Abidin, S. ., Fatima, Z. ., Yousaf Farooq, S. M. ., Zia, S. ., Ahmad, W. ., Adrees, N. ., Naeem, S. ., Imtiaz, A., Fatima, M. ., & Rita, U. . (2022). Diagnostic Accuracy of Ultrasound for Benign and Malignant Hepatic Masses Taking Computed Tomography as Gold Standard: Diagnostic Accuracy of Ultrasound for as Gold Standard . *Pakistan Journal of Health Sciences*, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.269>

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Received Date: 19<sup>th</sup> October, 2022

Acceptance Date: 12<sup>th</sup> November, 2022

Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

Detection of benign and malignant liver masses is very important for the treatment. **Objectives:** To determine the diagnostic accuracy of ultrasound for hepatic masses taking computed tomography as gold standard **Methods:** It was cross a sectional analytical study to.it involves 266 patients suffering from hepatocellular cell carcinoma age group 45 to 65 years visiting Department of Radiology THQ Hospital Hazro, both genders were included. Consecutive sampling method was used. The collection of data was done through questionnaire and analysis by using SPSS version 25. **Results:** This study enlisted the participation of 261 patients. The average age of all patients was 59.28 14 years, with a range of 45 to 65 years. It describes that the total number of true positive disease were 228 which was also detected on ultrasound. However, the occurrence of HCC is highest on CT scan when compared with adenoma and hemangioma. There were 28 patients with multiple lesions, with 71.4 % being malignant and 28.6 % being benign. On the other hand, 22 individuals had a single lesion, of which 36.4 % were malignant and 63.6 % were benign (p 0.001). CT had a sensitivity of 96 % to diagnose a malignant lesion, a specificity of 88.4 %, an accuracy of 95.78 %, a positive predictive value of 98.70 %, and a negative predictive value of 73.33 %. **Conclusions:** The results of the present study therefore concluded that CT is a useful modality for the diagnosis of malignant liver masses. Ultrasound had high sensitivity, specificity for the hepatic masses. females were more effected than males. Among hepatic masses, HCC is the commonest.

## INTRODUCTION

Liver masses are turning out to be progressively common as imaging modalities like ultrasonography (US), processed tomography (CT), and attractive reverberation imaging (X-ray) become all the more broadly utilized in asymptomatic people, the extraordinary larger part of these sores is recognized unintentionally. For the right determination and treatment of strong liver masses, a total history and actual assessment are fundamental [1]. Utilization of oral contraceptives or anabolic steroids, for instance, might be connected to hepatic adenoma (HA), while liquor utilization and word related openness are connected to angiosarcoma and essential sclerosing cholangitis, and liver accident, Caroli's illness, and choledochal sores are

connected to cholangio-carcinoma [2]. Hepatocellular carcinoma might be shown by a past filled with hepatitis B, C, or cirrhosis of the liver (HCC). Metastatic liver sickness is more probable in the event that you've recently gotten chemotherapy or a growth [3]. In the extraordinary larger part of patients, it is feasible to utilize the benefits of imaging modalities to show up at a precise determination (1.0 cm sores are for the most part harmless) [4]. The presence or nonattendance of cirrhosis in liver masses ought not entirely settle for demonstrative purposes [5]. A hepatic mass in a cirrhotic liver ought to be thought to be HCC except if generally illustrated. In cirrhotic livers, numerous liver masses might be an indication of broad



HCC, high-level dysplastic knobs, or, in very uncommon conditions, hepatic lymphoma. Various hepatic sores are habitually an indication of liver metastases in a sound liver (most regularly from adenocarcinoma of the colon, stomach, lung, or liver)[6]. The liver, which makes around 2 % to 3 % of the general weight, is the greatest organ [7]. The liver is partitioned into two curves, which are generally depicted utilizing two distinct physical classes: morphologic life systems and useful life structures [8]. It is upheld by the ribcage and is held set up by peritoneal reflections known as ligamentous connections in the right upper quadrant of the stomach cavity under the right hemidiaphragm [9]. These connections are internal and associate with the Glisson case, the liver's adaptation of the instinctive peritoneum, regardless of not being genuine ligaments [10]. The use of contrast enhanced computed tomography for this purpose is supported by different previous studies that contrast enhanced computed tomography had an excellent diagnostic modality for the differentiation of different hepatic masses. The point of this study was to figure out the analytic exactness of ultrasound in diagnosis of hepatic masses taking computed tomography as gold standard. And, it will also help the patient to save his pocket rather than visit to other expensive modalities for the purpose of treatment and evaluation of hepatic lesions.

## METHODS

This is a cross sectional review used to assess diagnostic accuracy of ultrasound in diagnosis of hepatic masses taking computed tomography as gold standard. This is a cross sectional review study was carried out in the Department of Radiology THQ Hospital Hazro, sample size was Two hundred sixty-six patients of age group 45 to 65 years were included in this study. The inclusion criteria for data collection were patients with HCC of both genders. The exclusion criteria were patient allergic to contrast, pregnant women, any patient with renal problem which was confirmed after creatinine test. Patients was educated about the nature, objective of the review, and composed informed assent was taken, and Institutional Morals Advisory group endorsement was taken ahead of time evaluate diagnostic accuracy of ultrasound in diagnosis of hepatic masses taking 64 -slices computed tomography machine. For the analysis of data, and percentages of qualitative data and quantitative data mean standard deviation was derived. Sensitivity, specificity, PPV and NPV reported to find out the accuracy of ultrasound in hepatic masses. Consecutive sampling method was used. The collection of data were done through questionnaire and analysis by using SPSS version 25.0.

## RESULTS

In all, 261 patients were enrolled in this trial. Table 1 the total

number of patients were 261 out of which 124 patients were female and 137 were male. Minimum age limit for female suffering from the disease were 15 while maximum age for female were 95 the mean value was 57.7. SD ratio  $\pm 17.65$ . On other hand the minimum age for male were 23 and maximum age was 96 comparatively more than female. The mean value for male were  $\pm 60.8$ SD ratio for male were 14.0. However, the SD ratio of female is more as compared to male which shows that the disease rate in female is more as compared to male, Table 1.

Gender	F (N-124)	M (N-137)	Age (N-261)
Minimum	15.00	23.00	15.00
Maximum	95.00	96.00	96.00
Mean+SD	57.71+17.65	60.82+14.06	59.34+15.91

**Table 1:** Age and Sex distribution of study population(n=261)

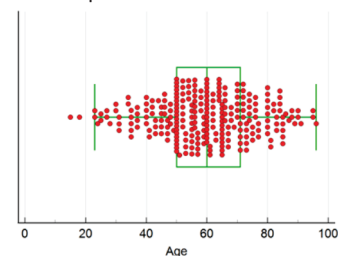
The age range for all patients was 45 to 65 years, with a mean of 59.28.14 years. It describes that the total number of true positive disease were 228 which was also detected on ultrasound. However, the occurrence of HCC is highest on CT scan when compared with adenoma and hemangioma. There were 28 patients with multiple lesions, with 71.4 % being malignant and 28.6 % being benign. On the other hand, 22 individuals had a single lesion, of which 36.4% were malignant and 63.6 % were benign (p 0.001). CT had a sensitivity of 96 % to diagnose a malignant lesion, a specificity of 88.4 %, an accuracy of 95.78 %, a positive predictive value of 98.70 %, and a negative predictive value of 73.33 %. Table 2 describes the presence and absences of disease. It describes that the total number of true positive disease were 228 which was also detected on ultrasound. The false negative disease was 22 which was not detected by ultrasound but was present in the patients The table describes 8 false positive results while there were 3 false negative results. The table 2 describes the ratio of disease TP(228)TN(3)and FP(22)FN(8).

**Diagnostic Accuracy of Ultrasound**

	Disease Present	Disease Absent
True Positive	228	True Negative 3
False Negative	8	False Positive 22
Total	236	Total 25

**Table 2:** Table shows presence and absence of disease

The frequencies of hepatic masses are shown in Figure 1.



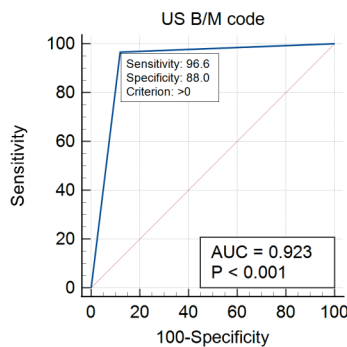
**Figure 1:** The graph shows the higher frequency of hepatic masses occurring between the age of 45 to 65

**Test validity parameters of CT-scan for diagnosis of malignant liver masses.**

<b>Sensitivity</b>	96. %	93.4% to 98.5%
<b>Specificity</b>	88.0%	68.7% to 97.4%
<b>AUC</b>	0.92	0.8 to 0.9
<b>Positive Likelihood Ratio</b>	8.05	2.7 to 23.2
<b>Negative Likelihood Ratio</b>	0.03	0.01 to 0.07
<b>Disease Prevalence</b>	90.4%	86.18% to 93.705%
<b>Positive Predictive Value</b>	98. %	96.3% to 99.54%
<b>Negative Predictive Value</b>	73.3%	57.8% to 84.65%
<b>Accuracy</b>	95.7%	92.58% to 97.87%

**Table 3:** Shows the sensitivity, specificity, prevalence, likelihood ratio and predictive value

CT had a sensitivity of 96 % to diagnose a malignant lesion, a specificity of 88.4 %, an accuracy of 95.78 %, a positive predictive value of 98.70 %, and a negative predictive value of 73.33 %.reported to find out the accuracy of ultrasound in hepatic masses.



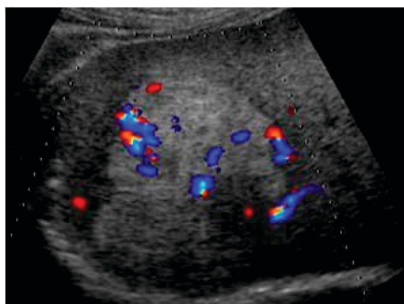
**Figure 2:** Value of ROC curve: AUC=0.923; p value<0.001

The diagonal segments are produced by ties  
The table 4 describes the HCC frequency(90%) higher than hemangioma(6.1%)and adenoma(3.8%).

CT Diagnosis	Yes	Frequency
Adenoma	10	3.8%
HCCH	235	90%
emangioma	16	6.1%
Total	261	100%

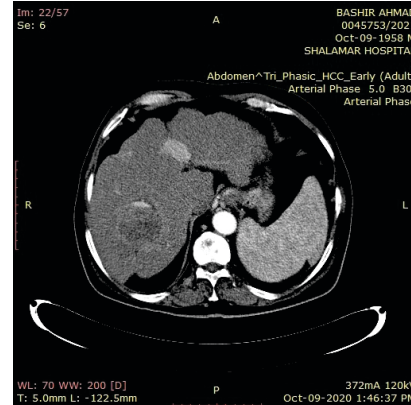
**Table 4:** Masses frequency

The ultrasound image of Hepatocellular carcinoma with vascularized hyperechoic mass is shown in figure 3. Figure 4 showed CT scan result of Hepatocellular carcinoma in the right lobe of liver.



**Figure 3:** Hepatocellular carcinoma with a vascularized

hyperechoic mass.



**Figure 4:** Axial image of CT scan showing HCC in right lobe in VIII segment of liver

**DISCUSSION**

Liver masses are getting more common among people when diagnosed with the imaging technology especially for the identification of abdominal conditions. Such liver masses can be benign or malignant depending on the diagnoses and identification for providing a specific patient care. Several imaging technologies can be used to identify liver or hepatic masses without any invasive techniques and diagnostic measures. According to study hepatic masses are more likely to be found in male as compared to female. The study showed that male to female ratio was 4:1. Additionally, it also described that HCC was more common between the 40 to 70 years of age [11-14]. According to our study in table 1 the male patients were more likely to have HCC when compared with females. Out of 261 patients 124 patients were female while males were 137. Our study also described that the age frequency was between 45 to 65. According to Jones et al., research described the risk factors and initial liver cancer in a study of more the 5 billion people [15]. The mean SD ratio for men were 11.1 with the age 43.9 years while for females the SD ratio was 12.3 with the age 44.1 years. This shows that females SD ratio was more when compared with male. According to our study the SD ratio for female were 17.6 while for male the SD ratio was 14.0. The results showed that the SD ratio of female with liver mass is more as compared to male. According to another study showed that out of 385 patients, 65 patients were having HCC (6.1%) which were benign and having hemangioma. Schwartz et al., study showed that not all HCC patients are having hemangioma, but it is also not necessary that HCC patients do not have hemangioma [16]. According to our study the frequency of HCC is more as compared to hemangioma and adenoma. The frequency of HCC is 90%, hemangioma is 6.1 and adenoma is 3.8%. Frequency of hemangioma is more than adenoma but less then HCC. Frequency of adenoma is

less comparative to HCC and hemangioma. A sum of 50 CT tests of the hepatobiliary framework were considered. Kang et al., found that CT showed 88% awareness and 98% explicitness in identifying threatening liver masses, as per [17]. Snow et al., done CT, USG, and scintigraphy in 94 patients with clinically thought SOL in the liver and found that CT was the most dependable in tracking down masses and assessing the general level of intrahepatic illness. In this examination, CT was uncovered to have 96% awareness, 86% explicitness, and 95% precision in recognizing threatening liver masses [18]. As per Parveen et al., studied the awareness, particularity, and exactness of CT check for distinguishing SOL. The responsiveness, explicitness, and precision of CT examine for recognizing SOL in liver were 95%, half, and 81%, separately [19]. As per studies, the awareness and explicitness of CT check for estimating the boundaries of harmless and dangerous liver injuries were 94 / 83 / 82 and 55 / 88 / 80, individually. Furthermore, the CT check exactness was 72 / 86 / 81 [20]. In any case, as per our discoveries, the explicitness of CT check for liver masses is 96 / 93 / 98 and the awareness is 88 / 68 / 97 percent. Moreover, CT check exactness for liver masses is 95 / 92 / 97 percent. These findings were nearly identical to those of the current investigation. Based on the current findings and the findings of other researchers, it is clear that CT scans are fitting and exact indicative imaging modalities for the recognizable proof of hepatic masses. This research has certain drawbacks. One of the drawbacks was that there were not enough patients in each of the three types of lesions. This is why we couldn't calculate ultrasound accuracy for each lesion separately.

## CONCLUSIONS

The results of the present study therefore concluded that CT is a useful modality for the diagnosis of malignant liver masses. Ultrasound had high sensitivity, specificity for the hepatic masses. females were more effected than males. Among hepatic masses, HCC is the commonest.

## Conflict of interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Ergonomic Risk Assessment among Private and Govt Middle School Children of Hayatabad, Peshawar: A Cross Sectional Survey

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## ARTICLE INFO

## Key Words:

Back Pain, Health Risk Assessment, Neck Pain, Physical Ergonomics, Posture Balance

## How to Cite:

Ullah, Z. ., Changez Khan, S. ., Akbar, K. ., Ali Shah, I. ., Ahmed, S. ., Bakht Khan, S. ., Zaun ul Abidin, S. ., Ali, I. ., & Ahmed, U. . (2022). Ergonomic Risk Assessment Among Private and Govt Middle School Children of Hayatabad, Peshawar: A Cross Sectional Survey: Ergonomic Risk Assessment among Private and Govt Middle School Children of Hayatabad. Pakistan Journal of Health Sciences, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.206>

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Received Date: 5th October, 2022

Acceptance Date: 5th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

Ergonomics is the study of fitting products for users and tasks to fit for humans. Compared to designing for children, designing for adults is simpler, but school-aged children are more susceptible to musculoskeletal problems and ergonomic risks. In Pakistani context, notably, nothing is known about ergonomic examinations in school-going youngsters. **Objective:** To determine and assess the ergonomic risks among private and government middle school children of Hayatabad, Peshawar. **Methods:** A cross sectional study was conducted in which 202 students participated. All the children studying in class 6<sup>th</sup> to 8<sup>th</sup> were recruited from different private and government middle schools of Hayatabad Peshawar. Ergonomic risk among all participants was assessed via standardized questionnaire called Rapid Upper Limb Assessment. Probability multistage sampling technique was utilized while data was analysed through SPSS version 25. Frequencies distribution, mean and standard deviation was calculated for descriptive variables, while chi square test was used to find out significant association between RULA scale and MSK pain. **Results:** A total of 202 students participated, ranging from 10-14 years with mean age of 12.4±1.4. Out of 202 participants only 78 participants reported MSK pain/discomforts. The most common reported painful region was the back 22 %. Most were within mild risk which was 50% followed by severe which was 13% of the total population. **Conclusions:** The most discomforting MSK region was the BACK followed by NECK. Pairing those with the RULA scale assessment scores, it was concluded that students were at risk of further MSK disorders if not acted upon.

## INTRODUCTION

Ergonomics is a science that aims to provide comfort to humans at workstations taking into account the human factors [1,2]. It is the scientific process of planning and designing products and places as well as procedures to align with the physical, mental, cultural and emotional capabilities as well as limitation of the target audience [3]. People generally think of ergonomics in terms of physical tasks like body position changes during an activity or change in physical arrangements such as correct positioning of tables and chairs or work place. Ergonomics

when viewed from the lens of equal opportunity makes it clear that it is unequivocally important and applicable to designing anything for anyone of any age. Professionals such as manufacturers of furniture, cars etc. especially in the case of children may not be aware of how to adequately design stuff because there are not a one size fits all formula i.e. each child develops in a different way. Similarly, typical workstations installed in schools are described as unsuitable for children [4]. Workstations in schools may contribute to musculoskeletal discomfort in school going

children which is a serious community health problem. During classroom lessons, children often sit with stooped posture, having their trunk, back, and neck flexed or rotated for long periods, with musculoskeletal symptoms arising from the classroom environment. According to the Hazard Identification Risk Assessment and Risk Control study, universal factors may influence the incidence of musculoskeletal pain in school children categorized into three main groups; a heavy schoolbag (>10% of body weight), not body friendly furniture design and incorrect sitting posture on the part of the student [5,6]. MSK complaints, such as low back pain, among school students are believed to be due to multiple causes [7,8]. School environment being one of the causes, because students almost spend thirty percent of their time in school in the sitting posture. Balaguett. Yeats and Troussier et al reported an increase in nonspecific low back pain when sitting on poorly designed furniture [5]. Studies have concluded that inconsistency between school furniture and body dimensions can cause msk disorders [2,9] and may influence learning activities including writing, reading and typing [10]. Lifetime prevalence of MSD in children and adolescents varies from 7% to 63% [7]. A study reported that the majority of school children (62%) had poor sitting posture while writing and reading. MSK regions affected due to poor posture were neck 61.3%, Shoulder 57%, abdominal region 49.2%, posterior region 54.5% and arm 72.3% [1,11]. Much international attention among the health related literature has been focused on interventional strategies to reduce the ergonomic risks related to school children which includes use of ergonomic furniture, posture correction, reduction of school bag weight i.e. < 15% of the body weight, health promotion packages and exercises to reduce muscle fatigue along with lack of exercise and lack of ergonomics awareness in the developed and developing countries is also a risk factor [5,12,13]. Evidence has reported 30-60% of school children self-reporting discomfort associated with wrong computer postures [14]. Linton et al., reported that to reduce musculoskeletal symptoms in school children, ergonomically designed chairs with curved seat must be used because these increase the angle between torso and thigh as well as enhance Lumbar curve [15,16]. Studies have concluded that inconsistency between school furniture and body dimensions can cause msk disorders [2,9], and may influence learning activities including writing, reading and typing [10]. Literatures were available nationally and internationally regarding ergonomics risk assessments among various employees. But, there was no such study among school children particularly, the middle school children. There is a lot of difference not only in educational system in Pakistan but even in infrastructure of each

school. Therefore, the aim of this study was to determine and assess the Ergonomic risk among middle school children of Hayatabad, Peshawar.

## METHODS

This study was descriptive cross-sectional study, conducted in Private and Government Middle schools of Hayatabad, Peshawar. Sampling was done via Probability multistage sampling technique and sample size of the study was 202 that was calculated by help of online sample size calculator (OpenEpi). The study was completed within six months after approval of proposal by ASRB, i.e. February 2021 to August 2021. All the children both male and female registered with the private and government middle schools in class 6th to 8th aged between 10 - 14 years and those attending their school regularly (< 60% attendance) were included in our study while children having any MSK discomfort before admission/promotion in the school determined via their medical records provided by their parents or guardians, children with any known systemic diseases. (Arthralgia, Arthritis, Myalgia etc) or those who have had any recent trauma such as Road Traffic Accident, History of falls etc. (trauma in the past 6 months) were excluded from our study. After the approval proposed study from graduate committee and Advance Study and Research Board (KMU) permission was taken from the concerned middle school principals through official permission letters for data collection. All the willing students were briefed about the purpose and procedure of this study and then an informed consent had been taken from them and their parents. The consented students had been screened through inclusion and exclusion criteria. Data were collected via questionnaire including demographic data and Rapid Upper Limb Assessment (RULA) Questionnaire that was used to assess ergonomic risk for musculoskeletal discomfort among school children with excellent validity and reliability [17]. RULA scale was mainly comprised of 4 categories (Negligible, Mild, moderate and severe) based on its scoring Children with score 1-2 were place in no risk category, similarly 3-4 were placed in category of low risk, while 5-6 in category of medium risk while on the other hand 6 plus were place in category of very high risk of MSK related issues. The data were analysed using SPSS (Statistical Package for Social sciences) version 20.0. On the basis of assessment, percentages and frequencies of five categories of (RULA) Rapid upper limb assessment scale i.e. negligible risk, low risk, medium risk and very high risk were developed and presented in the form of tables and graphs, a chi square test was used to find out significant association between RULA scale and MSK pain. Participants were informed verbally about the aims and objectives of my study.

Consent forms were given to the participants and explained to them by the interviewer. The subjects were given the right to quit from the research at any time due to any reason. It was assured to the participants that their name or address would be kept confidential. The participants were also informed that this research study result wouldn't harm them. It would not be disclosed and their information would only be shared with research supervisor

## RESULTS

A cross-sectional study was conducted to determine and assess the ergonomic risk among private and government middle school children of Hayatabad, Peshawar. We recruited total 202 students with a mean age of 12.4 (1.4). Out of total 77 (37.6%) of students having a maximum age were range in 12-13 yr. Out of 202 students, male ratio was greater than female, i.e. 103(51%) and 99(49%) respectively. The maximum number of students having normal BMI were (68.3%) followed by underweight category were (15.3 %.) The 124 students reported no MSK pain/discomfort and 78 students reported MSK pain/discomfort within different regions of the body. The most reported painful region was back (n=46) followed by neck (n=20) and arm (n=13). Based on RULA scale, the maximum number of students were suffering from mild pain(n=101)as shown in table 1.

Variables	Frequency (%)
<b>Age (yr)</b>	
10-11	61(29.8%)
12-13	77(37.6%)
14	64(31.2%)
<b>Gender</b>	
Males	103(51.0%)
Females	99(49.0%)
<b>BMI</b>	
Under-weight	31(15.3%)
Normal	138(68.3%)
Over-weight	33(16.3%)
<b>Class/Grades distribution</b>	
6.00	57(28.2%)
7.00	79(39.1%)
8.00	66(32.7%)
<b>MSK pain</b>	
Yes	78
No	124(61.3%)
<b>Region of Pain</b>	
Neck	20(9.9%)
Back	46(22.8%)
Arm	13(6.4%)
<b>RULA scale</b>	
Negligible	59(29.2%)
Mild	101(50.0%)
Moderate	14(6.9%)
Sever	28(13.9%)

**Table 1:** Shows basic demographic characteristics of participants

The association were checked between MSK pain and RULA scale, there was significant association between MSK pain and RULA scale ( $P < 0.05$ ) as shown in table 2.

RULA scale	MSK pain		Total	P-Value
	No	Yes		
Negligible	56	3	59	0.000
Mild	63	38	101	
Moderate	5	9	14	
Sever	0	28	28	
Total	124	78	202	

**Table 2:** Shows RULA categories and association with MSK pain

## DISCUSSION

In this study we have explored for various factors for MSK pain school going children ranging from 10- 15 years and its relationship with RULA score and classes. Total 202 participants from different school took part in this study, out of 202, participants of age group 10-11 years were 61, while with age of 12-13 years were 77, and with 14 years were 64, having mean of  $12.4 \pm 1.4$ . Out of total 202 children 124 (61.3%) had MSK pain. In comparison an investigation done in the Boston university, looking for backpacks and posture assessment took age classification from 9 to 14, having mean of  $12.7 \text{ years} \pm 0.52 \text{ years}$  that is some-what related to this study [18]. Another cross-sectional study performed in the New Zealand took the age group from 11-14 years showing mean age of  $12.02 \pm 0.59$  [19]. An examination was done, to teach youngsters and guardians about the utilization of right ergonomics and right span can limit the discomforts [18]. Studies uncovered the importance that MSK related issues and pain are prevalent in both youngsters, as well in children [20]. Out of all participants 124 showed having no pain, and 78 members revealed pain in various locales of the body that is neck=9.9%, back=22.8%, and arms=6.4%. The most announced area of pain was back=22.8%. Same type of study was done in university of putra, Malaysia showing devastating consequences of MSK related injuries with high rates of prevalence in neck and shoulder 38% and 16% regions respectively [1]. This high prevalence of pain may be due to different age group being taken in this Malaysian study, so there is the possibility that students from primary grade may not be able to hold backpacks correctly [1]. Another study took children of 11-17 years which revealed that most painful area is back with 20% of prevalence rate, matching with the results of our studies. Another cross-sectional was conducted in the Palmerston North area of New Zealand in which their investigation also showed predominance of back pain 34% and neck 27% respectively [19]. Another study has revealed that sitting on a normal stenographic chair having no back support increases the

flexion and compressive forces on the lumbar spine, thereby increasing the low back pain in children, which also support our study in terms high rates of low back pain [10]. Similarly, in our study we have explored the risk of MSK related pain with ergonomics by utilizing RULA scale, among 202 children most 101 were classified in mild category of RULA. Similarly, in other two of the international studies with school going children who had risk of MSK related pain, only 38 children lied in category MSK risk with other showing no pain and in another study with only 28 participants in mild category which also support the idea of least student showing Risk of MSK pain in association with RULA[4].

## CONCLUSIONS

The most discomforting MSK region was the BACK followed by NECK. Pairing those with the RULA scale assessment scores, it was concluded that students were at risk of further MSK disorders if not educated or measures were not taken to eradicate or even address this issue.

## Conflicts of Interest

The authors declare no conflict of interest.

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Evaluation of Ageism Attitudes of Clinical Physical Therapists

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## ARTICLE INFO

## Key Words:

Ageism, Attitudes, Knowledge, Clinicians, Physical Therapists

## How to Cite:

Noor, K. ., Khalid, T. ., Jabbar, S. ., Khalid Khan, A. ., Azam, H. ., Anwar, A. ., & Khalid Khan, U. . (2022). Evaluation of Ageism Attitudes Of Clinical Physical Therapists : Ageism Attitudes of Clinical Physical Therapists. Pakistan Journal of Health Sciences, 3(06). <https://doi.org/10.54393/pjhs.v3i06.304>

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Received Date: 28<sup>th</sup> November, 2022

Acceptance Date: 13<sup>th</sup> November, 2022

Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

Considering rising number of older people worldwide, provision of quality healthcare services has become matter of concern. Since, healthcare practitioners' attitudes towards ageism affect quality of the care provided to the older population. **Objective:** To evaluate the ageism attitude of clinical physical therapists towards older people. **Methods:** A cross sectional study was conducted at various public and private sector clinical settings in Faisalabad. 118 participants who were clinical physical therapists with at least one-year clinical experience, currently practicing and willing to participate were included. Geriatrics attitude scale and facts on aging scale were used as outcome measures. SPSS (V.24) was used for analyzing the data and results were interpreted using frequency tables and chi square. **Results:** The 83.1% participants belonging to age group 24-30 years while 79.7% were female physical therapists. 80.5% had been working for more than one year. Attitude was measured with GAS at once time. 68.5% of the people gave positive attitude toward older people. Knowledge was measured with FAQ scale at once time. 51.1% of the participants have maximum knowledge about older people. Interpretation of chi square showed there was no correlation between attitude and knowledge of the physical therapy clinicians ( $p > 0.05$ ). **Conclusion:** This study concluded that clinical physical therapists were bearing positive attitude towards older people being aware of the ageism facts. However, there was no correlation found between clinician's knowledge and ageism attitude.

## INTRODUCTION

Ageism is defined as stereotypes, prejudice and discrimination that is how we think, how one feels, how one acts toward the older people [1]. Ageism is about partiality against the older people or the association of negative attribution against the old people [2]. Aging is one of the most important demographic issue of the 21st century [3]. The older people are becoming one of the leading users of the health care resources that are present in the health care system. The increase in the number of older people have modified the family structure of the population and increase the need of the health care professional for them outside the family environment [4]. The rise in the elderly

population are being observed in the whole world and same kind of trends are present in Asia and also in Pakistan. A developing country like Pakistan who are facing many challenges that makes the life difficult and challenging for the elderly population like weak pension system, unsteady economic growth, instability in politics, less savings for elder people. In Pakistan, the medical needs and psychosocial needs are not properly filled. The limitations in the assessments of older people in Pakistan are due to lack of awareness about geriatrics, lack of support, carelessness and negative attitude towards the older people [5]. Over 2 million senior citizens were living in Pakistan in 1951

according to population census and the number increases in 1998 to 7.3 million. Today, the number of senior citizens in Pakistan are more than 20 million. The expectancy of life in Pakistan has increased over the last 3 decades and it is estimated to about 72 years by 20236. In Pakistan, the age of retirement from the job is 60years, the people who are beyond 60 years are considered as old. They do not get proper medications and healthcare services for themselves due to financially dependency on others [6]. In Pakistan, the older people are mostly dependent on the family financially and they have to seek help from the family members to meet their medical needs after retirement, this trend also plays role in decline of health status of the older people [7]. Geriatrics focuses on the health of the older people to improve their quality of life and to prevent the diseases and disabilities in them [6]. Physical therapist study geriatrics as part of their course work, a specialized area of medical field that is not even recognized in the Pakistan and nor practiced [8]. In Pakistan, the geriatrics is not recognized as a separate field and the old people are treated by the common practitioners and other specialists [9]. Health system of Pakistan is not fully developed and many areas of the field is neglected, geriatrics is one of them. The ignorance of the geriatrics affects the health of the older people in the Pakistan in a negative way [7]. With the increase in the age, the level of disability also increases. To deal with the increase in the disability, there is need of more physiotherapy consultants [9]. There is increase in the number of physical therapy clinicians across the country over the years. The attitude towards the older people depends on the culture of that particular society and vary from one culture to another. In some communities older people have high status and are treated with respect and in some communities older people are considered as useless and this negative attitude towards older people have adverse effect on their health. The increase in the number of older people increases the need of physiotherapists. The negative opinions of the physiotherapists towards the older people also have negative affect on their desires to treat the older people and to work with them [10]. The negative or positive attitude of the health care providers towards the older people affect the quality of care. The negative and wrong attitude of health care providers toward the elder population decrease the effectiveness of the health care services [11]. The physiotherapist's ignorance and generalization of the older people cause negativity in their behavior towards the older population. The physiotherapists who interact with the older people on the daily basis and have better communication have more positive attitude towards them as compared to the physiotherapists who do not interact with the older people

on daily basis. The physiotherapist with more positive attitude towards the older people can provide better rehabilitation to them to maintain and improve their health [12].

## METHODS

A cross sectional study design was used in this research. Data were collected from multiple hospitals and private physiotherapy clinics. Duration of 4 months was spanned to complete this study after seeking approval from the ethical committee of the University of Faisalabad. Both male and female practicing clinical physiotherapists with more than 1 year's experiences working in either public or private sector organizations were eligible in this study. Freshly graduated physical therapists, academicians and other healthcare providers were excluded. Sample size of 118 participants was calculated using Openepi sample size calculator. Non probability purposive sampling technique was used to access the study participants. First of all, participants were asked to give written consent form and demographic information. Two tools were used to measure the attitude and knowledge of the clinicians' physiotherapist about older people. One is GAS (geriatrics attitude scale) and second is FAQ (facts on aging scale). GAS is used to measure the participant's attitudes towards older people. GAS consists of 14 different questions with 5 grades; 1 is strongly disagree, 2 is somewhat disagree, 3 is neutral, 4 is somewhat agree and last one is strongly agree. FAQ is used to measure the participant's knowledge towards older people. It consists of 50 different questions about older people. It was knowledge based question with YES or NO options. SPSS (Version 24.0) was used for the purpose of data analysis. Qualitative variables were interpreted using frequency and percentage while quantitative variables were expressed using mean and standard deviation. The correlation between attitudes and knowledge of physical therapists was measured using chi-square test whereas  $p < 0.05$  was considered significant.

## RESULTS

Sociodemographic profile of the participants is shown in Table 1 where 60.2% of the participant was working on their private clinics, 9.3% of the participant was working on public set ups, 30.5% participant work on both public and private setups. 79.7% of the participant was female and 20.3% was male. 46.6% of the participant was done with their post-graduation.

Parameters	Frequency	Percent	
Gender	Male	24	20.3
	Female	94	79.7
	Total	118	100.0
Clinical setting	Public	11	9.3
	Private	71	60.2
	Both	36	30.5

	Total	118	100.0
Age Group	24-30	98	83.1
	31-35	19	16.1
	36-40	1	0.8
	Total	118	100.0

**Table 1:** Sociodemographic Characteristics of Participants

The descriptive statistics of both outcome measures is shown in Table 2 where the mean score of geriatric attitude scale (GAS) and facts on aging scale (FAQ) was interpreted along with standard deviation. 68.5% of the people give positive attitude toward older people ( $3.42 \pm 0.55$ ). 51.1% of the participants have maximum knowledge about older people based on FAQ questionnaire ( $0.51 \pm 0.07$ ). The interpretation of chi square test showed there was no correlation between attitude and knowledge of the physical therapy clinicians.

	Minimum	Maximum	Mean+SD	p-value
GAS	1.00	5.00	3.42+0.55	0.928
FAQ	0.38	0.72	0.51+0.07	
N	118			

**Table 2:** Descriptive Statistics of GAS and FAQ

## DISCUSSION

The study was conducted to evaluate the attitude of physical therapists towards the older population as the use of physical therapy services are increasing day by day and it is necessary to prepare the physical therapists to manage the increase demand of the services. The results of the study were comparable with the previous literature. Blackwood et al., conducted study in Turkey to evaluate the attitude of the physical therapy students towards the older population showed the mean UCLA-GA score was  $48.18 \pm 5.67$ . Female students demonstrated more positive attitude towards the elderly population ( $t = -1.983$ ,  $p < 0.05$ ). The students who were living with the old person shows more positive attitude as compared to others ( $t = 2.864$ ,  $p < 0.05$ ) [12, 13]. Another research conducted by Açıkgöz et al., in University of Sydney demonstrated similar results where result of the study showed students results 78.3% positive responses on the GAG scale with no change in over time ( $p = 0.56$ ). The initial responses on FAQ1 were 43.6% were correct that change with 51.7% over time ( $p = 0.0001$ ) [14]. The results of the study also coincide with the previous research conducted in Turkey to evaluate the attitude of students of rehabilitation towards the ageism. Bakirhan et al., study results showed that mean score on AAS was  $81.0 \pm 9.5$ . The mean scores of the "restricting life of elderly", "positive ageism", "negative ageism" were  $34.3 \pm 4.0$ ,  $28.7 \pm 5.2$ , and  $18.0 \pm 3.4$  respectively [15]. The female students have more positive attitude towards the older population. As majority of this study participants are females hence supported by the evidence. Another study was conducted to determine the attitude of physical therapists towards

the older people and the factor analyzing the have impact on the attitude of the physiotherapists towards the elderly population. The Kogan attitude towards Elderly scale and Jefferson Empathy Scale were used in the study. The average Kogan Attitude towards Elderly scale was  $M(SD) = 100.7(17.46)$ . Results of study augmented the evidence that the empathy is the factor that prevent the negative attitude of the physical therapist towards the older population [16-19]. While a research was carried out among different healthcare professionals and to determine the attitude of different health professionals towards the older population. This study suggests that the physicians have more negative attitude towards the older population as compared to nurses, therapists. The personal aging anxiety is also linked with more negative attitude towards the older population [20-23]. Current study did not compare the attitudes of physical therapists with other health care professionals, so the comparable attitude towards ageism could not be expressed.

## CONCLUSIONS

This study concluded that clinical physical therapists were bearing positive attitude towards older people being aware of the ageism facts. However, there was no correlation found between clinician's knowledge and ageism attitude.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Evaluation of Haematological Variables in Patients with Typhoid in Pakistan

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## ARTICLE INFO

## Key Words:

Typhoid, Leukocytosis, Thrombocytopenia, NLCR, Haematological Factors

## How to Cite:

Kashif Raza, S. . ., Javaid, H. ., Bajwa, H. ., Saleem, K. ., & Hashim, M. . (2022). Evaluation of haematological variables in patients with typhoid in Pakistan: Hematological Parameters in Patients with Typhoid. *Pakistan Journal of Health Sciences*, 3(06). <https://doi.org/10.54393/pjhs.v3i06.104>

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## ABSTRACT

Typhoid fever results in significant hepatic problems and biochemical abnormalities. The most effective diagnostic procedure now is the bacterial culture, but serologic tests are still often used, and a speedy and accurate diagnostic test for typhoid fever is still required. **Objectives:** To examine the haematological parameters between typhoid patients and healthy individuals to find any distinctive parameters that could be used as typhoid fever diagnostic indicators. **Methods:** This study set out to compare haematological changes in 550 patients with 550 healthy persons. **Results:** We found low hemoglobin (8.95±1.43), low hematocrit (32.62±5.38), high ESR (53.89±9.21), high platelet count (482003±86792), high WBCs count (14464±1694), high neutrophil percentage (63.60±9.26), low lymphocyte percentage (25.33±2.93), and high NLCR (2.498±0.45) against the healthy control group. **Conclusions:** This distinctive pattern can be easily obtained using a minimally invasive method and used to diagnose typhoid fever.

## INTRODUCTION

A widespread bacterial infection known as typhoid fever is brought on by *Salmonella typhi*. It is a contagious illness that spreads orally and is brought on by ingesting contaminated food and drink by the faces or urine of infected persons[1]. Typhoid typically presents with fever, headache, stomach pain, relative bradycardia, and splenomegaly as its initial symptoms[2]. The first week is characterized by toxicity, high fever, and constipation; the second week is characterized by diarrhea; the third week is characterized by splenomegaly, bone marrow findings, and other complications such intestinal bleeding and perforation[3]. Typhoid annually results in 16.6 million new infections and 600,000 fatalities, making it a major cause of illness and mortality globally. Nearly 80% of cases and fatalities take place in Asia. Although the prevalence has

been declining, rare outbreaks sometimes happen, especially during the hot months[4-6]. Only human being can transmit typhoid disease, and low- and middle-income nations have the highest risk of infection with endemic typhoidal *Salmonella*, inadequate sanitation, and limited access to safe food and water [7]. The majority of Typhi infection serotypes are identified solely based on clinical criteria and are presumed to be treatable. Typhoid fever presents with a variety of symptoms that are similar to those seen with other febrile illnesses in many places where this disease is common, making a clinical diagnosis challenging [8]. *Salmonella enterica* serotype Typhi must be isolated and identified in a lab to treat typhoid disease. The most reliable way to determine whether you have an infection is to isolate *Salmonella* from your blood, urine, or

stool[9]. The typical diagnostic procedure is blood culture, which is successful in 60 to 80% of cases [10]. However, patients frequently use antibiotics in our nation before receiving a medical diagnosis, therefore only 40% to 60% of the time bacteria can be isolated from blood cultures. After the first week, the likelihood of a positive blood culture declines, and the fourth week is when it turns negative [11]. Stool culture is also a crucial technique for locating; whenever a blood culture is negative, it might be certain. Although using a duodenal string to culture the upper GI tract can be helpful, people do not respond well to the operation[10,12]. Typhoid fever can be diagnosed and its prognosis evaluated using haematological abnormalities[13,14]. The goal of this study was to examine the haematological parameters between typhoid patients and healthy individuals to find any distinctive parameters that could be used as typhoid fever diagnostic indicators.

## METHODS

A cross-sectional study was conducted on a total of 1100 people, 550 with typhoid fever and 550 healthy controls. Only individuals whose diagnosis of typhoid fever was confirmed based on the typhidot test were included in the study. Their venous blood was drawn into plain vacutainers for the serum and vacutainers containing EDTA for whole blood. Since this is a retrospective, patient consent was not requested. Typhidot tests were performed on serum samples after centrifuging for 10 minutes at 6000 rpm at 4°C [15,16]. Blood culture media was mixed with 5 ml of the patient's blood, and the blood culture bottles were incubated for 7 days at 37°C. The subculturing of broth was performed on blood agar and MacConkey agar after 48 and 72 hours. The following day, by employing gram staining and traditional biochemical methods, isolates were identified. The modified Kirby-Bauer disc diffusion method was used for assessing the susceptibility to ampicillin (17 mm), chloramphenicol (18 mm), ceftriaxone (21 mm), tetracycline (19 mm), ofloxacin (16 mm), norfloxacin (17 mm), ciprofloxacin (21 mm), and nalidixic acid (19 mm). Gentamicin were used to treat the strains that are resistant to ampicillin and trimethoprim (15 mm) [17,18]. Utilizing the TyphiDot (CTK) quick diagnostic kit finds IgM or IgG antibodies in patient's samples. CRP levels were determined utilizing an Aeroset 2.0 analyzer and an automated enzyme-linked immunoassay (ELISA) (Abbott Diagnostics, USA). A Sysmex XE-2100 hematology analyzer was used to perform CBC (Sysmex Corporation, Kobe, Japan). By division of the neutrophil percentage by the lymphocyte percentage, the neutrophil to lymphocyte cell ratio (NLCR) was determined [7]. Hematocrit, platelet, hemoglobin, erythrocyte sedimentation rate (ESR), lymphocyte, WBCs, and neutrophil percentage, and NLCR

are among the hematological markers included. Data visualization and statistical analysis were carried out using GraphPad Prism 9, and t test was performed to see if there was a significant statistical difference between patient and control group.

## RESULTS

This study enrolled 550 patients and 550 healthy adults at District Headquarters Hospital and Allied Hospital, Faisalabad. The predominant clinical symptoms in typhoid patients at the time of sample collection were fever, toxic and sick appearance, relative bradycardia, anemia, abdominal tenderness, hepatomegaly, splenomegaly, and jaundice. Graphical presentation of all parameters is provided in the form of box plot graph (Figure 1). In typhoid patients, hemoglobin levels were found to be low (mean  $\pm$  SD,  $8.95 \pm 1.43$ ) against the healthy control group ( $12.48 \pm 1.82$ ). The hematocrit level was found to be low ( $32.67 \pm 5.38$ ) versus a healthy control group ( $39.21 \pm 3.61$ ). The ESR readings of those suffering from typhoid fever differed significantly from those of the control group. The mean ESR value in typhoid patients was high ( $53.89 \pm 9.21$ ) in comparison to healthy control group ( $13.99 \pm 6.13$ ).

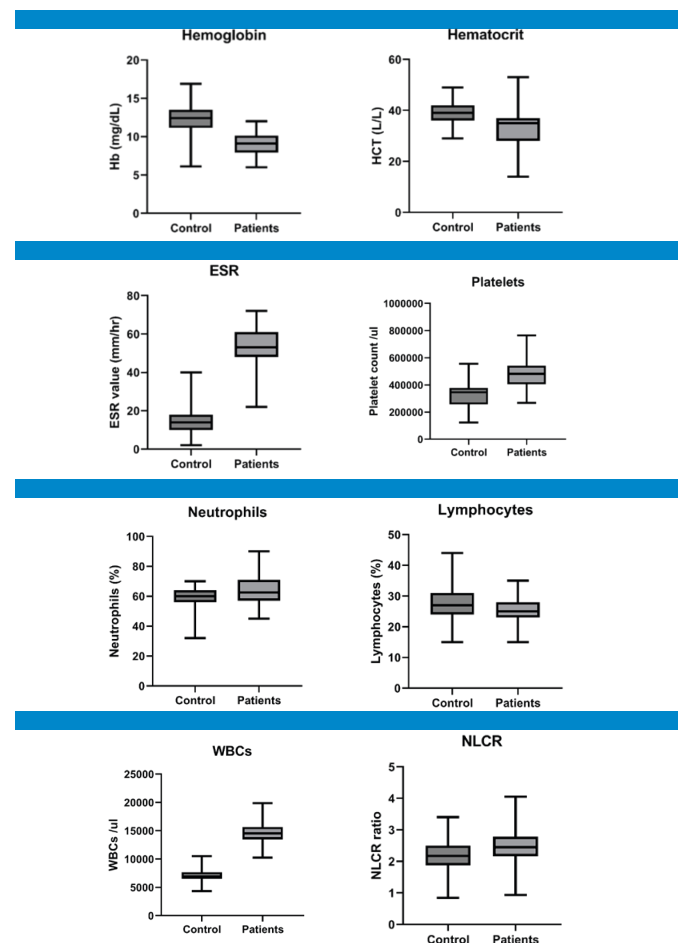


Figure 1: Graphical presentation of hematological parameters.

Typhoid patients have a high platelet count ( $482003 \pm 86792$ ) when compared to the healthy group ( $310502 \pm 80433$ ). Similarly, the WBC count was considerably higher in the research ( $14464 \pm 1694$ ) in contrast to a healthy control group ( $1721 \pm 1245$ ). In typhoid patients, the neutrophil percentage was high ( $63.60 \pm 9.26$ ) against the healthy group ( $59.76 \pm 6.29$ ), and the percentage of lymphocytes in the study was lower; ( $25.33 \pm 2.93$ ) and ( $28.01 \pm 4.81$ ) in typhoid patients versus a healthy comparison group. NLCR ratio in typhoid fever was high ( $2.5 \pm 0.45$ ) against the healthy group ( $2.2 \pm 0.44$ ). With a p-value of 0.05, the results of all haematological parameters were statistically significant.

## DISCUSSION

Typhoid fever is a multi-stage, complex condition that has several stages. Bacteria invade macrophages and spread throughout the reticuloendothelial system during the asymptomatic incubation phase. Hematological problems, such as anemia, thrombocytopenia, eosinophilia, and disseminated intravascular coagulation (DIC), are usually brought on by typhoid fever. Hemophagocytosis and bone marrow suppression are just two of the mechanisms involved in the creation of these haematological changes. In normal practice, older markers including C-reactive protein (CRP), neutrophil differential count, and WBCs are still the most often used markers of infection to identify typhoid fever. Numerous haematological parameter abnormalities were discovered in comparison to the healthy control. According to a paper by Eissa et al. among typhoid patients, platelets count was considerably higher in patients with typhoid fever than in the control group. Like that, these typhoid patients had high ESR values. In 2015, 100% of cases with Salmonella myocarditis were reported with the same high ESR levels. According to the earlier report, also patients' hemoglobin levels were lower than normal in this current study. We discovered that typhoid patients had higher leucocyte counts. Additionally, in the differential leucocyte count, patients had high neutrophil percentages and low lymphocyte percentages. Previous studies have found that under a variety of stressful circumstances, neutrophil levels rise while lymphocyte counts fall. Increased neutrophil numbers are caused by demargination, delayed neutrophil apoptosis, and growth factors' activation of stem cells, whereas lymphocytopenia is caused by lymphocyte redistribution, margination within the lymphatic system, and is distinguished by an increase in apoptosis. Following their discovery of the clinical utility of lymphocytopenia as a marker to diagnosis bacteremia in emergency rooms, Wyllie et al. concluded that lymphocytopenia is a predictor of bacteremia in typhoid fever patients as well. In many

clinical circumstances, the NLCR parameter has been discovered to be a rather straightforward marker. Additionally, when compared to the neutrophil, WBC, and CRP levels, this measurement has been used to predict bacteremia in infectious emergency admissions as a simple infection marker. In addition, individuals admitted with Salmonella Typhi infection had higher NLCR levels. By demonstrating that typhoid fever patients have a significant level of this marker, and that it may help with typhoid diagnosis as well as later evaluation of the prognosis and severity of typhoid fever, our work contributes to previous findings. The NLCR can be calculated easily and doesn't need any additional testing. Applying the NLCR can be done with the help of metrics that are already available, such as the WBC count, neutrophil, and lymphocyte percentages from the CBC count. With the NLCR, typhoid diagnosis is substantially more beneficial. This research has several restrictions. Firstly, since this study was conducted only in Faisalabad, the results need also be confirmed in other cities. Secondly, more research on typhoid fever needs to be done in a different prospective validation study with more patients. Thirdly, malnutrition, factors that trigger apoptosis or can influence cell maturation due to bone marrow hypoplasia are only a few of the numerous factors other than infection that can cause lymphocytopenia. Future research should take this issue into consideration since it was not perceived by study participants as a complicating factor for lymphocytopenia in our study. Fifth, the best method for identifying typhoid fever was positive blood cultures. However, getting the right volume of blood for culture and timing blood samples in relation to the start of antibiotic treatment are also error-prone aspects of blood culture. Additionally, this retrospective analysis did not assess compliance with the blood sample protocols outlined in local lab manuals; this compliance must now be assessed in a prospective validation study. These markers are inexpensive and simple to incorporate into routine practice, and aid in making the diagnosis as well as predicting morbidity and assisting with management strategy. The haematological alterations and liver involvement, despite their great incidence and seriousness, are only temporary. Typhoid infection can be identified using lymphocytopenia. Additionally, the NLCR has even greater relevance in the diagnosis of typhoid fever. This marker is straightforward, simple to calculate and obtain, simple to integrate into daily practice, and free of additional fees.

## CONCLUSIONS

Significant changes in haematological parameters are caused by typhoid disease. Platelet count, ESR, and WBC



count were all above average. Both hematocrit and hemoglobin were below the normal range, and high neutrophil percentage and low lymphocyte percentage led to elevated NLCR in typhoid fever patients. Typhoid fever can be diagnosed using this distinguishing pattern of haematological data, which is simple to get by a minimally invasive method.

### Conflicts of Interest

The authors declare no conflict of interest

### Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Evaluation of the Frequency and Severity of Peripheral Artery Disease using Ankle Brachial Index among Patients Undergoing Coronary Angioplasty

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## ARTICLE INFO

## Key Words:

Coronary angioplasty and coronary artery disease

## How to Cite:

Ahmed, Z. ., Ishaque Shaikh, S. ., Ahmed, S., Ur Rehman, A. ., Baqai, L. ., Ali, M. ., Kanwal, M. ., & Majid, K. . (2022). Evaluation of the Frequency and Severity of Peripheral Artery Disease Using Ankle Brachial Index among Patients Undergoing Coronary Angioplasty: Evaluation of Peripheral Artery Disease among Patients with Coronary Angioplasty. *Pakistan Journal of Health Sciences*, 3(06). <https://doi.org/10.54393/pjhs.v3i06.324>

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Received Date: 5<sup>th</sup> November, 2022Acceptance Date: 14<sup>th</sup> November, 2022Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

One of the important markers for the risk stratification of patients with coronary artery disease is peripheral artery disease (PAD). **Objective:** To define the severity and frequency of peripheral artery disease using ABI among patients undergoing coronary angioplasty. **Methods:** The cross-sectional study was conducted at department of adult cardiology Tabba Heart Institute Karachi, Pakistan. This research was conducted for the duration of 6 months from 10th Dec 2019 to 10th June 2020. 120 patients met the inclusion criteria. They were admitted to the department of adult Cardiology. In all cases, patient's detailed history was taken after taking informed and written consent. The ankle brachial index (ABI) was calculated as per the operational definition to reach the outcome PAD and its severity. **Results:** A total of 120 patients undergoing coronary angioplasty were included. 89 (74.2%) were males & 31 (25.8%) were females with the mean age of 58.89±10.190 years. The PAD was seen in 9 patients (7.5%) and the severity of PAD was severe in 0(0%) patients, mild in 6(5%), and moderate in 3(2.5%). **Conclusions:** In conclusion, peripheral artery disease of the lower leg is not much frequent in patients receiving percutaneous coronary intervention with coronary artery disease but it is associated with disease severity and it & its severity increases with the increase in age and predominant in male gender. The peripheral artery disease severity is also significantly associated with body mass index & obesity.

## INTRODUCTION

One of the important markers for the risk stratification of patients with coronary artery disease is peripheral artery disease (PAD) [1, 2]. The higher risk of cardiovascular events is associated with this condition. Different studies have reported the co-occurrence of peripheral arterial disease and coronary artery disease. Moreover, the increased incidence of the multivessel and obstructive coronary artery disease are also linked to the PAD [3]. This relationship doesn't depend on the other cardiovascular risk factors [4, 5]. The patients diagnosed with the symptomatic or asymptomatic PAD are more prone to the development of cardiovascular disease. The mortality cases are also observed to be greater in such patients.

Therefore, the diagnosis of the patient's having symptomatic and asymptomatic PAD is considered as the crucial prognostic factor [6, 7]. The intermittent claudication is the commonly observed symptom of PAD. The ankle brachial index is used to calculate the incidence and prevalence of the symptom. It is observed that the asymptomatic PAD is several times more common. The incidence and prevalence of PAD are highly associated with the age. It rises to greater than 10% among the patients of age range between 60 to 70 years. The studies have suggested that the PAD will be 10 times more common in the future. It is more prevalent in man than woman for more severe or symptomatic disease [8]. The ratio of the

systolic blood pressure at the ankle to that in the arm is called as ABI. The lower values of ABI depict that there is atherosclerosis in the leg. For the diagnosis of the PAD the ABI is highly used. ABI had clinical and epidemiological application. It helps to diagnose both symptomatic and asymptomatic PAD [9, 10]. The poor prognosis of peripheral arterial disease is observed among the patients undergoing PCI. A study reported prevalence of PAD, as  $\leq 0.90$  as 12.8% among the patients undergoing PCI for CAD. This value was calculated by the ankle-brachial pressure index [11]. There is paucity of local data on frequency of patients with PAD among the patients with CAD undergoing coronary angioplasty [12, 13]. And due to diversified socioeconomic background and varying degrees of risk profile of our population we expect to see variation in our data compared to the data from other parts of the world.

## METHODS

According to the Inter-Society Consensus for the Management of Peripheral Arterial Disease, guidelines for the ABI was defined:

$$\text{Ankle brachial index (ABI)} = \frac{\text{(Highest systolic blood pressure of the 2 ankle)}}{\text{(Highest systolic blood pressure of the both arms)}}$$

PAD was labelled as "Yes" for the patients with  $\text{ABI} \leq 0.9$  otherwise will be labelled as "No". The severity of PAD was defined as; Sample size was calculated using WHO sample size calculator 12.8% frequency of peripheral arterial disease (PAD) among the patients undergoing coronary angioplasty, with 95% confidence level, margin of error (d) of 6% [14, 15]. The sample size was calculated as 120. The non-probability and consecutive sampling technique was used. According to the inclusion criteria following patients were selected for the study; Patients with the age range between 18 to 80 years, Patients were added irrespective of gender male and female both were added and Patients that visited the hospital for undergoing Coronary Angioplasty. The patient with history of peripheral arterial disease (PAD) and cardiac related disease were excluded. CPSP approved the study. The Tabbah Heart Institute ethical committee approved the study. The principal investigator conducted the verbal informed consent from all patients. Before undergoing Coronary Angioplasty, patients were asked to be seated and rest for 10 min before taking blood pressure reading. Systolic blood pressures of the 2 ankle arteries of that limb (either the dorsalis pedis or the tibial artery) and 2 upper limbs was obtained. The ankle brachial index (ABI) was calculated. Peripheral arterial disease (PAD) and its severity was recorded for the patients as per the operational definitions. All data were recorded on a pre-designed proforma (provided in annexure A). The SPSS tool was used for the analysis of the collected data. Effect modifiers like gender, age group, family history, smoking,

obesity and dyslipidemia was controlled through stratification. The fisher exact test was performed.

## RESULTS

A total of 120 patients undergoing coronary angioplasty were selected to conduct this study. The mean age was  $58.89 \pm 10.190$  years. The mean height was  $163.98 \pm 11.630$  cm. The mean weight was  $73.63 \pm 12.349$  kg as shown in table 1.

Statistics	Age (Years)	Height (cm)	Weight (kg)	BMI (kg/m <sup>2</sup> )
Minimum	36	97	49	18.30
Maximum	80	188	115	34
Mean	58.89	163.98	73.63	26.3233
Std. Deviation	10.190	11.630	12.349	2.3630

**Table 1:** Statistical description of age, height, weight and BMI

In our study 89 patients (74.2%) were males & 31 patients (25.8%) were females. The indication of PCI was seen ACS in 94 patients (78.3%) while non-ACS in 26 patients (21.7%). In our study peripheral arterial disease was seen 9 patients (7.5%). The peripheral arterial disease severity was mild in 6 patients (5%), moderate in 3 patients (2.5%) and severe in 0 patients (0%) as shown in table 2.

Severity of peripheral arterial disease	Frequency (%)
Mild	6 (5%)
Moderate	3 (2.5%)
Severe	0 (0%)
Total	9 (7.5%)

**Table 2:** Frequency distribution of severity of PAD

In our study the severity of peripheral arterial disease was associated with BMI but was not statistically linked with the age, gender, indication of PCI, hypertension, family history, smoking & dyslipidemia with P-value of 0.001, .275, .571, 0.560, 0.343, 0.635, 0.257, 0.275, 1.000, & 0.571 as shown in table 3.

Age (years)	Peripheral Arterial Disease		Total	P-value	
	Yes	No			
18-50	2(1.7%)	25(20.8%)	27(22.5%)	.0983	
51-80	7(5.8%)	86(71.7%)	93(77.5%)		
Total	9(7.5%)	111(92.5%)	120(100%)		
Age (years)	Severity of peripheral arterial disease			Total	P-value
	Mild	Moderate	Severe		
18-50	2(1.7%)	0(0%)	0(0%)	2(1.7%)	0.257
51-80	4(3.4%)	3(2.4%)	0(0%)	7(5.8%)	
Total	6(5.1%)	3(2.4%)	0(0%)	9(7.5%)	
Gender	Peripheral Arterial Disease		Total	P-value	
	Yes	No			
Male	7(5.8%)	82(68.3%)	89(74.2%)	.0797	
Female	2(1.7%)	29(24.2%)	31(25.8%)		
Total	9(7.5%)	111(92.5%)	120(100%)		
Gender	Severity of peripheral arterial disease			Total	P-value
	Mild	Moderate	Severe		
Male	1(0.85%)	1(0.85%)	0(0%)	2(1.7%)	0.571
Female	5(4.1%)	2(1.7%)	0(0%)	7(5.8%)	
Total	6(5.1%)	3(2.4%)	0(0%)	9(7.5%)	

BMI (kg/m <sup>2</sup> )	Peripheral Arterial Disease		Total	P-value	
	Yes	No			
18.1-26	0(0%)	61(50.8%)	61(50.8%)	.0002	
26.1-34	9(7.5%)	50(41.7%)	59(49.2%)		
Total	9(7.5%)	111(92.5%)	120(100%)		
BMI (kg/m <sup>2</sup> )	Severity of peripheral arterial disease			Total	P-value
	Mild	Moderate	Severe		
18.1-26	0(0%)	0(0%)	0(0%)	0(0%)	0.001
26.1-34	6(5.1%)	3(2.4%)	0(0%)	9(7.5%)	
Total	6(5.1%)	3(2.4%)	0(0%)	9(7.5%)	
Indication of PCI	Peripheral Arterial Disease		Total	P-value	
	Yes	No			
ACS	7(5.8%)	87(72.5%)	94(78.3%)	.0966	
Non-ACS	2(1.7%)	24(20%)	26(21.7%)		
Total	9(7.5%)	111(92.5%)	120(100%)		
Indication of PCI	Severity of peripheral arterial disease			Total	P-value
	Mild	Moderate	Severe		
ACS	1(0.85%)	1(0.85%)	0(0%)	2(1.7%)	0.560
Non-ACS	5(4.1%)	2(1.7%)	0(0%)	7(5.8%)	
Total	6(5.1%)	3(2.4%)	0(0%)	9(7.5%)	
Diabetes mellitus	Peripheral Arterial Disease		Total	P-value	
	Yes	No			
Yes	4(3.3%)	56(46.7%)	60(50%)	.0729	
No	5(4.2%)	55(45.8%)	60(50%)		
Total	9(7.5%)	111(92.5%)	120(100%)		
Diabetes mellitus	Severity of peripheral arterial disease			Total	P-value
	Mild	Moderate	Severe		
Yes	2(1.7%)	2(1.7%)	0(0%)	4(3.3%)	0.343
No	4(3.4%)	1(0.85%)	0(0%)	5(4.2%)	
Total	6(5.1%)	3(2.4%)	0(0%)	9(7.5%)	
Hypertension	Peripheral Arterial Disease		Total	P-value	
	Yes	No			
Yes	5(4.2%)	68(56.7%)	73(60.8%)	.0736	
No	4(3.3%)	43(35.8%)	47(39.2%)		
Total	9(7.5%)	111(92.5%)	120(100%)		
Hypertension	Severity of peripheral arterial disease			Total	P-value
	Mild	Moderate	Severe		
Yes	3(2.5%)	1(0.8%)	0(0%)	4(3.3%)	0.635
No	3(2.4%)	2(1.8%)	0(0%)	5(4.2%)	
Total	6(5.1%)	3(2.4%)	0(0%)	9(7.5%)	
Family history	Peripheral Arterial Disease		Total	P-value	
	Yes	No			
Yes	2(1.7%)	28(23.3%)	30(25%)	.0841	
No	7(5.8%)	83(69.2%)	90(75%)		
Total	9(7.5%)	111(92.5%)	120(100%)		
Family history	Severity of peripheral arterial disease			Total	P-value
	Mild	Moderate	Severe		
Yes	2(1.7%)	0(0%)	0(0%)	2(1.7%)	0.275
No	4(3.3%)	3(2.5%)	0(0%)	7(5.8%)	
Total	6(5.1%)	3(2.4%)	0(0%)	9(7.5%)	
Smoking	Peripheral Arterial Disease		Total	P-value	
	Yes	No			
Yes	2(1.7%)	32(26.7%)	34(28.4%)	.0672	
No	7(5.8%)	79(65.8%)	86(71.7%)		
Total	9(7.5%)	111(92.5%)	120(100%)		

Smoking	Severity of peripheral arterial disease			Total	P-value
	Mild	Moderate	Severe		
Yes	4(3.3%)	3(2.4%)	0(0%)	7(5.7%)	0.257
No	2(1.8%)	0(0%)	0(0%)	2(1.8%)	
Total	6(5.1%)	3(2.4%)	0(0%)	9(7.5%)	
Dyslipidemia	Peripheral Arterial Disease		Total	P-value	
	Yes	No			
Yes	3(2.5%)	33(27.5%)	36(30%)	.0821	
No	6(5%)	78(65%)	84(70%)		
Total	9(7.5%)	111(92.5%)	120(100%)		
Dyslipidemia	Severity of peripheral arterial disease			Total	P-value
	Mild	Moderate	Severe		
Yes	2(1.7%)	1(0.8%)	0(0%)	3(2.5%)	1.000
No	4(3.3%)	2(1.7%)	0(0%)	6(5%)	
Total	6(5.1%)	3(2.4%)	0(0%)	9(7.5%)	
Obesity	Peripheral Arterial Disease		Total	P-value	
	Yes	No			
Yes	7(5.8%)	22(18.3%)	29(24.2%)	.0001	
No	2(1.7%)	89(74.2%)	91(76.8%)		
Total	9(7.5%)	111(92.5%)	120(100%)		
Obesity	Severity of peripheral arterial disease			Total	P-value
	Mild	Moderate	Severe		
Yes	5(4.3%)	1(0.7%)	0(0%)	6(5%)	0.571
No	1(0.75%)	2(1.75%)	0(0%)	3(2.5%)	
Total	6(5%)	3(2.4%)	0(0%)	9(7.5%)	

**Table 3:** Peripheral Arterial Disease and its severity

## DISCUSSION

According to the previous studies the prevalence of peripheral artery diseases ranges from 5% to 40% in the patients undergoing PCI for CAD [16]. The highly diverse demographic population background of patients and the CAD manifestation ultimately leads to the highly wide range of PAD. The prevalence of unknown CAD significantly increased with the diabetes mellitus. There is no association of myocardial infarction with the higher rate of PAD. According to a study, the factors which are considered as independent predictors of PAD are the current or former smoking and older age [17, 18]. In the IPSILON cohort the PAD prevalence was reported to be 27.8%. The prevalence of peripheral artery disease ranges from 10.4% in patients with a high-risk cardiovascular profile to approximately 38% in patients with PAD symptoms. The PAD has a poor prognosis in patients undergoing percutaneous coronary intervention or stable coronary artery disease. According to a study conducted by group of scientists it was reported that the prevalence of PAD is 12.8% among patients undergoing percutaneous coronary intervention for CAD on the basis of ankle-brachial pressure index of 0.90 [19]. Another study found that the peripheral artery disease is observed in the 26.6% of patients diagnosed with CAD had (ABI 0.90), while 16.2% were asymptomatic [20]. In many patients approximately 0.8% of cases with an ABI less than 0.5 has the moderate level of peripheral artery disease severity in only. The high

prevalence (27%) of unknown PAD is reported in another study. This is consistent with earlier estimates that used ABI measurement (30–40%). It is higher than estimates. It is solely based on the clinical findings (10%). The higher short- and long-term mortality is reported in the patients with coronary artery disease and peripheral arterial disease who undergo percutaneous coronary intervention. The procedural success is also lower in such cases. The subset of patients especially those who are vulnerable to these diseases can be identify by the widespread use of ABI measurement. Indeed, one-year outcomes are worse in CAD patients with PAD than in those without PAD. According to previous studies the peripheral arterial disease in coronary artery disease patients is associated with increased disease severity [21]. The increased rate of mortality after PCI are observed in the previous studies. The findings recommend that there is need to improve the process of risk factor detection and management procedure of PAD patients. Our study has a small sample size. There is need to conduct large sample size study.

## CONCLUSIONS

In conclusion, peripheral artery disease of the lower leg is not much frequent in patients receiving percutaneous coronary intervention with coronary artery disease but it is associated with disease severity and it & its severity increases with the increase in age and predominant in male gender. The severity of peripheral artery disease is also significantly associated with body mass index & obesity.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Feto-Maternal Outcomes of Laboring Patients in Booked and Unbooked Patients

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## ARTICLE INFO

## Key Words:

Booking; Pregnancy Complications; Maternal Mortality; Maternal Outcome

## How to Cite:

Ghafoor, M., Irum Qureshi, Q. ., Soomro, S. ., Shah, F. ., Mughis, A., & Maqsood, Z. . (2022). Feto-Maternal Outcomes of Labouring Patients in Booked and Unbooked Patients: Feto-Maternal Outcomes of Laboring Patients. *Pakistan Journal of Health Sciences*, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.291>

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## ABSTRACT

The main factor contributing to poor feto-maternal outcomes is lack of antenatal care and awareness among pregnant ladies for need of booking in hospitals for their delivery management. Up to 39% of all obstetric patients in underdeveloped countries are hospitalized due to complications of labor, and same is case with neonates. **Objective:** To determine the association between patient booking status and outcomes because high maternal morbidity and mortality rates are indicative of the poor state of health services. **Methods:** A total of 380 patients, 190 booked patients admitted in emergency and 190 unbooked patients with fetal and maternal problems were included. The demographic data of each patient were recorded to determine the fetomaternal outcomes. **Results:** Different causes of obstructed labour such as CPD (60.62%), malpresentation (17.98%), and malposition (23.34%) were recorded in patients. In booked patients, 9.47, 3.15, and 5.78% of wound infection, anaemia, and ruptured uterus were recorded, respectively, while 11.05, 4.73, and 6.84%, respectively in unbooked patients. Among booked patients, 80.52% had maternal complications while 95.26% of unbooked had complications. Fetomaternal is a disorder that can be avoided and is common in underdeveloped nations. The majority of patients were unscheduled patients who did not obtain adequate antenatal care and as a result, showed up late in advanced labour with obstructive symptoms. CPD was the most typical reason for labour obstruction. **Conclusions:** Puerperal pyrexia was the most frequent maternal consequence, followed by PPH and UTI. Birth asphyxia was the most frequent prenatal consequence, followed by neonatal infection.

## INTRODUCTION

Pregnancy is one of the most significant life events for women, their families, and society as a whole, our nation's healthcare system gives pregnant women exceptional care. For the majority of couples, having a child is a joyous experience, but it could also go wrong and pose a serious threat to the mother's life [1-3]. An issue can be avoided with proper prenatal monitoring during the first pregnancy. Poor perinatal outcomes and high maternal morbidity and mortality rates are caused by common complications we see in our unbooked primigravida patients. All of these issues are preventable and can be avoided by having well-

planned and monitored labour and puerperium as well as excellent antenatal monitoring. 52.6% of women in poor nations experience problems during labour and puberty [4, 5]. Antenatal services are particularly important since they not only represent a woman's access to appropriate healthcare but also because prompt specialist consultations can guarantee that any issues that may arise during childbirth are recognized and treated effectively [6-8]. Since antenatal care has been around for 100 years, it has become one of the most important services offered by the healthcare system. Antenatal care is meant to keep



track of and enhance the mother's and foetus' health. Early booking, adequate prenatal care, and skilled labour and delivery can all improve obstetric and perinatal outcomes. Poor prenatal outcomes and maternal problems result from underusing antenatal and delivery care services [9-11]. Pre-eclampsia rates were much higher in unbooked cases (16.6%) compared to booked cases (8.6%), according to a local study. Pregnancy and delivery problems kill more women of reproductive age in developing nations like ours than in industrialized nations, where the death rate is less than 1% [12]. Better resources, services, and equitable allocation could prevent this. Maternal mortality has developed into a public health issue that requires immediate, coordinated, and efficient intervention at all societal levels [13-16]. Poor socioeconomic conditions of the patient and non-use of antenatal and delivery care services are strongly linked to maternal difficulties and poor perinatal outcomes, with unbooked patients having worse outcomes than booked patients. For this purpose, the current research was conducted in the study area.

## METHODS

A prospective observational study was done in a private hospital of Dera Ismail Khan, Khyber Pakhtunkhwa (KPK), Pakistan from April 2021 to April 2022. This study included 380 female patients—190 booked patients (patients with more than 28 days of target treatment date) and 190 unbooked patients (patients within 28 days of target treatment date). After obtaining consent, individuals who were admitted to the hospital during the study period and met the stipulated inclusion criteria were evaluated for eligibility. Clinically significant information was recorded regarding the mother's age, any notable maternal disorders, gravida, blood pressure monitoring, haemoglobin estimation, urine protein testing, random or fasting blood sugar estimation in the appropriate patients, the baby's weight and sex, whether the baby was born alive or still, etc. Unbooked prenatal cases with gestational ages less than 28 full weeks were omitted, and women who gave birth in a hospital without any examination or paperwork were included. Using SPSS version 16, data analysis was done after acquiring all the necessary information. p-value under 0.05 were considered significant.

## RESULTS

A total of 380 patients were studied in this study and among which, 190 patients were booked and 190 were unbooked. The age of the studied patients either booked or unbooked was in between 20-40 years. There were different causes of obstructed labour such as CPD (60.62%), malpresentation (17.98%), and malposition (23.34%) in patients.

Variables	Booking status				Total	p-value
	Booked (n)	%	Unbooked (n)	%		
<b>Age (years)</b>						
> 20	21	11.05	15	7.89	36	< 0.006
21-25	52	27.36	26	13.68	78	
26-30	31	16.31	62	32.63	93	
31-35	60	31.57	37	19.47	97	
> 40	26	13.68	50	26.31	76	
Total	190	100	190	100	380	
<b>Educational level</b>						
Illiterate	9	4.73	34	17.9	63	< 0.01
Primary	14	7.3	57	30	71	
Middle	28	9.47	60	31.57	88	
Matric	35	18.42	16	8.42	51	
FSC	43	22.63	13	6.84	56	
University	61	32.1	10	5.26	71	
Total	190	100	190	100	380	
<b>Social class</b>						
Upper class	88	46.31	24	12.63	112	< 0.01
Middle class	62	32.63	63	33.15	125	
Lower class	40	21.05	103	54.21	143	
Total	190	100	190	100	380	
<b>Parity</b>						
0	25	13.15	22	11.57	47	< 0.02
1-2	90	47.36	93	48.94	183	
3-4	44	23.15	42	22.1	86	
> 5	31	16.31	33	17.36	64	
Total	190	100%	190	100%	380	

**Table 1:** Sociodemographic characters of booked and unbooked patients

In booked patients, 9.47, 3.15, and 5.78% of wound infection, anaemia, and ruptured uterus were recorded, respectively, while 11.05, 4.73, and 6.84%, respectively in unbooked patients (Table 2). It was recorded that among booked patients, 80.52% had maternal complications while 95.26% of unbooked had complications.

Maternal complications	Booking status of patients			
	Booked (n)	%	Unbooked (n)	%
PPH	10	5.26	14	7.36
UTI	4	2.10	9	4.73
Maternal mortality	12	6.31	19	10
Puerperal pyrexia	20	10.52	23	12.10
Ruptured uterus	11	5.78	13	6.84
Wound infection	18	9.47	21	11.05
Anaemia	6	3.15	9	4.73
PIH	0	0.00	1	0.52
Total patients	81	80.52%	109	95.26%

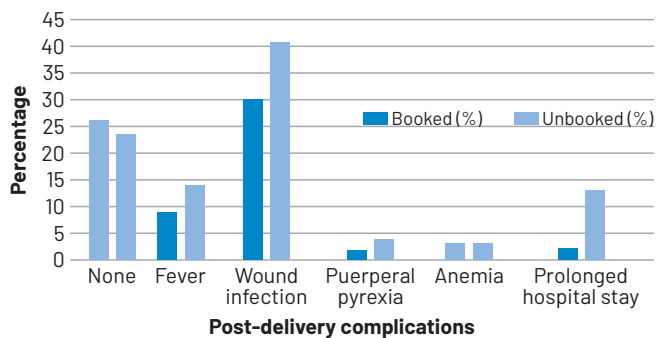
**Table 2:** Maternal complications in booked and unbooked patients

Table 2 shows the maternal complications in booked and unbooked patients. It was noted that unbooked patients had a statistically significant higher incidence of maternal complications than booked patients. The incidence of antepartum haemorrhage (PPH) and UTI in unbooked patients was 7.36 and 4.73%, respectively, while 5.26 and

2.10%, respectively in unbooked patients. 4.73% convulsions were observed in booked patients and 8.42% in unbooked patients while 7.36 and 11.57% neonatal sepsis was recorded in booked and unbooked patients, respectively (Table 3).

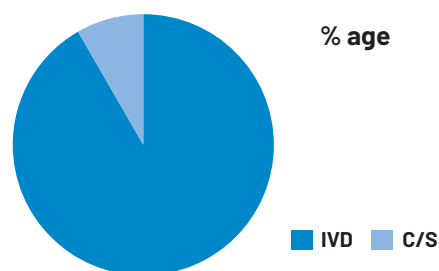
Fetal complications	Booking status of patients			
	Booked (n)	%	Unbooked (n)	%
Convulsions	9	4.73	16	8.42
Neonatal jaundice	12	6.31	17	8.94
Birth asphyxia	13	6.84	23	12.1
Perinatal mortality	15	7.89	23	12.10
MAS	11	5.78	14	7.36
Neonatal sepsis	14	7.36	22	11.57
Total patients	75	39.47%	115	60.52%

**Table 3:** Fetal complications in booked and unbooked patients



**Figure 1:** Post-delivery complications in patients

After giving birth to the child, booked and unbooked patients faced various complications. The major complications were fever, wound infection, anaemia, puerperal pyrexia etc. as shown in figure 1. It was recorded that the mode of delivery in the majority of patients was IVD as shown in figure 2.



**Figure 2:** Mode of delivery in patients

## DISCUSSION

It is estimated that obstructed labor occurs in 5% of pregnancies and is responsible for 2.8% of maternal deaths worldwide. In the developing world, 99% of these deaths occur. It is estimated that 10.3 to 38.9% of maternal deaths in Africa are caused by obstructed labor. Most of the cases were primiparas. The results of this study were in agreement with those from Hawassa, Pakistan, Bangladesh, and Uganda, where most of the cases were

primiparas. In most cases, mothers with obstructed labor had experienced antepartum hemorrhage, premature rupture of membranes (PROM), and hypertension and twin pregnancy. There have been many studies in west Uganda and Hawassa where about 4.4% and 2.8% of study participants had twins and PROM, respectively [17, 7]. The research was performed by Isalm et al 2012 and Sodje et al 2016, and they resulted in 18 and 82% unbooked and booked, respectively [18,19]. Owolabi et al 2008 had reported 5.96% PPH incidence in unbooked patients which are in line with our study findings [14]. Many other researchers had reported similar results [17, 20]. In the current study, it was seen that unbooked patients face more difficulty or complications before and after delivery. This may be due to a lack of facilities and improper visiting hospitals or clinics than booked patients. Previous many studies had concluded similar results [12, 21-23]. The quality of life is impacted by maternal and foetal morbidity, and the impact is dependent on effective antenatal monitoring. The risk of post-partum haemorrhage and other problems following surgery was considerably higher in the unbooked group. Unbooked cases had higher perinatal mortality. Low birth weight and NICU admission required; increased perinatal morbidity in the unbooked group. NICU transfers affected more infants in the unbooked group than the booked group, and the difference was large (9.8% versus 1.9%). Preterm birth, anaemia, preeclampsia/eclampsia, complicated labour, and puerperal sepsis were less common in the scheduled group, while spontaneous vaginal birth was more common (81.3% vs 59.8%) in booked cases. The current study findings are almost similar to the previous researchers in the globe [24, 25].

## CONCLUSIONS

The goal of the current observational study was to evaluate fetomaternal problems. Primigravida substantially outnumbered multigravida among booked patients compared to unbooked patients. The bulk of the patients in our study was unscheduled and came from remote places without access to medical facilities. CPD was the most frequent factor in labor obstruction, followed by malposition and mal-presentation. Puerperal pyrexia was the most frequent maternal complication, followed by wound infection, UTI, and PPH. Birth asphyxia was the most frequent prenatal consequence, followed by newborn sepsis, jaundice, and MAS.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the

research, authorship and/or publication of this article

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## Original Article

## Frequency of Bleeding Duodenal Ulcer in Patients presenting with Upper Gastrointestinal Bleeding

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## ARTICLE INFO

## Key Words:

Gastrointestinal surgery, Peptic ulcer bleeding, Endoscopy and Mortality

## How to Cite:

Fahim, M. ., Sohail, M. ., Sajjad Khan, M., Khan, F. U. ., Ur Rashid, S. ., & Akhter, S. . (2022). Frequency of Bleeding Duodenal Ulcer in Patients Presenting with Upper Gastrointestinal Bleeding: Frequency of Duodenal Ulcer in patients with Gastrointestinal Bleeding. *Pakistan Journal of Health Sciences*, 3(06). <https://doi.org/10.54393/pjhs.v3i06.308>

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Received Date: 31th October, 2022

Acceptance Date: 15<sup>th</sup> November, 2022

Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

Acute upper gastrointestinal bleeding is a well-known complication of peptic ulcers and erosions. The prevalence of Upper Gastrointestinal bleeding ranges from 48-160 patients per 100,000 people, with consistent reports of higher incidence among elderly and men. **Objective:** To determine the incidence of duodenal ulcer bleeding in patients admitted to the tertiary care hospital with bleeding from the upper gastrointestinal tract. **Methods:** The study included 270 patients, 20 to 70 years of age, of both sexes with upper gastrointestinal bleeding within 24 hours of symptom onset. A detailed interview and complete physical examination were performed. Endoscopic examination protocols were followed and accomplished within 48-hrs of the start of symptoms as bleeding. All of the above information, including age, sex and duodenal ulcer, was documented in a formerly designed proforma. The data were analyzed and entered in SPSS 22.0. **Results:** The mean age and SD were 54.5 + 10.54. 110 (40.74%) patients were 20-45 years old and 160 (59.25%) subjects were 46-70 years old. 190 (70.37%) patients were male and 80 (29.62%) females. While in this study duodenal ulcer was seen in 64 (23.70%) patients, 206 (76.29%) patients did not have duodenal ulcer. **Conclusions:** Upper Gastrointestinal bleeding is secondary to duodenal ulcers due to an increase in early readmissions over time, as observed in this local population, resulting in a higher incidence of duodenal ulcers in our local population.

## INTRODUCTION

Bleeding from the upper gastrointestinal tract is a communal symptom in medical institutions and gastroenterology clinics [1]. It has multiple causes that varies greatly in different geographic regions of the world [2]. Despite developments in treatment, upper gastrointestinal bleeding secondary to peptic ulcer remains a serious medical risk with significant mortality, morbidity and healthcare costs. The peptic ulcer disease is assumed to be reduced due to improvements in endoscopic techniques, decreased *Helicobacter pylori*

incidence and an increased use of acid-inhibiting drugs. However, advances in peptic ulcer treatment have not necessarily reduced the number of hospitalizations for upper gastrointestinal bleeding following peptic ulcer disease or the risk of adverse events, counting mortality. Conflicts in previous studies results can be clarified by various factors. Gastric ulcer epidemiology has evolved and is no longer driven by *H. pylori*. An aging population has increased use of non-steroidal anti-inflammatory drugs (NSAIDs), counting aspirin. This results in more frequent

bleeding from the upper gastrointestinal tract following peptic ulcer disease in the elderly people. The utmost communal symptoms are bloody vomiting in acute bleeding and melaena in cases which were chronic. It has been observed that duodenal ulcer is common in cirrhosis patients than in the over-all population [3]. In previous years, most bleeding in patients with cirrhosis was attributed to esophageal varices [4]. The widespread use of upper gastrointestinal endoscopy has shown that in many cases it can cause erosions, gastritis, or other injuries such as peptic ulcers, especially duodenal ulcers [5]. The prevalence of upper gastrointestinal bleeding ranges from 48-160 patients per 100,000 people, with consistent reports of higher incidence among elderly and men [6]. The acute upper gastrointestinal bleeding most communal reason is not varicose veins, and bleeding from peptic ulcer (PIU) accounts for 28% to 59% of cases [7]. Most peptic ulcer disease patients are successfully treated by H. pylori infection treatment and / or using suitable antisecretory therapy and avoiding NSAIDs usage [8]. In USA, triple therapy based on proton pump inhibitors (PPIs) is the recommended primary treatment for H. pylori infection. Peptic ulcers are defects in the lining of the duodenum or stomach that cover along the mucosal membrane [9]. The gastric and duodenal epithelial cells secrete mucus as a consequence of the cholinergic stimulation and epithelial lining irritation. The superficial part of the duodenal and gastric mucosa is in the gel layer form that is not-permeable to pepsin and acids. Other cells in the stomach and duodenum secrete bicarbonate, which helps buffer the acid near the mucosa [10]. Type E prostaglandins (PGEs) play a vital protective part as PGEs increase the secretion of both mucosal layer and bicarbonate [11]. The aim of the study was to govern the incidence of duodenal ulcer bleeding in patients admitted to the tertiary care hospital with bleeding from the upper gastrointestinal tract in order to determine the morbidity and mortality associated with duodenal ulcer in our local population. No comparable analysis has been performed at our facility in the previous 5-years, this analysis will provide the most up-to-date and latest information on the frequency of duodenal ulcer bleeding in upper GI bleeding patients. This study outcomes will be beneficial for other healthcare professionals and can be the reference for further studies.

## METHODS

270 total patients of both sexes, 20 to 70 years of age, selected by sequential sampling of improbable samples with bleeding from the upper gastrointestinal tract within 24 hours of symptom onset, were registered in the study. A comprehensive interview and complete physical

assessment were performed. Inclusion Criteria: All patients reporting upper gastrointestinal bleeding reporting within 24 hours of symptom onset, Patients aged 20-70, Patients of both sexes. Exclusion criteria: Patients with severe shock (BP 90/160), patients with coagulation disorders, recent myocardial infarction, severe respiratory disease, arrhythmias or unstable angina were omitted from the study. Hospital ethics committee approval and approval from CPSP REU department were obtained. A detailed interview and complete physical examination were performed. Endoscopic examination protocols were followed. Compulsory baseline tests, including complete blood count, were obtained; occult blood faeces, eggs / cysts; bleeding profile; hepatitis serology; ECG, abdominal ultrasound, X-ray chest at admission before the procedure. Patients were registered for endoscopic evaluation of the upper gastrointestinal tract after obtaining informed consent. Upper gastrointestinal endoscopy was accomplished within 48-hrs of the start of symptoms as bleeding. Local anesthesia of the throat was provided with a 4% xylocaine spray. The entire procedure was performed under the supervision of a gastroenterologist with at least five years of experience. All of the above information, including age, sex and duodenal ulcer, was documented in a formerly designed proforma. The data were analyzed and entered in SPSS 22.0. Means and S.D were calculated for quantitative variables such as size of the lesion and age. The frequency and percentages were calculated by gender and bleeding duodenal ulcer. Duodenal ulcer was graded with gender and age to determine the effect modification. The chi-square test was used after stratification, considering the P value <0.05 as significant. All results are presented in graphs and tables.

## RESULTS

The study was conducted on 270 patients at the Department of Gastroenterology at MTI-Lady Reading Hospital in Peshawar. The results are given below: - Mean and SD for age were  $54.5 \pm 10.54$ . 110 (40.74%) patients were 20-45 years old and 160 (59.25%) patients were 46-70 years old. 190 (70.37%) patients were male and 80 (29.62%) females. (Table 1).

Age Group	Frequency (%)
20-45 Years	110 (40.74%)
46-70 Years	160 (59.26%)
Total	270 (100%)
Gender	
Male	190 (70.37%)
Female	80 (29.62%)
Total	270 (100%)
Mean age	$54.5 \pm 10.54$ SDs

**Table 1:** Shows the patients demographic features (n=270)

While in this study duodenal ulcer was registered in 64 (23.70%) patients, 206 (76.29%) patients did not have duodenal ulcer. (Table 2).

Duodenal Ulcer	Frequency (%)
Yes	64 (23.70%)
No	206 (76.29%)
Total	270 (100%)

**Table 2:** Frequency and Percentages for Duodenal Ulcer (n=270)

Age and Gender was controlled through stratification and therefore can be seen at Table 3 and 4 respectively. Table 3 shows the incidence of duodenal ulcer with respect to the age; 14(5.18%) subjects out of 110 were found positive for duodenal ulcer in 20-45 years of age while 50(18.51%) patients out of 160 have duodenal ulcer in 20-45 years of age patients.

Age	Duodenal Ulcer	Frequency (%)	P Value
20-45 Years	Yes	14 (05.18%)	0.0004
	No	96 (35.55%)	
46-75 Years	Yes	50 (18.51%)	
	No	110 (40.74%)	

**Table 3:** Stratification of Duodenal Ulcer with Age (N=270)

Table 4 shows the incidence of duodenal ulcer with respect to the gender; 39(14.4%) male subjects out of 190 were found positive for duodenal ulcer while 25(9.25%) female patients out of 80 have duodenal ulcer.

Gender	Duodenal Ulcer	Frequency (%)	P Value
Male	Yes	39 (14.44%)	0.058
	No	151 (55.92%)	
Female	Yes	25 (09.25%)	
	No	55 (12.96%)	

**Table 4:** Stratification of Duodenal Ulcer with Gender (N=270)

## DISCUSSION

Bleeding from the upper gastrointestinal tract is a communal symptom in medical institutions and gastroenterology clinics. It has multiple causes that varies greatly in different geographic regions of the world. The utmost communal symptoms are bloody vomiting in acute bleeding and melaena in cases which were chronic. In this study, the mean age and SD were 54.5 + 10.54. 110 (40.74%) patients were 20-45 years old and 160 (59.25%) patients were 46-70 years old. 190 (70.37%) patients were male and 80 (29.62%) females. While in this study duodenal ulcer was registered in 64 (23.70%) patients, 206 (76.29%) patients did not have duodenal ulcer. In total, 20,006 upper GI endoscopies were accomplished in one study [12, 13]. Duodenal ulcer was diagnosed in 696 (3.5%) cases and bleeding symptoms were observed in 158 (22.7%) cases, mean and SD for age was 54.5 + 10.54 compared to this study. 110 (40.74%) patients were 20-45 years old and 160 (59.25%) patients were 46-70 years old. 190 (70.37%) patients were male and 80 (29.62%) females. While in this

study duodenal ulcer was seen in 64 (23.70%) patients, 206 (76.29%) patients did not have duodenal ulcer. Of these ulcers, 45 (6.5%) were graded as Forrest I and Forrest II was seen in 113 (16.2%) cases. Gastric ulcer was identified in 488 cases (2.5%), and symptoms of bleeding were observed in 61 cases (12.3%) in Fallah et al., study [14]. Compared to this study, where the mean age and SD was 54.5 ± 10.54, 19 patients (3.9%) have Forrest 1 grading and 41 patients (8.4%) had Forrest 2. The gastric ulcers incidence remained stable over time, while the duodenal ulcers incidence decreased [15, 16]. It has been observed that duodenal ulcer is common in cirrhosis patients than in the over-all population. In previous years, most bleeding in patients with cirrhosis was attributed to esophageal varices. The widespread use of upper gastrointestinal endoscopy has shown that in many cases it can cause erosions, gastritis, or other injuries such as peptic ulcers, especially duodenal ulcers. The prevalence of upper gastrointestinal bleeding ranges from 48-160 patients per 100,000 people, with consistent reports of higher incidence among elderly and men. The acute upper gastrointestinal bleeding most communal reason is not varicose veins, and bleeding from peptic ulcer accounts for 28% to 59% of cases. Most peptic ulcer disease patients are successfully treated by H. pylori infection treatment and / or using suitable antisecretory therapy and avoiding NSAIDs usage. In USA, triple therapy based on proton pump inhibitors (PPIs) is the recommended primary treatment for H. pylori infection [17, 18]. In this study, patients with bleeding duodenal ulcers had a worse prognosis than patients with bleeding gastric ulcers. Duodenal ulcers were associated with increased mortality, surgery, and admission rates [19, 20]. Bleeding from duodenal ulcers has been related with an augmented risk of mortality and surgery in some, but not all as shown in previous studies [21, 22]. Duodenal ulcers may be associated with a poorer prognosis as duodenal ulcers may be technically more difficult to manage; especially in the case of endoscopy performed in rural areas with little experience in the treatment of upper gastrointestinal bleeding secondary to peptic ulcer disease [6, 23].

## CONCLUSIONS

Upper gastrointestinal bleeding is secondary to duodenal ulcers due to an increase in early readmissions over time, as observed in this local population, resulting in a higher incidence of duodenal ulcers in our local population. The limitation of this study was the six-month period, which was too short to meaningfully assess the time trends in our local population.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Frequency of Incomplete ST Segment Resolution After Successful Primary Percutaneous Coronary Intervention

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## ARTICLE INFO

**Key Words:**

Primary Percutaneous Coronary Artery Intervention (PPCI), Acute ST segment Elevation Myocardial Infarction (STEMI), ST Segment Resolution (STR)

**How to Cite:**

Jamil, A. ., Shaikh, L. ., Ahmed, B. ., Manzoor, V. ., Hussain, S. ., Hussain, W. ., & Saghir, T. . (2022). Frequency of Incomplete St Segment Resolution After Successful Primary Percutaneous Coronary Intervention: Incomplete ST Segment Resolution After Successful Primary Percutaneous Coronary Intervention. *Pakistan Journal of Health Sciences*, 3(06). <https://doi.org/10.54393/pjhs.v3i06.210>

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Received Date: 6<sup>th</sup> October, 2022

Acceptance Date: 14<sup>th</sup> October, 2022

Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

The success of primary Percutaneous Coronary Intervention (PCI) can be verified on electrocardiogram through measuring ST Resolution (STR) and examination of their angiogram.

**Objective:** The purpose of this research was to identify instances of after the primary PCI of partial STR and to investigate the characteristics associated with incomplete STR following primary PCI. **Methods:** At department of Interventional Cardiology of National Institute of Cardiovascular Disease (NICVD), Karachi, Pakistan, this Descriptive Cross-sectional study was conducted. The inclusion criteria set for data collection were patients with age between 18 to 65 years of both genders presented with complain of chest pain 12 hour previously and now diagnosed with acute STEMI, and undergoing successful primary PCI were included in the study.

**Results:** Out of 196 patients, male was 74.5% while female were 25.5%. The Mean age of patients was 52.78±7.81 years. Out of 196 patients, with acute STEMI, 35.2% (69) had Incomplete STR after a successful primary PCI. When applying chi square on study variables with Incomplete STR after a successful primary PCI was found to be not associated with patient's baseline characteristics. **Conclusions:** Our research discovered that a considerable proportion of patients with STEMI have Incomplete STR after first PCI. However, no correlation between STR and baseline patient characteristics was observed.

## INTRODUCTION

Highest affecting rate in both developed and developing countries worldwide of Coronary artery disease (CAD) [1]. Among all the types of CAD, STEMI is regarded as the most dangerous and life threaten factor [2]. In cluster of available treatments, PPCI is the first choice for patients with STEMI [3]. However, the success of PCI can be verified on electrocardiogram through measuring ST Resolution (STR) and examination of their angiogram. Currently, the elevation of ST-segment in the ECG is known to be the classical hallmark, also considered necessary criteria to identify the patients with chest pain who in dire need coronary vascularization [4]. The initial ECG suited for

assessing STR after primary PCI is generally performed on the coronary care unit (CCU) as shown in figure 1. It may take anything from 30 minutes after PCI to another 30 minutes or perhaps many hours after being admitted to the CCU [5]. According to the research, various measures of myocardial perfusion other than STR perform less good than STR after 30 minutes after PCI [6]. In STR, the good blood supply to the epicardium does not always mean sufficient blood flow to the myocardium [7]. Therefore, monitoring of STR after successful direct PCI may be the most appropriate way to confirm coronary arteries supplying blood properly [8]. Despite the success of initial PCI, most patients still show

poor symptoms of myocardial perfusion, manifested by a continuous ST segment increase and incomplete removal of STR Elevation. After PCI, the presence or absence of STRs is an important indication of left ventricular dysfunction and poor clinical outcome [9]. Monitoring STR after successful primary PCI for optimal perfusion in the cardiac micro vessels is the most convenient way [10]. Recent studies have shown that STR is a useful prognostic factor for late revascularization and myocardial infarction recurrence rate, but it does not predict long-term mortality in STEMI patients following PPCI [11]. In several studies, complete STR is defined as ST-segment decline of more than 70% of pre-PCI ST-segment elevation. The angiographic surrogate for myocardial perfusion are two commonly accessible procedures, namely recovery of electrocardiographic STR and restoration of normal myocardial blush (MB) [12]. According to current understanding, resolution or recovery of the ST-segment after reperfusion treatment indicates successful microvascular perfusion of cardiac tissue salvaging myocardium [13]. Numerous thrombolytic investigations have provided the most conclusive evidence for STR's predictive usefulness. [14]. However, significant variations in the degree of epicardial blood flow restoration were detected between PPCI and thrombolysis: 60% with thrombolysis versus close to 95% with PPCI, as well as the rate of blood flow restoration [15]. The purpose of this research was to identify instances of incomplete STR after primary PCI and to investigate the characteristics associated with incomplete STR during primary PCI.

## METHOD

Study was conducted at Department of Interventional Cardiology at National Institute of Cardiovascular Disease (NICVD), Karachi, Pakistan as descriptive cross-sectional. WHO sample size calculator version 2.0 were used and total 196 patients were included to determine the frequency of incomplete ST-segment elevation resolution 95% confidence interval, 7% of margin of error and 49.4% of expected prevalence were targeted. P value 0.005 were considered significant. Non-probability, and consecutive sampling technique were used for data collection. The inclusion criteria set for data collection were patients with age between 18 to 65 years of both genders presented with complain of chest pain 12 hour previously and now diagnosed with acute STEMI, and undergoing successful primary PCI were included in the study. Whereas patients who had previous history of any cardiac related surgery were excluded from the study. Prior to sampling or data collection, the study was approved by the ethical review committee of NICVD, Karachi, Pakistan. Research questionnaire was pre-designed in which the demographic

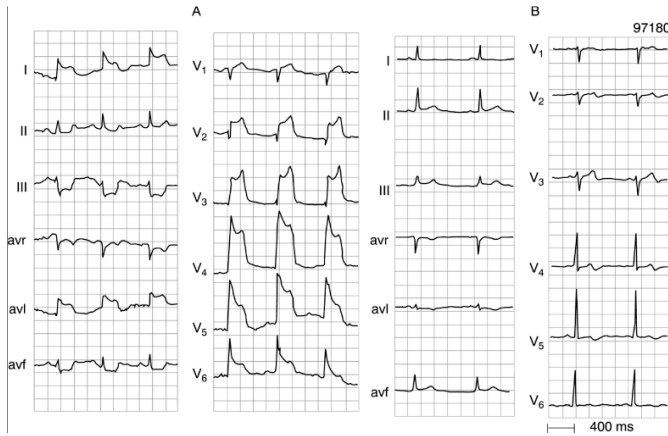
profile of the patients such as age, gender, smoking status, hypertension, family history and diabetes mellitus of CAD were retrieved. A verbal informed permission was obtained from each participant before the study's participation by outlining its goals, methods, dangers, and benefits. All PCI operations were documented by a consultant cardiologist with more than 5 years of experience. Patients were pre-treated with aspirin and a second oral antiplatelet drug, such as clopidogrel or ticagrelor, while post PCI angiography and ECG (before the operation & after 30 minutes of procedure) were conducted by competent cardiologists and personnel. STEMI was classified as per the defined operational definition. Incomplete STR was recorded for the selected patients. Strictly following inclusion and exclusion criteria was controlled for confounding variables and biases. The collected data was analysed in SPSS version-21. P-values of less than five percent were considered statistically significant. Pie-charts were employed for the visual representation of data.

## RESULTS

We recruited a total of 196 patients of either gender i.e., male or female with the age of 18 years to 65 years. Out of 196 patients, 74.5% were male and 25.5% were female. The Mean age of patients was 52.78±7.81 years. The Descriptive statistics of age and further stratified in groups into frequency and Percentages presented in Table 1. Among all study subjects, 27.6% with diabetes mellitus, 51.5% with hypertension, 29.1% were smokers, and 9.2% had family history of CAD. The data revealed that people with hypertensive were more prone to CAD. Out of 196 patients, with acute STEMI, 35.2% (69) had Incomplete STR after a successful PCI. Incomplete STR after a successful PCI was found to be not associated with patient's baseline characteristics and family history of CAD. Among total study subjects, 27.6% with diabetes mellitus, 51.5% with hypertension, 29.1% were smokers, and 9.2% had family history of CAD. The STR by Different Patient Characteristics is presented in Table 1.

S. No.	CHARACTERISTICS	PRESENT (Frequency %)	ABSENT (Frequency %)
1.	Age	45.09 ± 3.5	47.03 ± 3.7
2.	Diabetes Mellitus	142 (72.4%)	54 (27.6%)
3.	Hypertension	95 (48.5%)	101 (51.5%)
4.	Smoking	139 (70.9%)	57 (29.01%)
5.	Family History of CAD	178 (90.8%)	18 (9.2%)

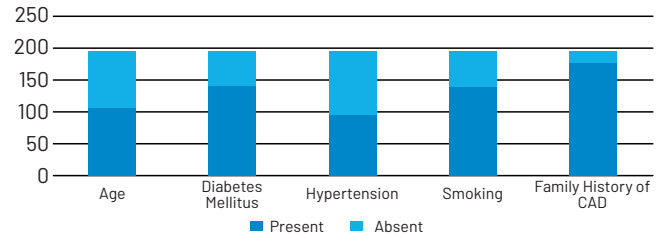
**Table 1:** Descriptive statistics of 196 study patients of STR The initial ECG suited for assessing STR after primary PCI is generally performed on the coronary care unit (CCU) as shown in figure 1.



**Figure 1:** ECG showing ST elevations in leads V1, V2, V3, V4, V5, V6 and I, aVL before PPCI(A) and ST segment resolution after PPCI(B) When applying chi square on study variables with Incomplete STR after a successful primary PCI was found to be not associated with patient's baseline characteristics and family history of CAD. The STR by Different Patient Characteristics along with their p values are presented in Table 2. Although the very low incidence rate of incomplete STR among male, Age 18 to 50%, nondiabetic, non-hypertensive, non-smoker and with no family history of CAD were predicted as shown in table 2. It can be resulted that study variables do not influence in incomplete STR.

Variables	Incomplete ST-Segment Resolution		p-value
	Present n (%)	Absent n (%)	
<b>Gender</b>			
Male	49 (33.60%)	97 (66.4%)	0.411**
Female	20 (40%)	30 (60%)	
<b>Age Group</b>			
18 to 50 years	30 (34.1%)	58 (65.9%)	0.768**
51 to 65 years	39 (36.1%)	69 (63.9%)	
<b>Diabetes Mellitus</b>			
Yes	22 (40.7%)	32 (59.3%)	0.317**
No	47 (33.1%)	95 (66.9%)	
<b>Hypertension</b>			
Yes	38 (37.6%)	63 (62.4%)	0.465**
No	31 (32.6%)	64 (67.4%)	
<b>Smoking</b>			
Yes	24 (42.1%)	33 (57.9%)	0.195**
No	45 (32.4%)	94 (67.6%)	
<b>Family History of CAD</b>			
Yes	6 (33.3%)	12 (66.7%)	0.862**
No	63 (35.4%)	115 (64.6%)	
Chi Square Test was applied.			
P-value ≤ 0.05 considered as significant.			
**Not significant at 0.05 level.			

**Table 2:** Statistical Stratification among study variables and study outcome of 196 patients



**Figure 2:** The demographic information about the 196 patients. The frequency and the distribution of 196 patients on the basis of Gender, Age, Diabetes Mellitus, Hypertension, Smoking and CAD.

## DISCUSSION

The baseline characteristics of the patients were statistically analysed and the results showed that STR is not associated with initial characteristics of the patients, age, gender, diabetic mellitus, family history and hypertension. For a long time, the use of STR as a diagnostic tool in STEMI has been established in an age of thrombolytic therapy [16]. The role of STR in the current PCI era is not well understood due to the limitations of previous PCI studies, including the use of irregular stents, lack of information on drug-filled stents, lack of standardization of ECG time after reperfusion, and relatively short follow-up time [3]. STR has been proved to be a stronger predictive predictor than epicardial blood flow recovery, as seen in our findings. As a result, STR may be a useful early-stage marker for predicting the outcome of AMI patients. The majority of trials assessed STR effect on clinical, angiographic, and outcome measures 30–120 minutes after PCI [8–9]. In 2009 Park S, et al., conducted study on “clinical predictors of incomplete STR in the patients with acute ST segment elevation myocardial infarction”. Beside other study variables age, gender, hypertension, diabetes mellitus, and tobacco smoker were similar with our study. Age, gender, diabetes mellitus, tobacco smoker has no significant difference in partial, complete and incomplete STR. However, hypertension reflect higher significance with p value of <0.004 in incomplete STR group which contrast the statement of our study [17]. Similarly, another study was conducted in 587 patients to determine the magnitude of STR with an Acute Myocardial Infarction (AMI) after thrombolytic therapy (streptokinase) resulted in successful STR in short- and long-term outcomes [18]. It has been said that more than 90 mins of ST segment analysis is associated with reperfusion which leads to induced cell death. However, for that cause, we evaluated STR for 30 min after PCI. Another hypothesis contends that TIMI blush grading may be used to assess myocardial perfusion following PPCI. Longer angiographic recordings need to be made in order for blush grade analysis to be possible. Since our goal was to investigate ST-segment resolution and there was no specific procedure for

angiographic examination, we examined TIMI flow in sub epicardial arteries [19]. In our study we divided age into two group i.e. 18 to 50 years and 51 to 65 years and found out age has not effect in incomplete STR. Similar result was declared by Prasad A, et al, they divided the Age in 4 categories which evaluated in respect of mortality as well. As per their study findings age of patient significantly effect in partial and complete STR but in incomplete STR no association was predicted (p value 0.33) [20]. In Iraq, the most recent study was conducted for evaluating the factors that are associated with incomplete ST segment elevation. The association of above-mentioned factors in the population of Iraq shows that geographically the diseases vary and the may be genetic and environmental factors are also causing the variation in the symptoms and factors [21].

## CONCLUSIONS

Our study showed a significant number of patients presented with STEMI had Incomplete STR after primary PCI. However, no association was found between STR and patient's baseline characteristics. It is important to identify factors affecting STR to improve the outcomes of STEMI.

## Conflicts of Interest

The authors declare no conflict of interest.

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Frequency of Triple Vessel Coronary Artery Disease in Diabetic and Non-Diabetic Patients presenting with NSTEMI

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## ARTICLE INFO

## Key Words:

Non-ST Elevation Myocardial Infarction (NSTEMI), Three Vessel Disease (3VD), Multivessel Disease (MVD), Multivessel Coronary Disease (MVCD), Coronary Artery Bypass Grafting (CABG)

## How to Cite:

Ahmed, B. ., Manzoor, V. ., Hussain, S. ., Hussain, W. ., Jamil, A. ., Shaikh, L. ., & Saghir, T. . (2022). Frequency of Triple Vessel Coronary Artery Disease in Diabetic and Non Diabetic Patients Presenting with NSTEMI: Frequency of Triple Vessel Coronary Artery Disease in Diabetic and Non-Diabetic Patients. *Pakistan Journal of Health Sciences*, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.221>

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Received Date: 9th October, 2022

Acceptance Date: 15th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

Multi-vessel coronary artery disease (MVD) has profound challenges to the revascularization system. Several investigations showed diverse forms of CAD associated with complete or incomplete revascularization in MVD in PCI. Diabetic patient had more multi-vessel CAD as compared to non-diabetics. **Objectives:** To determine the frequency of triple vessel coronary artery disease and afterwards compare the triple vessel coronary artery disease in diabetic v/s non-diabetics in patients presenting with NSTEMI. **Methods:** This Descriptive Cross-Sectional Study was conducted at Emergency Department of the National Institute of Cardiovascular Diseases (NICVD), Karachi for Six months from March 4, 2019, to September 3, 2019. Samples size n=250 was calculated through non-probability consecutive sampling technique. All the patients of either gender presenting NSTEMI and undergone coronary angiography, aged >40 and < 75 years and agreed to participate after their volunteer affirmation were included in this study. **Results:** Out of 250 patients, 75.6% were male while 24.4% were female with a mean age of 56.60. Triple Vessel Disease was documented in 107(42.8%) patients. As for the study main objective variable diabetes, the comparative analysis of triple vessel disease between diabetic versus non-diabetic resulted in significant difference was noted i.e., p-value =0.030. **Conclusions:** Diabetic Mellitus has a significant factor for 3VD among the patients of NSTEMI patients. As a risk factor and comorbid, DM screening is a necessary factor in all NSTEMI patients who diagnosed with 3VD.

## INTRODUCTION

Cardiovascular diseases (CVD) account for 17.9 million deaths each year globally out of which 7.2M deaths were due to CAD [1]. It has been evaluated that presence of 3VD among ACS patients is the most lethal and severe form of coronary artery disease. Moreover, the Highest susceptibility of CAD was observed in ethnicity of Indo-Asian origin and is therefore unexpectedly high mortality in the Indo-Pak subcontinent [2]. Multi-vessel coronary artery disease (MVD) has profound challenges to the revascularization system. Several investigations showed

diverse forms of CAD associated with complete or incomplete revascularization in MVD in PCI. 3VCAD is said to be strongly associated form of atherosclerosis and is practically handled by CABG, due to its worst life long-term prognosis [3]. According to the report, 3VCAD presented in 8.7% of cases with NSTMI. Mohr et al., carried out a cross-sectional study that revealed MVCAD is the reason for NSTEMI [4]. In 2018 a cross-sectional study was done with a sample size of 123 patients presented with complaints of NSTEMI. Their results showed raised troponin I levels, more

than ten times which was the most extreme limit of the typical reach in NSTEMI patients, and it was firmly connected with more unpredictable and severe CAD [5]. In 2016, a cross-sectional study was conducted to find out the frequency of 3VD in patients with NSTEMI. They assumed that the patients with NSTEMI were probably going to have 3VD [6]. A retrospective study in the same year 2016 was carried out to find association between coronary risk factor profile and angiographic features between young STEMI and NSTEMI patients. Their results showed 3VD was significantly more common in the NSTEMI group [7]. Heitner et al., in 2019 had realized that the infarct-related artery (IRA) by coronary angiography can be demanding in patients with NSTEMI. Their analysis has shown that Delayed-Enhancement Cardiac Magnetic Resonance DE-CMR might prompt another IRA analysis or explain non-ischemic pathogenesis [8]. Among the risk factor of CAD, DM plays a major role in cardiovascular diseases and hence cardio-diabetology is the fast aroused subspecialty of CVDs around the world. According to WHO diabetes will be ranked 4th in Pakistan by the year 2025 which was further proofed by a study that reported 3VD 32.78% v/s 27.15% in diabetes v/s non-diabetic NSTEMI patients. In addition to that diabetic patient had more multi-vessel CAD as compared to non-diabetics. The global and regional Mortality projections and disease burden, in the next 20 years CAD will remain the leading cause of death [9]. With this approach, this study aims to determine the frequency of triple vessel coronary artery disease and afterward compare the 3VD in diabetic v/s non-diabetics in patients presenting with NSTEMI.

## METHODS

The descriptive cross-sectional study was conducted at the Emergency Department of the National Institute of Cardiovascular Diseases (NICVD), Karachi for Six months from March 4, 2019, to September 3, 2019. Samples size  $n=250$  was calculated through non-probability consecutive sampling technique and by using W.H.O sample size calculator version 2.0, with a confidence interval at 95%, the margin of error (d) 3.5% and  $P=8.7\%$  expected prevalence of TVCAD. All the patients of either gender presenting NSTEMI and undergone coronary angiography, aged  $>40$  and  $<75$  years and agreed to participate after their volunteer affirmation were included in this study. Patients diagnosed with chronic kidney diseases who are on dialysis ( $GFR < 15 \text{ ml/min/1.73m}^2$ ), anemia ( $Hb < 7 \text{ g/dl}$ ), ejection fraction less than 20% (low predictor of mortality rate), previous history of coronary artery bypass graft, prior history of any cardiac-related surgery, and History of circulatory collapse requiring cardiopulmonary resuscitation or any major complication during angioplasty

like cardiogenic shock, renal failure or unconsciousness, (confirmed through patient history) and situs inversus were excluded from this study. The study was approved by the ethical committee of the College of Physicians & Surgeons, and the National Institute of Cardiovascular Diseases (NICVD), Pakistan (Ref. No: CPSP/REU/CRD-2016-195-1364). Written informed consent was taken from the patient who fulfilled the inclusion criteria were enrolled in this study. In Performa, baseline demographic data including name, age, gender, and admission date were recorded. All patients undergo coronary angiography procedure, having NSTEMI with occluded arteries leads to AVR and 3VCAD, under the supervision of experienced consultant cardiologists practicing for  $>5$  years. All data regarding complete clinical investigations were recorded by the principal investigator on a precontrive Performa. Confounding and biased variables were strictly followed by controlling inclusion-exclusion criteria. Data analysis was done by using SPSS version 20. Mean  $\pm$  SD was calculated for height, weight, BMI, and age. Categorically defined variables were calculated for gender, blood pressure, obesity, smokers/ non-smokers, family history of cardiovascular diseases, and impact of these on TVCAD, where two-sided probability value  $< 0.05$ , considered as statistical criteria of significance for diabetic v/s non-diabetics group. A Chi-square test was used to observe the effect of 3VD on diabetic and non-diabetic patients. For the graphical presentation of data, bar graphs and pie charts were used. Probability value  $< 0.05$  was used to check the significance criteria. Reference for the cutoff values used for the study as per WHO and Asian criteria is given in Table 1.

Weight	"WHO Criteria" BMI Cut Off (Kg/m <sup>2</sup> )	"Asian Criteria" BMI Cut Off (Kg/m <sup>2</sup> )
Under Weight	$<18.5$	$<18.5$
Normal	18.5-24.9	18.5-22.9
Over Weight	25-29.9	23-24.9
Pre-Obese	-	25-29.9
Obese	$\geq 30$	$\geq 30$
Obese Type 1 (Obese)	30-40	30-40
Obese Type 2 (Morbid Obese)	40.1-50	40.1-50
Obese Type 3 (Super Obese)	$>50$	$>50$

**Table 1:** BMI Standard Chart for Adults (both Male and Female) [10]

## RESULTS

Out of 250 patients, 75.6% were male while 24.4% were female with a mean age of 56.60 and standard deviation  $\pm 7.724$  and BMI mean was  $26.58 \pm 3.857$ . The mean  $\pm$  SD of height was  $1.63 \pm 0.095$  while weight was  $70.20 \pm 8.682$ . The prevalence rate of hypertension was found to be 60.8% while 47.2% of patients was Diabetes Mellitus. 105 (42%) were smokers and 145 (58%) were Non-Smokers. Obesity was noted in 50 (20%) patients whereas a Family history of



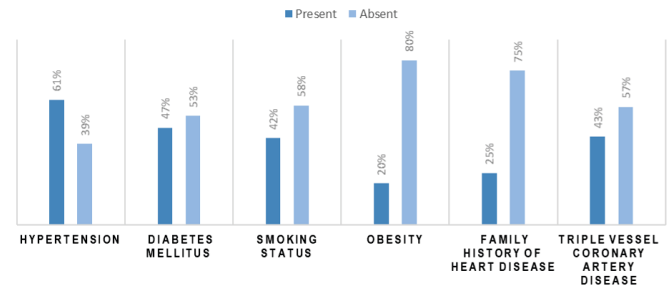
heart disease was documented in 63(25.2%) patients and Triple Vessel Disease was documented in 107(42.8%) patients (Table 2). However, Triple vessel disease was found in 11.6% of patients with family history and 31.2% in patients with no family history which shows a non-significant association between family history and triple vessel disease (p=0.549%). In stratification of BMI and triple vessel disease, 17 – 27 and > 27, BMI and triple vessel disease have no significant association i.e. (p= 0.662). Triple vessel disease was found 18.8% in smokers and 24.0% in non-smokers which shows a non-significant association between smoking and triple vessel disease i.e. (p= 0.594). As for the study main objective variable diabetes, the comparative analysis of triple vessel disease between diabetic versus non-diabetic resulted in significant difference was noted i.e., p-value =0.030 (Table 2).

	Triple Vessel Disease		p-Value
	3VD	Non 3VD	
<b>Age Group in Years</b>			
45 -5	50 (20.0%)	99 (39.6%)	0.001
8>58	57 (22.8 %)	44 (17.6 %)	
<b>Gender</b>			
Male	83 (33.2%)	106 (42.4 %)	0.530
Female	24 (9.6 %)	37 (14.8 %)	
<b>Family History</b>			
Yes	29 (11.6%)	34 (13.6%)	0.549
No	78 (31.2%)	109 (43.6%)	
<b>Body Mass Index (In Kg/m2)</b>			
17 - 27	68 (27.2 %)	87 (34.8%)	0.662
>27	39 (15.6%)	56 (22.4%)	
<b>Hypertension</b>			
Present	76 (30.4%)	76 (30.4%)	0.004
Absent	31 (12.4%)	67 (26.8%)	
<b>Obesity</b>			
Present	20 (8.0%)	30 (12.0%)	0.665
Absent	87 (34.8%)	113 (45.2%)	
<b>Smoking Status</b>			
Present	47 (18.8%)	58 (23.2%)	0.594
Absent	60 (24.0%)	85 (34.0%)	
<b>Diabetes Mellitus</b>			
Present	59 (23.6%)	59 (23.6%)	0.030
Absent	48 (19.2%)	84 (33.6%)	

**Table 2:** Association of demographics characteristics, baseline characteristics, and risk factors with triple vessel coronary artery diseases. Chi-Square T-Test Applied

In the stratification of age group 45 -58 and >58 years, triple vessel disease was found to be 20% and 22.8%, highly showed association between age and triple vessel disease with a p-value = 0.001. In the comparison of triple vessel disease between gender and triple vessel disease, males 33.2% and fhfg9.6% in females were evaluated beside no significant difference was noted in terms of p-value i.e.,

0.530. Triple vessel disease was found at 30.4% in hypertensive and 12.4% in non-hypertensive patients. P-value showed a significantly higher association between hypertension and triple vessel disease i.e., P=0.004. In the stratification of obesity, triple vessel disease was found to be 8.0% and 34.8% respectively which shows a non-significant association between obesity and early triple vessel disease (P=0.665)(Figure 1).



**Figure 1:** Graphical stratification of variables presence and absence in this study sample size of the diabetic and non-diabetic NSTEMI patients

## DISCUSSION

It's becoming increasingly prevalent in our community to have an acute coronary syndrome because of the fast adoption of a sedentary lifestyle, just like in other Asian countries. In a cohort study of 1263 diabetic patients who went through the angiographic screening, 430n had been diagnosed with MVD. After long-term follow-up, it has been validated that PCI has a low mortality rate and require less revascularization as compared to CABG [11]. Clinical investigation results in CAD with DM-II were poor regardless of progress in medicines. Furthermore, this article's findings suggested CABG was better than PCI in treating diabetic patients with MVD. CAD in comparison between diabetic and non-diabetic patients found to be CAD in diabetics had a significantly higher percentage of the extreme and unusual events. Diabetics have a higher danger factor profile and poor clinical results [12]. Retrospective data were retrieved of 2260 young females who went through PCI found out dyslipidemia was the main reason behind ACS in females [13]. A systematic review on the role of advanced glycation end products in the development of coronary artery disease among DM and non-DM, used any therapeutic agents in order to reduce the circulating AGE would be helpful to reduce the complication of DM for the treatment of CAD [14]. If a patient has NSTEMI with coronary artery disease in the left main or three arteries, they have a high mortality rate [15]. Because of this, the use of non-invasive diagnostic tools like the ECG is essential for the early and accurate detection of severe disease in the left main or three vessels CA. To sum up, the findings of these studies offer substantial evidence for increasing the ECG's ability to

predict clinical outcomes in patients with NSTEMI by taking into account the amount or distribution of ST-segment depression (STD) [16, 17]. In the present study Mean  $\pm$  SD of age was 56.60  $\pm$  7.724 years among them 75.6% were male and 24.4% were female. Hypertension was found in 60.8% while 47.2% were noted as diabetic. In a comparison of triple vessel disease between diabetic versus non-diabetic significant difference was noted i.e. ( $p=0.030$ ). Our results are comparable with all national and international studies. In the current study, triple vessel disease was documented in 42.8% of patients. Likewise, our study result, Shaikh et al., reported 30.2% of patients presented with triple vessel disease [18]. In the present study Mean  $\pm$  SD of age was 56.60  $\pm$  7.724 years among them 75.6% were male and 24.4% were female. Hypertension was found in 60.8% while 47.2% were noted as diabetic. In 74 comparisons of triple vessel disease between diabetic versus nondiabetic significant difference was noted i.e. ( $p=0.030$ ). On the other hand, in Tanindi et al., study 42.9% of patients were diabetic [19-22]. Results are comparable with all national and international studies. Study design which was cross sectional was our main limitation of the study.

## CONCLUSIONS

Diabetic Mellitus has a significant factor for 3VD among the patients of NSTEMI patients. As a risk factor and comorbid, DM screening is a necessary factor in all NSTEMI patients who diagnosed with 3VD.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The authors received no financial support for the research, authorship and/or publication of this article

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Diabetes Research. 2021 Jan; 2021: 6683937. doi: 10.1155/2021/6683937



## Original Article

## Impact of COVID-19 Pandemic on Medical Education: Predictors of Educational Difficulties and Poor Academic Performance

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## ARTICLE INFO

## Key Words:

Corona Virus Disease, Depression, Anxiety, Obsessive Compulsive Disorder, Post-Traumatic Stress Disorder

## How to Cite:

Malik, A., Umer Khan, A., Rauf, A., Ur Rahman, A., Anjum, O., & Saleem Shaukat, M. (2022). Impact of Covid-19 Pandemic On Medical Education; Predictors of Educational Difficulties and Poor Academic Performance : Impact of Covid-19 on Medical Education. Pakistan Journal of Health Sciences, 3(06). <https://doi.org/10.54393/pjhs.v3i06.331>

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Received Date: 7<sup>th</sup> November, 2022Acceptance Date: 19<sup>th</sup> November, 2022Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

COVID-19 is causing multiple psychological problems directly influencing the ability of learning among students. **Objectives:** To investigate the impact of COVID-19 pandemic on medical education and to explore the influence of different predictors of educational difficulties and poor academic performance. **Methods:** This cross-sectional study was conducted in Multan Medical & Dental College, Multan, over a period of one month. Through convenient purposive sampling, all the enrolled students from all specialties who agreed to fill the online survey questionnaire voluntarily were included. A self-developed, reliable and validated research instrument was used as a data collection tool to inquire about the demographic details, psychological predictors and educational difficulties. **Results:** A positive and significant correlation was observed between the psychological distress due to COVID-19 and students' educational learning difficulties in medical setting. It was found that depression and obsessive-compulsive disorder ( $p \leq 0.05$ ) significantly influenced the students' education and learning but anxiety and posttraumatic stress disorder had no significant impact. Females and students with psychiatric history showed higher level of psychological distress and educational difficulties as compared to males and students without psychiatric history. **Conclusions:** COVID-19 pandemic has tremendously affected the medical education as strong positive correlation has been observed between psychological predictors and students' educational learning difficulties. However, during this pandemic learning hazard were more significantly perceived in students with depression and obsessive compulsive disorder.

## INTRODUCTION

The existing outbreak of the Corona Virus Disease (COVID-19) pandemic has caused severe mental health problems [1]. In the last few months, enormous research has been published concerning the levels of anxiety and depression among psychiatric patients and general people due to COVID-19 [2, 3]. The methods of isolation like seclusion and communal distancing which have been advised to be executed worldwide in order to diminish the risk of contamination, may itself signify a tense life pattern. Many

adverse mental health consequences have been reported due to parting from the loved ones, loss of self-sufficiency and feelings of uncertainty [4]. It has also been reported that individuals with pre-existing mental illnesses are additionally predisposed to setbacks, avoiding medicines, anxieties, disgrace and reduced self-care behaviors during pandemics. This may add on to 'therapeutic mistrust', suspicion and hopelessness [5]. In this context of current pandemics, the major group affected is the students

whose learning capabilities were greatly disturbed due to the symptoms of petulance, wakefulness, expressive agony, panic, and anxiety, because of uncertain flow of education, monetary apprehensions, frustration and dullness, deficiency in provisions and deprived communication during this pandemic [5-9]. Furthermore, if such apprehensions are sustained, they might increase the chance of severe and disabling mental health situations, temperament or stress disorders, trauma-related conditions and Obsessive Compulsive Disorder (OCD). This concern is predominantly apparent in Italy, the very first hit European country in which the lockdown continued for a much more extensive time period [10, 11]. Additionally, amongst the extensive variability of obsessions and obligations, fear of germ contactivity, sensitivity of being infected and undue hand washing are commonest factors affecting around 50% of the patients [12]. Similarly, the threat of infection and the continuous talk on different precautionary measures and consequences of COVID-19 by health advisories may further deteriorate the symptoms of OCD [13, 14]. Known risk factors for Post-Traumatic Stress Disorder (PTSD) may include broadcast of increased mortality, insights of danger, involvement with infected patients, nutrition and reserve uncertainty. Such factors were felt by individuals with prior communicable disease occurrences such as Ebola as well as during the COVID-19 pandemic [15]. This comprehensive concern was similarly revealed in widespread media reporting which was serious and distressing, leading to aggressive communal response [16]. In the same context, it is also reported that the more the media coverage a disease receives, the more likely the students and young individuals will take it as an extortion whatever the factual health risk is there in it [17]. Unfortunately, the non-serious attitude towards this foremost mental health concern among leaning students and their educational capabilities adds a lot to the problem statement [18]. Some studies also stated that although anxiety disorders give good results to pharmacotherapy and psychotherapy, it may deteriorate in presence of strains and mental pressures because of environmental prompts [19, 20]. Likewise, undergoing or perceiving suffering associated with COVID-19 may end up in high occurrence of mental conditions leading to severe distress and incapacity among fighters, family members, first aids providers and the common public [21]. Many descriptive studies have confirmed that multiple mental health issues occurred more commonly amongst the fighters of the disease, families of the survivors, medical specialists, front line workers and in the general community after an outbreak of widespread communicable disease like SARS, MERS, Ebola, flu, HIV/AIDS [22]. COVID-19 being a life-

threatening disease is producing multiple psychological problems that are directly influencing the ability of learning among students. While reviewing the literature, there are not ample evidences providing association of the impact of COVID-19 pandemic on medical education and to explore the influence of different predictors of educational difficulties and poor academic performance.

## METHODS

This cross-sectional study was conducted over one month (September 2021) at Multan Medical & Dental College, Multan, Pakistan. Permission to conduct the study was obtained from the Institutional Review & Ethical Board of the same institution (IRB/MDC/-06). Through non-probability convenient purposive sampling, all the currently enrolled students of all specialties (Medicine, Dentistry, Nursing, Nutrition and Physiotherapy) were approached. Out of 500 enrolled students, a total of 416 students returned the sent online questionnaire and were therefore included in the study. A reliable and validated research instrument/questionnaire was used as a data collection tool to inquire about the demographic details, psychological/stress predictors (depression, anxiety, OCD, PTSD) and educational difficulties (delayed question solving time, mistakes in solving questions, unable to adapt to a changing, trouble in remembering, inability to focus) faced by the students during COVID-19 pandemic. The analyses were carried out through Statistical Package of Social Sciences (SPSS) version 21. Independent samples Student's t-tests were employed to identify the differences and mean scores of study variables were compared with respect to demographic characteristics (gender, history of psychiatric disorder) by using t-test. Pearson correlation was used to explore the relationship between depression, anxiety, OCD, PTSD and educational difficulties, whereas; predictors of educational difficulties were investigated using multiple regressions. The p-value of  $\leq 0.05$  was considered as statistically significant at the 95 % confidence level while power of the test was kept at 80%.

## RESULTS

A total of 416 students were included in the study. Among them 144 were males and 272 were females. Mean age of the students was found to be 22.5 years. Table 1 describes the mean comparison of depression, anxiety, OCD, PTSD and educational difficulties between male and female students of medical discipline. Females significantly showed more depression, anxiety, symptoms of PTSD and educational difficulties as compared to males. In addition, there was no significant difference between males and females in relation to OCD during COVID-19.

Variable	Gender	N	Mean ±SD	Df	t-test	p-value
Depression	Male	144	16.0764±6.20746	414	-3.299	.001
	Female	272	18.1765±6.15948			
Anxiety	Male	144	12.3056±5.64978	414	-3.410	.001
	Female	272	14.2610±5.51766			
Obsessive Compulsive Disorder	Male	144	9.0278±3.66030	414	-1.685	.093
	Female	272	9.6728±3.74160			
Posttraumatic Stress Disorder	Male	144	6.2727±2.53755	414	-2.356	.019
	Female	272	6.9816±3.09082			
Educational Difficulties	Male	144	15.3194±6.17309	414	-2.176	.030
	Female	272	16.6176±5.57546			

**Table 1:** Comparative Scores of Male and Female students for Depression, Anxiety, OCD, PSD and Educational difficulties  
Correlation matrix showed positive and significant correlation between depression, anxiety, OCD, PTSD and the students' educational difficulties (Table 2).

Scale	Mean ±SD	1	2	3	4	5
Depression	17.5215±6.32272	1				
Anxiety	13.6292±5.66903	.818**	1			
Obsessive Compulsive Disorder	9.4641±3.75508	.588**	.595**	1		
Posttraumatic Stress Disorder	6.7626±2.95702	.658**	.658**	.739**	1	
Educational Difficulties	16.2225±5.86178	.676**	.568**	.494**	.518**	1

**Table 2:** Correlation Matrix between Depression, Anxiety, OCD, PSD and Students' Educational Difficulties during COVID-19  
\*\*= positive and significant correlation

Results showed that those students who have had the history of psychiatric disorder were more depressive, had severe level of anxiety, symptoms of OCD & PTSD and problems related to educational learning (Table 3).

Variable	Psychiatric Disorder	N	Mean ±SD	Df	t-test	p-value
Depression	Yes	71	21.1690±5.77182	416	5.520	.000
	No	347	16.7752±6.17670			
Anxiety	Yes	71	16.9014±5.13296	416	5.524	.000
	No	347	12.9597±5.54577			
Obsessive Compulsive Disorder	Yes	71	10.4085±3.57602	416	2.338	.020
	No	347	9.2709±3.76650			
Posttraumatic Stress Disorder	Yes	71	7.9014±3.18099	415	3.614	.000
	No	347	6.5289±2.85810			
Educational Difficulties	Yes	71	18.6197±6.21603	416	3.844	.000
	No	347	15.7320±5.67218			

**Table 3:** Basic Statistical Scores of Depression, Anxiety, OCD, PSD and Educational difficulties with Respect to Pre-existing Psychiatric Disorders

Multiple regressions described the predictors (depression, anxiety, OCD, posttraumatic stress disorder) of educational difficulties and found that depression and OCD ( $p \leq 0.05$ ) significantly influenced the students' educational and learning difficulties due to COVID-19 but anxiety and PTSD had no significant impact on the learning (Table 4).

Model	Unstandardized Coefficients		Standardized Coefficients	T	p-value	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	4.452	.660		6.745	.001	3.154	5.749
Depression	.541	.060	.583	8.964	.001	.422	.659
Anxiety	-.019	.067	-.019	-.285	.776	-.152	.113
Obsessive Compulsive Disorder	.185	.085	.119	2.175	.030	.018	.352
Posttraumatic Stress Disorder	.118	.117	.060	1.009	.314	-.112	.349

**Table 4:** Multiple Regression Analysis for Students' Educational Difficulties

## DISCUSSION

This study was conducted to investigate the impact of COVID-19 pandemic on medical education and to explore the influence of some psychological predictors like depression, anxiety, OCD and PTSD on students' educational difficulties. The major aspect of this study identified a significant positive correlation between the study variables and revealed that hazards in learning were significantly related with psychological predictors in particular with depression and OCD among the medical and allied students during this pandemic. The present study has uncovered the novel phenomena in the discipline of medical science in perspectives of psychological disturbance and its consequences in form of educational difficulties among the medical students of Southern Punjab. Previous studies which were conducted in epidemics and pandemics situation reported psychological effects on work efficiencies of people from different modalities [21, 22]. Likewise, ample evidences from existing literature indicated that educational difficulties are significantly influenced by the symptoms of depression, stress, anxiety and OCD and PTSD triggered by such type of pandemic situations in the past [23]. Also, in the reflection of earlier studies, it was assessed that psychological problems and poor academic grades are positively correlated with each other. Educational difficulties are perceived in negative perspective by these symptoms of obsessive behavior, panic situation, stressful environment and apprehension [24]. Findings of this study indicated that obsessive behavior and depression have greatly influenced the educational inspiration in this pandemic. Depressive symptoms and obsessive-compulsive behavior predict educational difficulties among medical students more significantly as compared to their feeling of apprehension and stress due to COVID-19. Present study also reported that female medical students were found to have more depressive symptoms, anxiousness, obsessive behavior, stress related to trauma and educational difficulties as compared to male students. Furthermore, the association between psychological

problems and pre-existing psychiatric disorders during COVID-19 was also studied and it was observed that all those participants who had positive psychiatric history reported greater psychological problems and educational learning difficulty than those who had no pre-existing psychiatric disorders. This result is supported by one more similar study which reported that in patients with pre-existing psychiatric disorders symptoms may become worse due to spreading fear, anxiety, obsessive behavior, depression and PTSD during COVID-19 pandemic [22]. Exposure and the nature of psychological trauma is considered to be a most reliable and significant predictor of PTSD along with infectious disease. Epidemiologists indicated highest prevalence of PTSD among families of survivors, medical professionals and medical students during COVID-19 [22-24]. Pandemics are more than just mental and physical manifestations. They can have enormous psycho-social consequences. To stabilize the quality of life, it is needed to manage the psychological issues during COVID-19 in developing countries, where the students of medical field are developing the symptoms of OCD, depression, anxiety and PTSD which in turn can damage the ability of educational learning. In the present era, awareness is needed to overcome the obsessions about pandemic. However, to enhance the educational ability of students the psycho-education should be provided, initiative about online psychotherapy must be taken, debunking misinformation and facilitating tele-consultants. It is suggested that an urgent step must be taken to provide mental health services targeted at prevention of depression, anxiety, OCD and PTSD to students and other people exposed to COVID-19. Possible strategies must be utilized which are not limited to psychological problems but effective for general population by providing psychosocial support, systematic desensitization, counseling services and pharmacological treatment.

## CONCLUSIONS

COVID-19 pandemic has tremendously affected the medical education as strong positive correlation has been observed between psychological predictors and students' educational learning difficulties. However, during this pandemic learning hazard were more significantly perceived in students with depression and obsessive compulsive disorder.

## Conflicts of Interest

The authors declare no conflict of interest.

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Management of Patients with Prolonged Air Leak after Pulmonary Resection with Heimlich Valve

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## ARTICLE INFO

## Key Words:

Prolonged air leak, pulmonary resection, Heimlich valve, lobectomy, wedge resection

## How to Cite:

Sikander, N., Ahmad, T. ., Mazcuri, M., Zafar, R. ., & Naz, S. . (2022). Management of Patients with Prolonged Air Leak after Pulmonary Resection with Heimlich Valve: Prolonged Air Leak after Pulmonary Resection with Heimlich Valve. *Pakistan Journal of Health Sciences*, 3(06).<https://doi.org/10.54393/pjhs.v3i06.276>

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## ABSTRACT

Prolonged air leak (PAL) after pulmonary resection is defined as air leak persisting for five or more days. Majority can be managed conservatively using one-way device Heimlich valve (HV) while few may require surgical intervention. **Objective:** To evaluate safe discharge policy for Prolonged air leak and role of Heimlich valve in its management. **Methods:** A retrospective study was conducted in the Department of Thoracic surgery at Jinnah Postgraduate Medical Center, Karachi, including patients with PAL following pulmonary resection between the years 2019-2021. Cerfolio Grade IV air leaks were excluded. **Results:** File records of 467 patients were reviewed; seventy (15%) had PAL. Most common indication for resection was bronchiectasis (n=24; 34.3%); Lobectomy was the most common procedure (31/70; 44.3%) associated with PAL. Grade II (n=38) air leak was most commonly encountered. All grade III patients developed complications (p=0.02), followed by grade II (p=0.07) whereas Grade I had least complications (8/19; p<0.001). Lobectomy patients showed improvement of air leak on HV (p=0.008). Grade I PAL (n=19) discharged on HV had the least frequency of lung collapse (LC) and residual space (RS) (n=8; p=0.006 and n=1; p<0.001) respectively, whereas Grade III (n=13) discharged with HV developed significant number of complications; LC (n=12; 92.8%; p=0.03) and RS (n=11; 84.6%; p<0.001). **Conclusions:** PAL is an important factor complicating resections. Effective preoperative preparation and meticulous resection technique can decrease complications. Nonetheless, not all patients can be discharged on HV. Patients with smaller leaks can be safely sent home on HV whereas larger leaks require management in hospital with some form of intervention.

## INTRODUCTION

An air leak is defined as an egress of air from a break in pulmonary parenchyma or bronchial stump into the pleural space, evident by bubbling in the chest bottle [1]. Air leaks are the most frequently encountered complication after thoracic surgery, particularly pulmonary resection. [2, 3] If an air leak persists for more than five days, it is termed as Prolonged Air leak (PAL) [4]. In our study incidence of PAL after pulmonary resection was found to be 15%, however few studies quote up to 20-33% [5,6]. Various etiological factors have been identified for PAL after pulmonary resection including trauma due to lung manipulation, barotraumas, fissure dissection, underlying lung disease, infection and surgical technique [5]. Furthermore, certain factors increase the likelihood of PAL notably advanced age, reduced body mass index, chronic steroid use, chronic

obstructive pulmonary disease (COPD), diabetes mellitus, smoking, reduced pulmonary function, and adhesions [2,7]. Regardless of the cause, PAL has a strong impact on patient morbidity resulting in protracted hospital course, frequent complications, Intensive care admission, pneumonia, empyema, atelectasis and reintervention [2,7,8]. Management strategies vary from conservative to surgical intervention with no definite consensus [2,5]. These are prolonged drainage with underwater seal, pleuravac®, physiotherapy, chemical pleurodesis, fibrin patches, use of endobronchial valves, operative intervention or discharging patients home with Heimlich valve (HV) [5,9]. HV is a one-way valve device which maintains negative intra pleural pressure, promotes removal of excess air from pleural space, helps with lung

expansion and is superior to underwater seal alone [10]. This study aims to evaluate the optimum and safe discharge policy in patients with PAL and the role of HV in its management.

## METHODS

A retrospective cross-sectional study was carried out in the Department of Thoracic surgery, Jinnah Postgraduate Medical Center, Karachi from January 2019 to December 2021. It included patients with PAL following pulmonary resection. Ethical approval was attained from Institutional review board committee. PAL was defined as air leak that can be witnessed clinically for five days or more following pulmonary resection [4,11]. All patients presenting with benign or malignant parenchymal disease that required any form of pulmonary resection were included. Grade IV air leaks according to Cerfolio classification were excluded from this study [12]. Pulmonary resection performed included lobectomy, wedge and segmentectomy. All patients undergoing lobectomy had incomplete fissures. Both hand sewn and stapler technique were employed as no significant difference between the two in terms of air leak duration is found in literature [13]. All data that was documented prospectively was collected by three researchers retrospectively, through medical records whereas a separate researchers reviewed the variables. Data variables included age, gender, co-morbid, etiology, procedure type, grade of air leak according to Cerfolio classification, duration of air leak, day of application of Heimlich valve®, duration of tube or valve, complications pertaining to Heimlich valve®, need of re intervention or procedure. Common outcomes of patients influenced the development of research question. SPSS version 22 was utilized for data entry and analysis. Mean and standard deviation was utilized to represent descriptive data such as age, weight, duration of air leak or chest tube, etc. Categorical variables such as gender, disease, etiology, type of resection and others were presented as frequencies and percentages. Independent sample t test was applied for comparison of means; for categorical variables Chi square was utilized. P value  $\leq 0.05$  was taken as statistically significant.

## RESULTS

In this study, 467 patient records were reviewed, out of which 70 had PAL secondary to pulmonary resection. Thirty-seven (52.9%) were females and 33(47.1%) were males. The mean age and weight of patients were  $45.7 \pm 11.1$  years and  $49.4 \pm 7.9$  Kgs, respectively. Diabetes (n=35; 50%) was the most common co morbidity followed by COPD (n=32; 45.7%), tuberculosis history (n=25; 35.7%) and chronic steroid use (n=16; 22.9%). Patients' addictions included smoking (32; 45.7%), Betel (30; 42.9%) and Gutka

(18; 25.7%). Most common presenting complaint was hemoptysis (24; 34.3%), productive sputum (19; 27.1%), chest pain (12; 17.1%), dyspnea (8; 11.4%) and fever (7; 10%). Bronchiectasis (24; 34.3%) was the most common etiology and lobectomy (n=31; 44.3%) was the most common procedure performed. (Table 1)

	Etiology /Disease	Number (Percentage)
1	Bronchiectasis	24 (34.3%)
2	Aspergilloma	15 (21.4%)
3	Solitary pulmonary nodule	10 (14.3%)
4	Hydatid cyst	9 (12.9%)
5	Bulla	4 (5.7%)
6	Granuloma of lung	4 (5.7%)
7	Interstitial lung disease	2 (2.9%)
8	Lung carcinoma	2 (2.9%).
Procedures		
1	Lobectomy	31 (44.3%)
2	Wedge resection	29 (41.4%)
3	Segmentectomy	10 (14.3%)

**Table 1:** Etiology and types of procedure performed

Upper lobe (UL) involvement was found in 39 (55.7%), lower lobe (LL) in 23 (32.9%) and middle lobe (ML) in 11 (15.7%). All hydatid cysts were seen in LL (n=9/9;  $p < 0.001$ ) and 3 out of 4 granuloma cases in UL (75%;  $p < 0.001$ ). Bronchiectasis was seen involving UL and LL (n=8; 33.3% and 7; 29.1%, respectively) with both cases of interstitial lung disease (ILD) in LL ( $p = 0.04$ ) (Table 2).

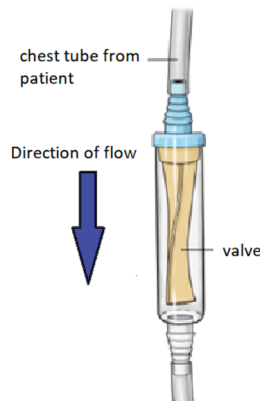
	Disease(n)	Procedure	Number/ number of Disease (%)	P value
1	Bronchiectasis	Lobectomy	21/24 (87.5%)	<0.001*
		Wedge resection	3/24 (12.5%)	<0.001*
2	Aspergilloma	Wedge resection	8/15 (53.3%)	0.12
		Lobectomy	4/15 (26.6%)	0.29
		Segmentectomy	3/15 (20%)	0.47
3	Solitary pulmonary nodule	Wedge resection	10/10 (100%)	<0.001*
4	Hydatid disease	Segmentectomy	5/9 (55.5%)	<0.001*
		Lobectomy	2/9 (22.2%)	0.15
		Wedge resection	2/9 (22.2%)	0.21
5	Granuloma	Wedge resection	3/4 (75%)	0.16
		Lobectomy	1/4 (25%)	0.42
6	Interstitial lung disease	Wedge resection	2/2 (100%)	0.08
7	Bulla	Segmentectomy	2/4 (50%)	0.03*
		Wedge resection	1/4 (25%)	0.49
		Lobectomy	1/4 (25%)	0.42
8	Carcinoma of lung	Lobectomy	2/2 (100%)	0.18

\*Significant

**Table 2:** Relation of procedure with disease.

Most common grade of air leak encountered was grade II (38; 54.2%), followed by grade I (19; 27.1%) and grade III (13; 18.6%). Post-operative lung expansion was seen in 27 (38.6%) with Grade III patients showing no immediate post-operative lung expansion (0/13;  $p = 0.002$ ), whereas 14 out of 19 (73.6%) patients with grade I leak showed complete lung

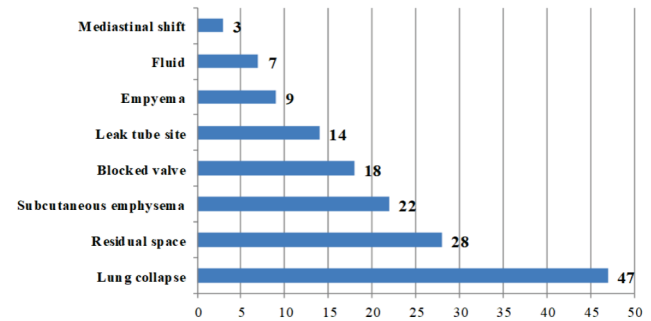
expansion ( $p < 0.001$ ). Adhesions were seen in 64 (91.4%) associated with 35 (54.68%) developing Grade II air leak. HV was attached by  $5.6 \pm 0.88$  day. In majority of Lobectomy and wedge resections HV was applied by day 6 ( $p = 0.01$  and  $0.009$ ), however in carcinoma of lung undergoing lobectomy HV was attached by day 7 ( $p = 0.001$ ). Mean duration of chest tube from surgery and days of air leak were  $18.1 \pm 4.9$  days (8-27) and  $13.4 \pm 4.1$  day (5-19), respectively.



**Figure 1:** Pictorial presentation of Heimlich valve.

Complications were found in 53 (75.7%) patients who were discharged with HV (Figure 2). All patients with grade III developed complications (13/13; 100%;  $p = 0.02$ ), followed by 32 out of 38 grade II air leak patients having complications ( $p = 0.07$ ). Grade I patients had the lowest complications (8/19;  $p < 0.001$ ). Table 3 represents relation of grade of air leak and complications. Out of 29 patient undergoing wedge resection 27 (93.1%;  $p = 0.004$ ) developed complications whereas 17 out of 31 (32.07%;  $p < 0.001$ ) lobectomy patients developed complications; valve fluid accumulation was seen in 6/31 (19.3%;  $0.02$ ) followed by residual space (RS) in 4/31 (12.1%;  $p < 0.001$ ). Lobectomy patients showed improvement of air leak by at least one grade with HV in 20/31 (64.5%,  $p = 0.008$ ) and complete resolution of leak in 21/31 (67.7%;  $p = 0.002$ ). Segmentectomy was significantly associated with RS (9/10;  $p < 0.001$ ). Re-admission was required in 43 (61.4%) patients with lowest rate in grade I (5; 26.3%;  $p = 0.001$ ). Re-intervention was required in 34 (48.6%) patients; chest tube in 5 (7.1%) patients, tube with suction in 21 (30%) patients, decortications in 5 (7.1%), and completion lobectomy in 3 (4.3%). Grade I had the lowest re-intervention rate (4/19; 21%;  $p = 0.005$ ) whereas 19/38 (50%;  $p = 0.79$ ) with Grade II and 11/13 (84.6%;  $p = 0.04$ ) Grade III patients required re-intervention. Complete resolution of leak in bronchiectasis patients discharged on HV was seen in first week in 9 ( $p = 0.01$ ) and by second week in 12 ( $p < 0.001$ ). Hence 21 out of 24 (87.5%) patients with bronchiectasis showed complete air leak resolution ( $p = 0.002$ ).

### Complication of hemlich valve



**Figure 2:** Complications seen in patient discharged with HV

Grade of air leak	Complication	Number/Percentage	P value
Grade I n = 19	Lung collapse	08; 42%	0.006*
	Residual space	01; 5.2%	<0.001*
	Empyema	01; 5.2%	0.24
	Readmission	05; 26.3%	0.001*
Grade II n = 38	Lung collapse	27; 71.05%	0.44
	Residual space	16; 42.1%	0.44
	Empyema	06; 15.7%	0.42
	Readmission	25; 65.7%	0.44
Grade III n = 13	Lung collapse	12; 92.3%	0.03*
	Residual space	11; 84.6%	<0.001*
	Empyema	02; 15.3%	0.7
	Readmission	13; 100%	0.007*

\*Significant

**Table 3:** Relation of grade of air leak and complications.

Duration of PAL and HV contributed as an important factor in complications. Bronchiectasis, Solitary pulmonary nodule (SPN) and carcinoma of lung had PAL for < 2 weeks (16/24;  $p = 0.001$ , 6/10;  $p = 0.03$  and 2/2;  $p < 0.001$ , respectively). In aspergilloma patients 12 (80%;  $p < 0.001$ ) had PAL for > 2 weeks. Table 4 represents various factors and their association with PAL and HV attached for >2weeks.

	Factors	No. of cases (%)	P value
<b>DURATION OF AIR LEAK &gt; 2 WEEKS</b>			
1	Complications	34/53 (64.1%)	<0.001*
2	Lung collapse	33/47 (70.2%)	<0.001*
3	Residual space	19/28 (67.8%)	0.02*
4	Fluid	4/7 (57.1%)	0.006*
5	Mediastinal shift	2/3 (75%)	0.003*
6	Block valve	10/18 (55.5%)	0.02*
7	Re-intervention	26/34 (76.4%)	0.001*
8	New tube placement	3/5 (60%)	0.001*
<b>DURATION OF HEIMLICH VALVE &gt; 2 WEEKS</b>			
1	Complication	46/53 (86.7%)	<0.001*
2	Lung collapse	43/47 (91.4%)	0.001*
3	Leak tube site	10/14 (71.4%)	<0.001*
4	Residual space	25/28 (89.2%)	0.008*
5	Block valve	16/18 (88.8%)	0.05
6	Empyema	9/9 (100%)	0.005*

\*Significant

**Table 4:** Duration of air leak and HV

Patients were discharged with different sizes of chest tube, 14 out of 46(30.4;  $p=0.003$ ) patients with 32 Fr. tube had tube site leak (TSL). None of the patients with 28 Fr. tube ( $p=0.003$ ) had TSL, however, they had RS formation in 14/24(58.3%;  $p=0.02$ ) cases. Average stay was  $7.4 \pm 1.15$  days with no mortality.

## DISCUSSION

Our review included 70 patients with PAL following pulmonary resection. Bronchiectasis (34.3%) was the leading etiology followed by aspergilloma of lung(21.4%). In literature, PAL incidence after resection was found to be between 8-26% however it varies according to the type of resection; segmentectomy (10-15%), lobectomy (9-13%) and wedge resection (3.3%)[14]. We found PAL incidence of 15% with similar or slightly higher incidence for the different types of resections. Our incidence of PAL with lobectomy was 16% (31/191) as it involved completion of the fissure. Another study also supported higher association of lobectomy with PAL as it involves resection of more pulmonary parenchyma as compared to lesser resections, gravitational effects and a larger residual space [11]. Factors such as COPD and smoking are associated with fragile lung parenchyma causing tobacco induced lung damage, thus lead to reduced healing capacity and PAL [6]. Furthermore, tuberculosis history is strongly correlated with lung scarring and impaired gas exchange ultimately leading to PAL [15]. In our study, diabetes was found in 35 (50%), COPD in 32 (45.7%), tuberculosis history in 25 (35.7%) and 32 (45.7%) patients were smokers. Previous studies have shown adhesions to be an important risk factor for PAL due to parenchymal tears during mobilization of lung [11]. We found adhesions in 64(91.4%) associated with 35(54.68%) developing Grade II air leak. Treatment modalities for PAL range from conservative techniques such as application of Heimlich valve (HV), implantable devices notably tissue adhesives and endobronchial valves, chemical pleurodesis to surgical intervention [15, 16]. PAL increases the length of hospital stay and impacts additional cost on healthcare system[15]. Castillo et al. described PAL as the second most common cause of prolonged hospitalization post-lobectomy [15]. In our study, average length of hospital stay was  $7.4 \pm 1.15$  days which was similar to 7.9 days found in another study[4]. HV has shown to be effective for PAL by allowing the lung to heal, residual lung to expand, reduce nosocomial infections, allow patient mobility and manage patients in an outpatient setting [17,18]. HV has proved to be beneficial in lobectomy cases resulting in resolution of PAL [19]. Same was seen in our study, where HV in lobectomy cases with PAL showed improvement of grade of air leak (64.5%,  $p=0.008$ ) and its resolution in 67.7% cases ( $p=0.002$ ). Nonetheless, there are certain complications of HV. J.

Matthew reported empyema in 16.9% patients when discharged home on HV requiring reoperations in 22.9% [7]. In our review, empyema occurred in 12.9% patients. Most complications were seen in patients undergoing wedge resection( $p=0.004$ ) followed by lobectomy( $p<0.001$ ) and segmentectomy( $p<0.001$ ). Reoperation was mandated in 11.4%, while 37.1% were managed by reinsertion of chest tube attached to suction. The overall readmission rate in our study was 61.4% which is higher than what was observed in previous studies(19.4-26.3%)[4,7]. Aggressive early discharge for PAL with HV attributes to shorten hospitalization and cost benefits but it is not without consequence [7]. Our primary goal was to establish which grade of PAL can be safely discharged on HV. This study demonstrates that Grade I PAL can be safely discharged home on HV as it has the least frequency of lung collapse (LC) and residual space (RS) (8/19;  $p<0.006$  and 1/19;  $p<0.001$ ), respectively. Patients with Grade II PAL do not show significant values whereas Grade III PAL when discharged with HV developed significant complications; LC(92.3%;  $p<0.03$ ) and RS(84.6%;  $p<0.001$ ). Duration of air leak > 2 weeks was statistically consistent with complications ( $p<0.001$ ), of which most common was LC (33/47;  $p<0.001$ ). Moreover, prolonged use of HV can lead to dysfunction of valve mechanism due to disruption of rubber leading to complications such as tube site leakage, blocked valve, empyema and lung collapse [17]. This was consistent with our findings; prolonged use of HV > 2 weeks led to complications ( $p<0.001$ ) notably LC (91.4%;  $p<0.001$ ), RS (89.2%;  $p<0.008$ ) and tube site leak (71.4%;  $p<0.001$ ). Patients with bronchiectasis can be safely discharged on HV as complete resolution of PAL was witnessed ( $p=0.002$ ) when duration of leak did not exceed two weeks ( $p=0.001$ ). On the other hand, 80% patients with aspergilloma had PAL for more than 2 weeks ( $p<0.001$ ) and should not be discharged on HV. Considering available data, patients with PAL can be safely discharged with a portable device by Day 4-8 depending on the underlying etiology, procedure performed and grade of air leak [3,20]. However, we attached HV by  $5.6 \pm 0.88$  day and observed for few days before sending home. Our study has certain limitations: It is a single centre, retrospective study with small sample size. However, it does lay grounds for future prospective research on this subject.

## CONCLUSIONS

PAL after lung resection is a vexing problem faced by thoracic surgeons that increases hospitalization. It can be concluded by our study that patients can be safely sent home on Heimlich valve for Grade I PAL. However, patients with Grade III PAL are more likely to develop complications so they are better to be managed in hospital. A more strategic plan focusing on optimizing preoperative risk

factors, meticulous intraoperative technique and optimum postoperative management can result in improved outcomes and readmission.

### Conflicts of Interest

The authors declare no conflict of interest

### Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Oral Health Status and Oral Hygiene Practices Among Urban Slum Dwellers in Rawalpindi, Islamabad, Pakistan

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## ARTICLE INFO

## Key Words:

Oral Health, Urban Slums, DMFT Index, CPITN Index.

## How to Cite:

Farrukh Habib, M. ., Mahmood, H. ., Khizar, A., Idrees, S., Pervaiz, F. ., & Khan, J. (2022). Oral Health Status and Oral Hygiene Practices among Urban Slum Dwellers in Rawalpindi, Islamabad, Pakistan: Oral Health and Hygiene Practices Among Urban Slum Dwellers. *Pakistan Journal of Health Sciences*, 3(06). <https://doi.org/10.54393/pjhs.v3i06.306>

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Received Date: 28th October, 2022

Acceptance Date: 12th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

Poor oral hygiene is a major factor for oral diseases. Urban slums are recognized as a risk group population as the burden of oral diseases is highest among them. **Objectives:** To evaluate the oral health status of slums using Decayed, Missed, and Filled Tooth index. To evaluate the oral health status of slums using Community Periodontal Index for Treatment Need. **Methods:** A cross-sectional study was carried out on 385 urban slum people aged between 20 to 50 years. A convenient sampling method was adopted. Data were collected by structured questionnaire included information related to patient's knowledge, attitude, and behavior towards oral hygiene and interviewed by trained staff. Oral examinations were performed in line with WHO guidelines. After taking informed consent oral examinations were done by fresh graduate and DMFT and CPITN index were evaluated. **Results:** Study participants were assessed for attitude, knowledge and oral health behavior, 47% had Good Attitude, only 6% had Very Good Knowledge and <1% had Very Good oral health behavior. Mean DMFT and CPITN score among Slums came  $8.91 \pm 7.627$  and  $1.93 \pm 0.971$  respectively. More than a third of the slums population required emergency levels dental treatments. **Conclusions:** The residents of slums have poor oral hygiene and high prevalence of dental caries. Low socioeconomic status, and lack of primary dental care programs and session are main reasons for poor oral health.

## INTRODUCTION

About 900 million people live in slums, but some informants confirmed that total slums population may exceed above 1.6 Billion which represents total  $\frac{1}{4}$  of total urban population [1]. Pakistan population reported to be 40.1% living in slums according to world bank collection of development indicators collected from official recognized resources [2]. Approximately 11.9 million resides in slums underdeveloped areas. 86% are permanent settlers, 13% are temporary displaced and 1% belong to other nationalities [3]. Slums area in Islamabad includes Sihala, Tarnol, Rawal dam, Bani gala, Barakahu and Golra, and in Rawalpindi includes Nala Lai and near DhokSayedan. R. Harris, in International Encyclopedia of Human Geography,

2009 A slum is a residential area with substandard housing that is poorly serviced and/or overcrowded, and therefore unhealthy, unsafe, and socially undesirable [4]. The limitations to health placed on slum populations are uncommon given the combination of their urbanized lifestyle and limited access to healthcare, usually as a result of being relatively Poor Oral hygiene knowledge, behavior and practices at an early age is one of the essential component of individual's health state later in life as well. Periodontal disease is a public health problem and is strongly associated with systemic diseases [5]. Oral health problems are much prevalent in urban slum dwellers. Prevalence of gingivitis and plaque accumulation was

remarkably high among slum dwellers [6]. According to the multivariate logistic regression analysis results, factors such as increasing age, being the only child, lack of regular annual dental check-up, and heavy dental calculus were significantly associated with higher prevalence of gingivitis [7]. The aim of present study was to assess the knowledge, attitudes and behavior about oral hygiene practices, and oral health status of urban slum dwellers in Rawalpindi, Islamabad, with an objective to find out oral health problems of slums dwellers and frequency of distribution of oral diseases, to plan a far reaching dental preventive program in future.

## METHODS

This Analytical cross sectional survey was conducted in urban slums area of Rawalpindi, Islamabad region, Pakistan. The natural clusters of slums in Rawalpindi and Islamabad were identified and required sample was fulfilled by convenient sampling. Sample size determination was done with WHO calculator since no data was available we took prevalence as 50%. The Final sample size was 385. All participants of the study were given detailed study information, aims, objectives, and explanations and all were asked to sign informed consent before start of study. Inclusion Criteria includes participants residing in urban slums area for more than 2 years and who gave informed consent. Exclusion Criteria include participants who migrated newly to slums area and who are bed ridden due to severe illness. The study was reviewed by Ethical Committee of Armed Forces Postgraduate Medical Institute Rawalpindi, Pakistan and granted ethical clearance. Also permissions were taken from local slum authorities. For data collection tool a modified WHO questionnaire was used for measuring the oral health status and oral health behaviors of participants. The questionnaire consists of 10 variables. Two were related to attitude of participants towards oral health, tooth cleaning was a part of general body cleanliness or not, is it easy for you to clean your tooth before going to bed. Four were related to Knowledge, cause of gum diseases, 1st sign of gum disease, cause of tooth decay, and time for brushing. Last 4 variables were related to behavior, use of toothbrush and toothpaste during brushing, use of saunsapari, meetha pan, use of tobacco (smoking), last was related to dental visits every 6 months or not. Study participants were assessed for their attitude, knowledge and behavior towards oral health, variables were assessed as, 1 for correct answer, 0 for wrong. Points were awarded accordingly. Variables marks were added for individual group. CPITN or Community Periodontal Index for Treatment Needs assesses the presence or absence of gingival bleeding on probing, supra or subgingival calculus

and periodontal pockets by using a 0.5 mm ball tip WHO probe. CPITN may be used as a general indicator of bleeding and pocket depth [5]. CPITN index were marked (0 for Healthy, 1 for Bleeding Gums, 2 for Calculus, and 3 for Pocketing). DMFT is the sum of the number of Decayed, missing due to caries, and Filled Teeth in the permanent teeth. DMFT index, values were distributed as, Score 0 means Healthy or no caries, Score 1 explain mild caries and DMFT values 1 to 7, Score 2 moderate caries experience and DMFT value 8 to 14, Score 3 severe caries and DMFT value 15 to 21 and Score 4 very severe caries level of respondents and DMFT value 22 to 28. For data collection procedure a modified questionnaire was translated to Urdu and trained dentists interviewed the participants and their responses were reported and again translated to English for SPSS. For oral examination fresh dentist were trained to record findings on oral examination. WHO probe community Periodontal Index probe and Instruments were used for periodontal status that were double sterilized before and after procedure, oral examination was done under daylight and visual tactile sensation and patient was seated on usual household chair. A pilot study was conducted earlier on 30 participants to check validity and reliability of questionnaire. Kappa statistics was used and found to be 0.85. For statistical analysis SPSS version 22.0 was used descriptive analysis was done, Mean and Percentage were calculated.

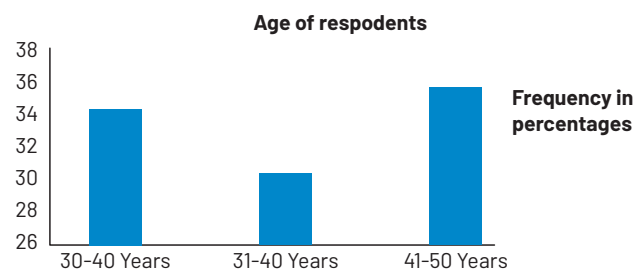
## RESULTS

All the 385 participants successfully completed the questionnaires. Out of which 49.9% were Male and 50.1% were female. Gender distribution can be seen in Table 1.

Sr No	Variable	Percentage
1	Male	49.9%
2	Female	50.1%
3	Total	100%

**Table 1:** Gender distribution of respondents

Furthermore, as Figure 1 explains, 1st group of 20-30 years of age had 131(34%) respondents, 2nd group of 31-40 years of age had 116(30.2%) respondents. 3rd group was of 41-50 years of age had 138(35.8%) participants.



**Figure 1:** Age distribution of respondents

Out of total 170 individuals (44.2%) never attend school, 114



(29.6%) received primary education only (till class 5), 47 (12.2%) and 29 (7.5%) participants with education till grade 8 and 10 respectively. 22 individuals (5.7%) did Intermediate and 3 (0.8) held Bachelor's degree or above. In relation to occupational status of respondents, only 2 (0.50%) were students, rest all, 126 (32.7) were laborers, 120 (31.1%) were house helpers, 78 (20.2%) were Class 4 workers and 59 (15.5%) reported no current occupation. For attitude 2 variables were assessed and cumulative score 0 indicated Poor Attitude, score 1 Satisfactory Attitude, score 2 Good Attitude. 32 (8.3%) had Poor Attitude, 172 (44.7%) had Satisfactory Attitude and 181 (47%) had Good Attitude. Similar pattern was adopted for knowledge and oral health behavior with 4 variables each score 0 indicated Very Poor, score 1 Poor, score 2 Satisfactory, score 3 Good, and score 4 Very Good. 103 (26.8%) had Very Poor Knowledge, 117 (30.4%) had Poor Knowledge, 98 (25.5%) had Satisfactory Knowledge, 44 (11.4%) had Good Knowledge and 23 (6%) had Very Good Knowledge. Similarly, for oral health behavior, 151 (39.2%) had Very Poor Behavior, 134 (34.8%) had Poor Behavior, 81 (21%) had Satisfactory Behavior, 18 (4.7%) had Good Behavior and 1 (0.3%) had Very Good Behavior. CPITN and DMFT index was used for evaluation of oral health status. Table 2 explains results as, 38 (9.9%) were Healthy, 82 (21.3%) had Bleeding Gums, 135 (35.1%) had Calculus, 130 (33.8%) had Pocketing.

Sr No	Code	CPITN index	Frequency	Percentage
1	0	Healthy	38	9.9%
2	1	Bleeding Gums	82	21.3%
3	2	Calculus	135	35.1%
4	3	Pocketing	130	33.8%
5		Total	385	100%

**Table 2:** CPITN Index for respondents

Table 3 explain results as 49 (12.7%) were healthy, 127 (33%) had score 1, 98 (25.5%) had score 2, 86 (22.3%) had score 3 and 25 (6.5%) respondents score 4.

Sr No	Code	DMFT index score	Frequency	Percentage
1	1	Healthy	49	12.7%
2	2	1 to 7	127	33%
3	3	8 to 14	98	25.5%
4	4	15 to 21	86	22.3%
5	5	22 to 28	25	6.5%
6		Total	385	100%

**Table 3:** DMFT index of respondents

Table 4 demonstrates that, mean value for DMFT and CPITN index is 8.91 + 7.63 and 1.93 + 0.97 respectively. More than a third of the slums population required emergency levels of dental treatments.

Sr No	Index	Frequency	Mean ± SD
1	DMFT index	385	8.91 + 7.63
2	CPITN Index	385	1.93 + 0.97

**Table 4:** Mean and standard deviation values for DMFT and CPITN

indices

## DISCUSSION

This cross sectional study was conducted on 385 urban slums dwellers of Rawalpindi/ Islamabad to evaluate oral health status and oral hygiene practices among slums. Chawla et al., studied that in the urban sum population, out of total study subjects, the majority of the population 54.2% never attended school. These findings were not in accordance with figures obtained as Pakistan literacy rate is 62.3% [8]. Lack of education and schooling might be the major factor for lack of dental knowledge and poor oral health behavior, followed by poor oral health. Inamdar et al., study was conducted in 2018 in Islamabad region to evaluate the knowledge and attitude for respondents but they were unable to measure the oral health status so no clear data was available for this region [9]. Our findings regarding knowledge and oral health behavior of slums were similar to research as Assessment of Oral Health and Hygiene awareness among Adolescents of Slum areas-A study in Visakhapatnam city AP where lack of oral health awareness and knowledge was found [10]. Shireen et al., findings were similar to a study carried out to evaluate dentition status and treatment need in urban dwellers in Indore city, central India where caries prevalence was 76.2% [11]. Australian institute of Health and Welfare explains DMFT score of 0 to 1.1 is considered very low, 2.8 to 4.4 moderate and 6.6+ very high [12]. 12.7% of slums population had healthy oral status and 6.5% had DMFT score 22 to 28. Mean DMFT score among slums was 8.91 that is highest. According to the American Dental Association (ADA), just 52.3 percent of adults reported that they had visited their dentist every six months for the past few years [13]. Our data was not in accordance American Dental Association as only 0.1% visit dentist every 6 months, and total of 14.6% had visited dentist during emergency. Severe periodontal diseases were estimated to affect around 14% of the global adult population, representing more than one billion cases worldwide [14]. The CPITN index of slums population explains 9.9% had healthy peridontium, 35.1% had calculus and 33.8% had pocketing. Our results were according to a study carried out to measure the prevalence of gingivitis, plaque accumulation and decayed, missed and filled teeth among slum population in Bangladesh, where high percentage of moderate and abundant plaque accumulation was observed between age 30-60 years [15]. The high CPITN score is due to some factors as 3.5% did brushing twice after breakfast and before going to bed 64.9% brush only in morning and 31.6% never brush or use other methods like miswak or manjan. Krishnan et al., found that out of total population 46.2% were smokers, tobacco might be the cause of poor oral health status as our analysis was

according to a research title as Tobacco [16]. Yadav et al., found that use and oral Health Status among Adolescents in an Urban Slum, Gurugram where the relationship between dental caries and tobacco utilization was observed to be factually significant ( $p < 0.0001$ ) [17]. Osuh et al., worked on prevalence and determinants of oral health conditions and treatment needs among slum and non-slum urban residents [1]. They explained the prevalence of oral diseases (slum vs non-slum sites): dental caries (27% vs 23%), gingival bleeding (75% vs 53%) and periodontal pocket (23% vs 16%), the results here proved that slums had significant no of untreated decayed tooth among slums population. They concluded the study that prevalence was much higher in slums. Thirty-five percent and 27% of residents in the slum and non-slum sites respectively required the "prompt and urgent" levels of treatment need [18-20]. Our results were related to a research carried out in Nigeria title as Dental caries and oral health: an ignored health barrier to learning in Nigerian slums: a cross sectional survey where dental caries, which was mainly untreated was prevalent in the urban slum [7]. These studies and results clearly shows that there was no preventive program in place to stop the progression of oral diseases.

## CONCLUSIONS

The study population was from slums but they had Good attitude towards cleaning tooth and oral hygiene. But their knowledge about brushing technique and cause of oral diseases was not satisfactory. Similarly, their behavior regarding use of toothbrush and toothpaste, dentist visit and dental treatment was deficient. And present study here revealed the high prevalence of oral disease among residents of urban slums.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Predictors of Outcome in the treatment of In-Stent Restenosis with Drug-Eluting Balloons

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## ARTICLE INFO

## Key Words:

In-stent restenosis, Drug-eluting balloons, Target Lesion Revascularization (TLR)

## How to Cite:

Faraz, N. ., Qadir Bhutto, A., Ellahi Soomro, I. ., Khan, J. ., Nawaz, M. ., & Humza, M. . (2022). Predictors of Outcome in The Treatment of In-Stent Restenosis with Drug-Eluting Balloons: Outcomes in the treatment of In-Stent Restenosis with Drug-Eluting Balloons. *Pakistan Journal of Health Sciences*, 3(06). <https://doi.org/10.54393/pjhs.v3i06.325>

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[qadira41@gmail.com](mailto:qadira41@gmail.com)Received Date: 5<sup>th</sup> November, 2022Acceptance Date: 15<sup>th</sup> November, 2022Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

The prognosis of coronary revascularization in patients has been significantly altered by the interventional cardiology. With the advancement of the novel drugs and stent technology the new complications i.e., in-stent restenosis, have emerged. **Objective:** To analyze the predictors of outcome in the treatment of in-stent restenosis with drug-eluting balloons. **Methods:** It was a retrospective study conducted at Pir Abdul Qadir Shah Jeelani Institute of Medical Sciences Gambat for the duration of one year from August 2021 to July 2022. The patients older than 18 years were eligible for the trial. The patients who have undergone coronary intervention with a drug-eluting balloon during the duration of the study were also eligible. This study received approval from the institution's research ethics board. The patient demographic features, procedure complications and operative results were recorded. **Results:** The mean age of patients was 65 years. There were 62 male participants. There were 54 patients that had history of diabetes mellitus, 87 had hypertension, 32 reported about smoking habits. There were 91 patients that reported about history of percutaneous coronary intervention (PCI), 72 about myocardial infarction (MI) and 30 reported about coronary artery bypass graft (CABG). Kidney related inflammation or infection was found in case of 19 patients. **Conclusions:** This single center study showed significantly low rate of target lesion revascularization (TLR) for a period of one year and moderate rate was found at five years.

## INTRODUCTION

The prognosis of coronary revascularization patients has been significantly altered by the interventional cardiology. The continuous efforts in this field have ultimately leads to the advancement. With the advancement of the novel drugs and stent technology the new complications i.e., in-stent restenosis, have emerged. The possible solution to such complications is drug-eluting balloons [1, 2]. For the percutaneous intervention of stenotic coronary arteries, the standard balloon angiography is usually recommended. However, there are few limitations associated with its flow-restricting dissections and recoil. The bare metal stents have emerged as more effective in the past years as it

decreases plain old balloon angiography (POBA's) initial recoil, dissection, and recurring intimal constriction [3, 4]. The drug-eluting stents has been created by combining the scaffolding of bare metal stents (BMS) with an anti-proliferative agent. Bare metal stent is emerged to be the optimal treatment for all patients with coronary artery disease (CAD). There are few limitations that has add to the medical expenses and associated complications of BMS, such as the inability of stents to fit in small channels, long-term dual antiplatelet medication and the installation of a second stent layer. This has made drug-eluting stents- in-stent restenosis (DES-ISR) treatment challenging. The

stent fracture, misplacement and under expansion leads to the DES-ISR. DES-ISR patients exhibited poorer clinical outcomes than bare metal stents-in-stent restenosis BMS-ISR patients, according to research [5, 6]. These concerns have sparked a discussion on whether recurrent stenting is the most effective treatment for ISR. DEBs are now a realistic alternative. Interventional cardiology has significantly altered the prognosis of patients requiring coronary revascularization. Bare metal stents (BMS) evolved as an effective treatment, offering a framework for the coronary artery's support and reducing POBA's initial recoil, dissection, and recurring intimal constriction [7, 8]. Restenosis continued to occur in vessels treated with BMS despite an improvement over POBA. It has been found that DES-ISR patients had worse clinical results than BMS-ISR patients. These concerns have prompted the debate of whether repeat stenting is the most effective treatment for ISR. DEBs have become a viable option. Randomized controlled trials have demonstrated that both DES and DEB are efficacious in treating BMS and DES-ISR [9, 10].

## METHODS

The study was carried out to analyze 113 lesions found in 92 patients that were treated with paclitaxel- eluting balloon. It is a retrospective study conducted at Pir Abdul Qadir Shah Jeelani Institute of Medical Sciences Gambat for the duration of one year from August 2021 to July 2022. The patients older than 18 years were eligible for the trial. The patients who have undergone coronary intervention with a paclitaxel-eluting balloon during the duration of the study was also eligible. This study received approval from the institution's research ethics board. The data of the patients treated in the cardiac catheterization in laboratory were assembled in the health information system database, which was consulted for this study. The patient demographic features, procedure complications and operative results were documented. The repeat vascularization report was also documented. For unfavorable outcomes repeat catheterization angiograms were examined. The baseline characteristics of population were reported as the mean and median for continuous variables, and as the frequency for categorical variables. Kaplan-Meier plots were used for plotting mortality major adverse cardiovascular events (MACE) results. The TLR outcomes were characterized. The cumulative incidence function was used for this purpose. TLR was determined. Survival rates were calculated. In cases of likelihood function non-convergence, Firth's penalized maximum likelihood technique for reducing bias was applied. The overall model selection strategy stated by Collet was used. Then, using automatic backward selection, a multivariable model was fitted with all significant univariable predictors, and those predictors that were not significant at the 0.10

level were discarded. The univariable and multivariable models were summarized. In cases of likelihood function non-convergence, Firth's penalized maximum likelihood technique for reducing bias was applied. Unless otherwise noted, the criterion for statistical significance was a two-sided value of 0.05. All analyses were conducted using SAS statistical software version 9.4 (SAS Institute Inc., Cary, North Carolina, United States) or R version 3.6.1 with the `coxphf`.

## RESULTS

There were 54 patients that had history of diabetes mellitus, 87 had hypertension, 32 reported about smoking habits. There were 91 patients that reported about history of PCI, 72 about MI and 30 reported about CABG. The baseline features of the patients are shown in table 1. Kidney related inflammation or infection was found in case of 19 patients.

Baseline features	Total patients n=92
Age average (SD)	65
Sex, male	62
Diabetes mellitus	54
Hypertension	87
Dyslipidemia	89
Smoking	32
History of percutaneous coronary intervention	91
History of myocardial infraction	72
Prior coronary artery bypass graft (CABG)	30
Kidney disease	19

**Table 1:** Demographic features of the patients

ISR was carried out for all the patients and IRS was followed by DES in 75 of the participants. STEMI was reported in 3 individuals, stable angina was found in 22 patients and unstable angina was found in 38 participants as shown in table 2.

STEMI	3
NSTEMI	23
Stable angina	22
Unstable angina	38
Other	2
Graft disease	9
IRS, DES	75

**Table 2:** Signs for procedure

Mostly the vessel that was intervened was right coronary artery (RCA) in case of 31 patients. It was then followed by LAD and then Cx. SVG was also intervened in 9 patients. In 80 patients no. of vessels used was 1. In 10 patients there were 2 vessels used for 10 patients as shown in table 3.

List of data	No. of patients
<b>Lesion restenosis</b>	
<50%	3
50-70%	6
Greater than 70%	74

100%	8
<b>Intervention stage</b>	
Pre-treatment	2
Primary	78
Adjunct	6
Missing	3
<b>Target vessel</b>	
Cx n	19
LAD	24
RCA	31
SVG	9
LMS	5
<b>No. of vessel PCI</b>	
1 vessel	80
2 vessels	10
3 vessels	2
Bifurcation	12
Angiographic failure	3
Angiographic success	91
<b>No. of lesions (%)</b>	
1%	81
≥ 2 n (%)	11

**Table 3:** Data required for procedure

There were 91 patients that were discharged on ASA, 76 were discharged on clopidogrel and 14 patients were discharged on ticagrelor. The follow-up of almost 37 weeks was carried out for all the patients. Univariable and multivariable analysis was also carried out for MACE as shown in table 4.

Variable	Univariable		Multivariable	
	H.R. (95% CI)	p HR	H.R. (95% CI)	p HR
Age	1.055 (1.005,1.078)	0.0752	1.04 (1.55,1.012)	0.015
Balloon length (mm)	1.015 (0.563,1.095)	0.2635		
Sex, female	1.50	0.0567		
Vessel lesion	(0.962,4.763)	0.3451		
Cx reference	0.959 (0.387,2.798)			
LAD	2.880 (0.695,1.075)	0.0831		
LMS	1.0508	0.0312		
RCA	(0.769,8.6)	0.387		
SVG	2.95 (0.71,8.071)	0.128		
Hypertension	2.681 (0.312,18.91)	0.376		
Diabetes	1.11 (1.012, 0.128)	0.165		
Smoker	0.9 (0.405,1.88)	0.834		
Dyslipidemia	2.31 (0.05,3.078)	0.438		
Prior MI	2.155 (0.512,3.078)	0.659	2.131 (1.173,4.134)	0.0131
Prior CABG	2.41 (1.23,0.478)	0.0129		
Graft failure	0.813 (1.121,1.912)	0.723		
ISR-DES	1.61 (1.13,0.78)	0.356		
ISR-BMS	0.813 (1.175,1.882)	0.368		

**Table 4:** Univariable multivariable analysis for MACE

## DISCUSSION

This study was carried out to find the occurrence and predictors of the consequences found in the treatment of in-stent restenosis by making use of drug-eluting balloons. This is a real-life single center study that was carried out on 92 patients. The use of DEB in CAD along with the

significant follow-up was analyzed. In this study it was found that the clinical consequences in DEB for treating ISR are in accordance with the length of lesion and number of balloons used. The risk of DEBs was analyzed prior to this work in RIBSIV and other procedures. Although only one-year outcome was analyzed in this study which is not enough for DES, still it did well for mortality and the rate of MACE was found to be quite reasonable. As per our study the mortality rate came out to be high as compared to other studies carried out for one year. Our study showed results more comorbid with high ratio of patients with diabetes mellitus and previous history of myocardial infection. If we compare the demographic data of both RIBS DEB and DES arm to this study, the participants were of same age [11]. But as far as comorbidities are concerned there was high rate of diabetes, hypertension and dyslipidemia in our study. There was quite different presentation found in these patients, as most of them were presented with stable angina pain. And the rest of them showed symptoms of acute coronary syndrome. In our study it was found that there were 76% patients that were released on clopidogrel and 15% were discharged on ticagrelor. This study demonstrates that the use of long balloon or multiple balloons can't be used as a prognostic marker, and there is a link of MACE risk and ultimate death with age and past history of bypass surgery. The vessels intervened in previous studies were predominantly LAD, then it was followed by RCA and Cx [12, 13]. In our studies there was some contrast found in the vessel as the highest intervened vessel was RCA and then it was followed by LAD and LCX. As per some previous studies the five-year outcomes of DEBs in ISR vs DES were studied [14]. In a retrospective study the five-year comparison was done and the mortality rate came out to be 18% as compared to 21% in our study. There five-year MACE was 47% which is greater than that found in our study. The univariable and multivariable analysis was carried out by making use of hazard ratio (HR) which is similar to that used by previous studies [15, 16]. 95% confidence interval and a p-value less than 0.05 was kept for statistical analysis. As per some studies the link of MACE and death with the history of bypass surgery can help doctors decide what sort of cases of ISR should be given treatment through DEB so that death rate can be reduced [17]. The main findings of this study are that DEB angioplasty in ISR gives effective results even in a significantly comorbid population. Some of the features studied in this study were balloon's length and no. of vessels used. In case of multivariable analysis, the total length of the lesion was insignificant. However, it was observed that DEBs per vessel value was significant. This indicates that long length lesions that require the use of various DEBs are difficult to perform and can result in failure. This prognostic

marker can be studied more precisely for future studies [18]. This indicates that the use of multiple DEBs where only one can be used is not a favorable approach. Univariate analysis has shown that the main determinants in this study were age and the patient's history of CABG. Similar results were obtained on multivariate analysis as well. As per studies the use of (drug eluting balloons) DES is not an ideal solution especially in case of patients suffering from coronary artery disease [19-21]. There are certain limitations of this study, one limitation can be the retrospective design of study and the small sample size. As this study was retrospective so the part of selection bias can't be ignored. Secondly, due to the small sample size, it is difficult to comment on intervention of lesion.

## CONCLUSIONS

This single center study showed significantly low rate of TLR for a period of one year and moderate rate was found at five years. This study demonstrates that the use of drug-eluting balloon for in-stent restenosis (DES-ISR) treatment is safe and can be considered as effective treatment even in case of high comorbid population. This study also demonstrates that the factors like length of balloons and use of various balloons is not a prognostic marker. This study can help clinicians to make precise decisions to select which ISR patient can be treated with DEB.

## Conflicts of Interest

The authors declare no conflict of interest.

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Prevalence of Vertigo in Headphone Users of Call Center of Faisalabad city

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## ARTICLE INFO

## Key Words:

Vertigo, headphone users, calls centers

## How to Cite:

Fatima, R. e ., Bashir , I. ., Zahid, R. ., Bunyad, S. ., Arshad, F. ., Mehmood, B. ., & Kashif, M. . (2022). Prevalence of Vertigo in Headphone Users of Call Center of Faisalabad City: Prevalence of Vertigo in Headphone Users of Call Center. Pakistan Journal of Health Sciences, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.296>

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Received Date: 27th October, 2022

Acceptance Date: 12th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

In recent years, call center operations have become a global phenomenon. Call center operators reported headaches, tinnitus, and vertigo as the most common symptoms of wearing headphones for 7 to 9 hours daily. **Objectives:** To determine the association between vertigo in headphone users and in age, working hours and professional experience. **Methods:** This cross-sectional study was conducted to determine the prevalence of vertigo in headphone users in call centers of Faisalabad. This study followed pre-determined inclusion and exclusion criteria and the sample size of 450 participants were included in this study. SPSS 24 was used for data entry and analysis. **Results:** This study reported a significant association between working hours ( $p=.000$ ), years of work experience ( $p=.000$ ), and between age ( $p=.002$ ) and percentage of people with vertigo in VSS. **Conclusion:** It can be concluded that vertigo has association with age, working hours, years of work experience. While, vertigo has no association with gender, life style, residence and smoking habits.

## INTRODUCTION

Vertigo and lightheadedness are main indicators of disorders that disturbing the vestibular system. They can be persuaded by any of two prolonged or short-lived disorders, with impulsive reappearance, creating their clinical types inconstant [1]. Vertigo is stated as distorted insight of motion or imaginary rotation, is most widespread in elder population [2], associated to low physical health correlated standards of life [3], and a powerful factor to disability [4]. By the dysfunction of the balance system, either in the central nervous system or in the sensory parts (somatosensory, visual, vestibular). Multisensory vertigo is known as a vertigo that can be caused by the dysfunction of two of three sensory parts of the balance system [5]. Also,

the headphone use as factor external to the balance system, can caused vertigo. Geriatric syndrome is known as a multifactorial vertigo in the adult population [6]. But the vertigo including benign paroxysmal positional vertigo (BPPV) or vestibular impairment may also have single causes [7]. In Europe, the unit sale for most mobile phones and portable audio devices has increased today including an audio playback function. Portable electronic devices became a common and natural part of everyday life, such as tablets, smartphones and computers with headphones [8]. A sound system sends radio frequency to a matching set of wireless headphones to deliver melody other audio programming to a customer within the field of

transmission who is free to walk in any place. Wireless headphones receive alerting of arriving phone calls via telephone base component. The headphones might deliver an audio signal above or as an alternative of the audio programming to report the user of the arriving call. The headphones might as well integrate a microphone so that the consumer can collect the phone call with the earpieces [9]. The procedure of headphone has been supposed to produce aural sanitization complications and contamination in the ear canal. Not unusually the headphone consumer also precise alarm concerning the impending for this device to cause noise persuaded hearing loss. Conversely, recognized studies on the special effects of sustained routine of the headphone are infrequently defined in the literature. Amongst the sustained consumer of the earphone are telephones, radio deejays and mobile compact individual stereophonic [10]. Maximum call centers function as open office type settings in which employees (handset workers) carry on their duties mostly through consuming handsets to marketing goods, carry on investigations, deliver a facility and/or reply questions from callers. Handset workers in call centers mainly operate headphones to connect with customers as these permits them to organize further equipment corresponding entering records into CPU systems. Call centers characterize the speediest growing of any trade in the ecosphere with a predictable 220,000 handset ear set using employees (2.2% of the Australian staff) presently working in more than 4000 call centers through Australia. Rarely Call Centre telephone workers feel acoustic episodes for example an abrupt loud screech or high-pitched tone over their headphones. The telephone workers described feeling a 'startle effect' followed by dizziness, vertigo, feeling anxious, nausea and tingling at the left side of the face and tongue, headache and feeling anxious and teary. The audio signals can have special effects on handset workers, which are reflected to be directly associated to the level of anxiety in the worker. Consequences can variety from simple irritation to inability to carry on work, frequently for phases ranging among a limited hours to certainly not again capable to look after work including the usage of headphones [11]. The number of persons using headsets promptly increases, comprising those who were using headsets during the whole day in call center atmosphere, in the past twenty years. Respectively, the number of cases of trauma correlated with vulnerability to extreme noise produced by headphones and telephones has been increased [12]. This study was aimed to report the prevalence of vertigo among employee working at call centers who used headphone in the Faisalabad city and also find out the association of vertigo with demographic and working factors.

## METHODS

450 Participants from both the private and public call centers of Faisalabad were selected for this cross-sectional study on the basis of the availability of the signed consent form and fulfillment of the inclusion criteria by convenience sampling. Participants with ages 18-55, both males and females, must wear headphones for more than an hour and consent to participate in the study were included. Subjects to be selected from call centers of both public and private sector. The participant was excluded if they exhibit Tinnitus, psychiatric disorders or pregnancy. The Data Collection Tool for this study was Vertigo Symptom Scale. Vertigo symptom scale (VSS) tells us about frequency and severity of dizziness symptoms that occurred during the last 12 months and it consists of 36 items. Those patients who feels dizziness/vertigo can be find out through the VSS that was based on patient's interviews [13]. From the original scale a shortened version of the scale (VSS-SF) has been taken out, because it measures the symptom severity within the past month that's why it is introduced in the clinical trials [14]. 15 items are based on the VSS-SF. By adding the item scores symptom severity can be measured and each item is scored on 5-point scale (range 0-4). Higher score shows severe problems, as the total score is from 0-60. On the total scale if it shows  $\geq 12$  points it exhibits severe dizziness [15]. The scale is consisting of two further subscales: vertigo balance (VSS-V, scoring 0-32) as it consists of 8 items, and autonomic anxiety symptoms (VSS-A, scoring 0-32) as it consists of 7 items [9]. Satisfactory internal consistency and moderate test-retest reliability has been showed by the VSS-SF [16, 17]. Ethical approval of the study was taken from the Ethical & Research Review committee of Riphah International University. A questionnaire was given to each participant of the study. All the medical and scientific terms were explained clearly in a professional way, to the participants and they were requested to fill the questionnaire in front of us to avoid any false description of the parameters of the study or any deception. For the statistical processing or analysis of this data, Statistical package for social sciences (SPSS) 24.0 version was used. The frequency tables were used in order to calculate the trend of quantitative variables. To see the association between the main variables of the hypothesis p-value was interpreted accordingly.

## RESULTS

The aim of the research study was to find the prevalence of vertigo in headphone users of call centres. 450 participants were included, out of them, 394 were male and were 56 were female. Majority of the participants 218 (48.4%) were between the age of 24-29 and 374 were

belonged to urban area (Table 1).

Variables	Frequency (%)
<b>Gender</b>	
Male	394 (87.6%)
Female	56 (12.4%)
<b>Age (years)</b>	
19 or younger	23 (5.1%)
20-23	119 (26.4%)
24-29	218 (48.4%)
30-39	90 (19.8%)
<b>BMI</b>	
Underweight	16 (3.6%)
Normal	205 (45.6%)
Overweight	180 (40%)
Obese	49 (10.9%)
<b>Residence</b>	
Rural	76 (16.9%)
Urban	374 (83.1%)
<b>Smoking habit</b>	
Smoker	82 (18.2%)
Ex-smoker	24 (5.3%)
Non smoker	344 (76.4%)
<b>Lifestyle</b>	
Sedentary	328 (72.9%)
Active	122 (27.1%)
<b>Job title</b>	
RJ	192 (42.7%)
Rescuer	258 (57.3%)
<b>Work status in last 12 months</b>	
Full time	128 (28.4%)
Part time	322 (71.6%)
<b>Work setting</b>	
FM station	192 (42.7%)
Rescue 1122	258 (57.3%)
<b>Working hours</b>	
5	192 (42.7%)
More than 5	258 (57.3%)
<b>Years of work experience</b>	
5	281 (62.4%)
5 to 10	154 (34.2%)
More than 10	15 (3.3%)
<b>No of off days due to vertigo issues</b>	
1day	11 (2.4%)
2days	7 (1.6%)
No	432 (96%)
Total	450 (100%)

**Table 1:** Frequency distribution of demographic information

The finding of this study reported that there was significant association of years of work experience (p=0.002) and working hours (p=.000), with individual with vertigo in VSS. (Table 2 & 3).

Vertigo	Working Hours					p- value
	2	3	4	6	12	
Never	7(14.6%)	10(20.8%)	2(4.2%)	15(31.2%)	14(29.2%)	.000
A few (1-3-time year)	13(61.9%)	4(19.0%)	4(19.0%)	0(0.0%)	0(0.0%)	
several times (4-12-time year)	16(14.2%)	27(23.9%)	10(8.8%)	26(23.0%)	34(30.1%)	
Quite Often (More than once a month)	40(14.9%)	42(15.7%)	17(6.3%)	89(33.2%)	80(29.9%)	
Total	76(16.9%)	83(18.4%)	33(7.3%)	130(28.9%)	128(28.4%)	

**Table 2:** Association between Working Hours and Percentage of People with Vertigo in VSS

Vertigo	Working Hours												p- value
	1	2	3	4	5	6	7	8	9	10	11	12	
Never	3 (6.2%)	6 (12.5%)	9 (18.8%)	4 (8.3%)	6 (12.5%)	14 (29.2%)	0	3 (6.2%)	2 (4.2%)	0	1 (2.1%)	0	0.002
A few (1-3-time year)	5 (23.8%)	7 (33.3%)	7 (33.3%)	1 (4.8%)	0	0	0	1 (4.8%)	0	0	0	0	
several times (4-12-time year)	10 (8.8%)	22 (19.5%)	10 (8.8%)	18 (15.9%)	10 (8.8%)	13 (11.5%)	7 (6.2%)	8 (7.1%)	3 (2.7%)	5 (4.4%)	4 (3.5%)	3 (2.7%)	
Quite Often (More than once a month)	17 (6.3%)	32 (1.9%)	49 (18.3%)	43 (16%)	22 (8.2%)	35 (13.1%)	16 (6%)	17 (6.3%)	17 (6.3%)	13 (4.9%)	1 (0.4%)	6 (2.2%)	
Total	35 (7.8%)	67 (14.9%)	75 (16.7%)	66 (14.7%)	38 (8.4%)	62 (13.8%)	23 (5.1%)	29 (6.4%)	22 (4.9%)	18 (4%)	6 (1.3%)	9 (2%)	

**Table 3:** Association between Years of Work Experience and Percentage of People with Vertigo in VSS

Moreover, there is significant association between age and individual with vertigo. Age group of 20-23 and 24-29 shows more symptoms as (p=0.002). (Table 4)

Vertigo	Working Hours					p- value
	19 or younger	20-23	24-29	30-39	40-55	
Never	1(2.1%)	17(35.4%)	24(50.0%)	6(12.5%)	0(0.0%)	0.002
A few (1-3-time year)	4(19.0%)	12(57.1%)	5(23.8%)	0(0.0%)	0(0.0%)	
several times (4-12-time year)	7(6.2%)	31(27.4%)	49(43.4%)	26(23.0%)	0(0.0%)	
Quite Often (More than once a month)	11(4.1%)	59(22.0%)	140(52.2%)	57(21.3%)	1(0.4%)	
Total	23(5.1%)	119(26.4%)	218(48.4%)	89(19.8%)	1(0.2%)	

**Table 4:** Association between Age and Percentage of People with Vertigo in VSS

## DISCUSSION

Our study concluded that out of 450 subjects 402 subjects show vertigo in vertigo symptom scale. A study was conducted in Germany on the prevalence of vertigo supported our study which shows a generally demonstrative section of 4869 mature persons was examined for moderate or severe vertigo, following the clear analytical measures 1003 persons with vertigo experienced authorized neurologic dialogues to discriminate vestibular vertigo from non-vestibular vertigo. Vertigo had an occurrence (first incident of vertigo) of 3.1% and had an incidence of 22.9% in the previous 12 months. The incidence for vestibular vertigo was 1.4% and the prevalence was 4.8%. A curative discussion since of

episode vertigo was described by 1.8% of unselected mature persons who referred a medical doctor in the previous 12 months for occurrence vertigo (0.9% for vestibular vertigo)[18]. A study conducted by Mizukoshi et al., on the prevalence of BPPV in Japan expected the prevalence to exist 10.7 to 17.3 per 100 000 per year, since maximum cases of BPPV resolve impulsively within months though it is expected to be miscalculate [19]. A study from Japan described a prevalence of BPPV was 0.01%, however it can be considered as miscalculation as merely patients came throughout the acute stage to medical doctor associated with the investigation commission were involved [19]. An additional study from Olmsted County, Minnesota predicted the prevalence of BPPV was 0.06% on the base of a residents established medical proceedings association system. Though, patients not looking for medicinal assistance were not involved and therefore this research does not seem to be demonstrative of the overall peoples [20]. In Germany a Cross-sectional study was conducted which generally illustrative neurological examination of overall mature inhabitants with a two-phase selection proposal examination of 4869 members from the German National Telephone Health Interview Survey 2003 (reaction ratio 52%) for severe and moderate vertigo, proceeding by authorized neurological conversations (n = 1003; reaction ratio 87%). Investigative measures for BPPV were not less than five outbreaks of vestibular vertigo lasting, 1 min deprived of associated neurological signs and consistently triggered by usual variations in head placement. In a concurrent validation study (n=61) conducted in two specialised dizziness clinics, BPPV was perceived via our handset conversation with a compassion of 88% (positive analytical rate 88%, negative analytical rate 92%) and a specificity of 92%. BPPV considered for 8% of subjects with severe or moderate vertigo. The 1-year incidence of vertigo was 1.6%, the lifespan incidence of BPPV was 2.4% and the 1-year prevalence was 0.6%. 2 weeks was the average interval of an incident. BPPV bring about to medicinal discussion, disruption of everyday accomplishments or sickening vacation in 86% of stimulated persons. Over-all, only 8% of provoked members provided constructive therapy [21]. In 2001 a prospective study was carried out in the duration of 12-month. Documents were gained from the Second Dutch National Survey of General Practice. An exploration approach containing of 15 abbreviated exploration expressions (constructed on Dutch substitutes for vertigo), and recognized all subjects matured 65 or elder who go to their intimate medical doctor for vertigo (N = 3,990). In personal training in subject's elderly 65 or adult the one-year incidence of vertigo was 8.3%, it was greater in females rather than in males, and it becomes greater with

time of life. In subject's elderly 85 or adult the incidence was parallel for males and females. The prevalence of vertigo was 47.1 per 1000 individuals-years. The personal medical doctor did not identify a conclusion, and documented a warning sign identification as the absolute judgment for 39% of the lightheaded subjects[22].

## CONCLUSIONS

This study concluded that vertigo has association with age, working hours, years of work experience. While, vertigo has no association with gender, life style, residence and smoking habits. Further advance studies must be directed so that appropriate actions could be engaged to avoid and treat this public health and work-related problem.

## Conflict of interest

The authors declare no conflict of interest

## Source of Funding

The authors received no financial support for this research article

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## Original Article

## Primary Trans-anal Endorectal Pull Through for The Management of Hirschsprung Disease: Our Experience of 20 Cases

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## ARTICLE INFO

**Key Words:**

Hirschsprung's Disease, Aganglionic Colon, Anastomotic Stricture, Transient Fecal Incontinence

**How to Cite:**

Haider, N. H., Sulman Butt, M. ., Varda, K. ., Shahbaz, F. ., Ajaz, M. ., Saeed, A. ., & Saleem, J. . (2022). Primary Trans-anal Endorectal Pull Through for The Management of Hirschsprung Disease: Our Experience of 20 Cases: Primary Trans-anal Endorectal Pull Through for Hirschsprung Disease. *Pakistan Journal of Health Sciences*, 3(06). <https://doi.org/10.54393/pjhs.v3i06.332>

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Received Date: 7<sup>th</sup> November, 2022

Acceptance Date: 17<sup>th</sup> November, 2022

Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

Hirschsprung's disease can be defined in terms of the aganglionic part of the colon and the definitive treatment is a one-stage trans-anal endorectal pull-through surgery. **Objectives:** To find out the efficacy and safety of this one-stage pull-through. Mostly the surgery is done in early childhood or the neonatal period, as the case is less frequently reported in older children and adolescents. **Methods:** A retrospective study was conducted including 16 males and 4 females. 20 cases including children of 6 months to 14 years, all were diagnosed with Hirschsprung's disease in the study duration of two years. The diagnostic criteria of these patients included; Clinical history of delayed passage of meconium, contrast enema, and rectal biopsy. Definitive variables were; Age, sex, and length of the aganglionic part of the colon. **Results:** All the patients included in the study had distended abdomens and persistent constipation. All of them have an aganglionic colon, a diagnosing feature of Hirschsprung's disease. All patients underwent the trans-anal endorectal one-stage pull-through. The average operative time recorded was 150 minutes. Post-operative complications were also recorded including anastomosis leakage (only in one case; for that a diversion colostomy was done), anastomotic stenosis or stricture (not reported in any case), enterocolitis and perineum irritation (In four cases), Transient fecal incontinence is a major complication (11 cases had transient fecal incontinence which resolved spontaneously with 1 to 2 weeks). No death had been recorded. **Conclusion:** For the treatment of Hirschsprung's disease, primary trans-anal endorectal pull-through is a safe and efficient technique.

## INTRODUCTION

Hirschsprung disease is mostly diagnosed in neonatal life. At a later age in older children, abdominal distension and chronic constipation were reported [1]. The principle of this surgical technique is the resection of an aganglionic part of the rectum followed by a pull-through of the ganglionic bowel down the anus [2]. This technique is frequently practiced in neonates and infants. There are fewer research and literature reports about this technique. Mostly the patients had well-defined zones of the ganglionic and aganglionic colon [3]. Patients who were

undergone colostomies had their treatments by traditional multistage conventional pull-through [4]. Development of new surgical techniques and minimally invasive surgeries for complex diseases like Hirschsprung's disease developed, and the primary endorectal transanal pull-through is one of the latest techniques. Conventionally transanal mucosectomy was common [5]. Although this disease is very common in low or middle-income countries. But the complex and detailed reports are available on a small sample size to evaluate the effectiveness and

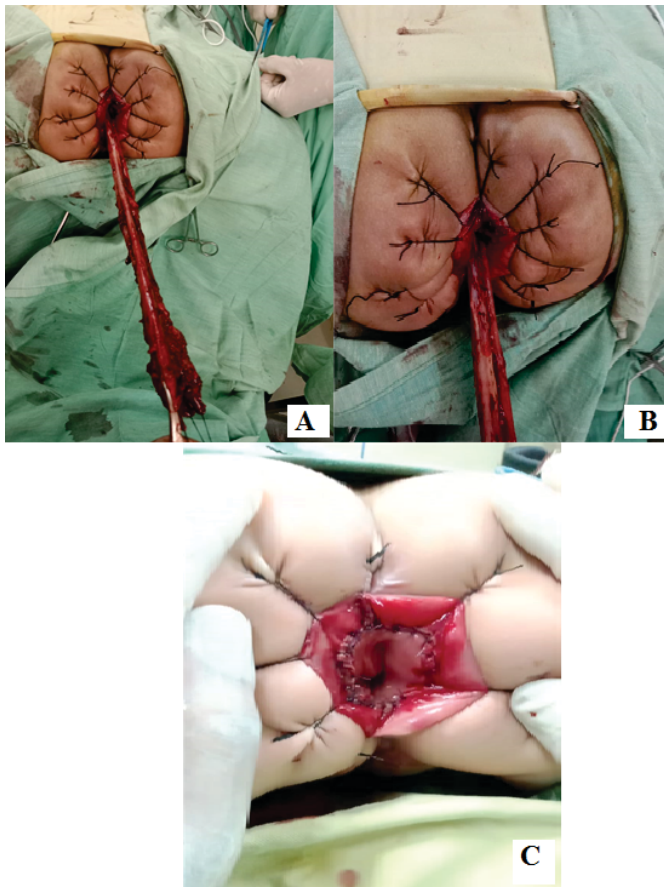
proficiencies in detail. The one-stage endorectal pull is definitely more supportive in pediatric age of patients with good and fast recovery times than the conventional endorectal pull-through surgeries [6]. Primary trans-anal endorectal pull-through is the most successful technique in pediatric surgery. Many studies support this surgical technique due to its feasibility less operative time and less blood loss without any abdominal incision [7]. Post-operative complications were significantly low also the list of benefits includes fast recovery, early discharge, and cost-effectiveness. Multiple studies support this technique because of less occurrence of intraperitoneal bleeding [8]. This technique was uncommon in pediatric surgery, but recent studies support this technique more in infants at early diagnosis than in older children [9]. The chronic accumulation of feces in the colon leads to inflammation and makes this primary pull technique less effective. Inflammation in the colon leads to ulcerations which can harm the mucosa and sub-mucosa and chances of fibrosis and enterocolitis increase. The congenital abnormalities are needed to be diagnosed and treated at a very early age otherwise lead to difficulties in treatment. The primary trans-anal endorectal pull in infants required less operative time, low occurrence of bleeding on average, and fast recovery. The surgery in older children displayed with very dilated colon, the mesentery vessels are large and there are more chances of bleeding and enterocoagulations [10]. More stitches and prolonged surgery distress surgeons and patients' health as well. That's why surgery in older children over 2 years of age required pre-operative bowel preparations with anema to empty the stool from the colon so the extra dilation of the colon could be reduced. On average the operative time in older children is twice of infants [11]. Primary endorectal pull-through is a more supportive technique to prevent post-operative complications including colo-anal anastomosis and anastomosis leakage. The severity of this complication is very high, and it's the most severe early operative complication in colostomies [12]. The most common technical problem leading to anastomosis leakage is inadequate bowl preparations and tension in anastomosis which can also be a cause of inadequate stricter placements in correspondence to the nominal diameters [13]. An abdominal CT scan is the most common technique in the diagnosis of anastomosis leakage in an early phase. If the patient gets this complication, reoperation is done [14].

## METHODS

From august 2020 to august 2022, 20 cases of diagnosed Hirschsprung disease, including children of 6 months to 14 years. 16 males and 4 females were included. The data and

medical records were recorded retrospectively. The variables under consideration included demographic features; age, gender, clinical presentation, level of aganglionosis, pathology reports complications, and outcome variables. A questionnaire was used to collect the following information. Demographic variables include age, and sex at the time of diagnosis. Diagnostic investigations, preoperative information. Operative details of the surgical procedure include; the orientation of the patient, the point at which submucosal dissection was done, colon mobilization and degree of movement of the colon, the size of the remaining colon, colon length being excised, estimated blood loss, and operative time. Post-operative details include; the time of recovery regaining peristalsis, time to start the oral feed, and passage of the first stool. Post-operative complications were also recorded including anastomotic leakage, anastomotic stenosis or stricture, enterocolitis, and perineum irritation, Transient fecal incontinence was a major complication. Preoperative bowel preparation was done in all patients; rectal irrigation with normal saline solution 20cc / kg two times a day, and digital rectal stimulations. Preoperative antibiotic prophylaxis was induced by amoxicillin and clavulanic acid. After the induction of general anesthesia, patients were adjusted to the operative table. eversion and entrance of the anus were permitted by stay sutures with an anocutaneous junction. The surgeon preferred the jackknife position to directly assess mesenteric vessels to expose the anal canal and retracted with stay sutures. Stay sutures were inserted in the circumferential row above the dentate line approximately 0.5 to 1cm. The incision was done on the rectal mucosa with distal orientation to traction sutures, the mucosa is circumferentially lifted with the help of a diathermy needle and the submucosal plane is developed. Once this plane was built, the dissections get easy to continue towards blunt dissection and infiltrating vessels were cauterized of the submucosa. proximal extension of mucosal tube traction facilitates the dissection till the peritoneal reflection level is achieved (10 to 15cm on average over the dentate line). The upper end of this muscular cuff was controlled by four stay sutures are used and the full thickness of the sigmoid colon is exposed. The dissection was done on the outer wall of the rectal muscle and Pulled through a segment of the rectum and sigmoid colon as shown in figure 1A. above the level of peritoneal reflection, the dissection is extended. The incision was done circumferentially on the rectal muscle. An intraoperative frozen section is performed when a transitional zone is exposed as shown in figure 1B. A piece of colon was resected and the sample was sent to the pathology department for a frozen section. Histological examination and confirmation of the transitional zone of

the colon were marked and mobilization is done at that point by dividing rectosigmoid vessels and cauterizing them. In the case of neonates, ligatures were not needed. Inversion of the long seromuscular cuff was done, and shortened to at least 5cm before returning it to the normal position outside the anus. Resection was done to the part of an aganglionic segment, at the dentate line and proximally a dissection was carried out on the submucosa. This defines the boundary of the ganglionic colon and at that point, resection was done using absorbable sutures. Coloanal anastomosis is done as shown in figure 1C. Normally the innervated bowel was pulled and anastomosed at the point of the remaining mucosal region above the dentate line using 4-0 absorbable sutures. Patients were allowed to feed the very next day of the procedure. Anal dilation was done in a routine follow-up in all neonates and children once or twice for up to three weeks. Follow-up sessions were organized once a week followed by once a month than up to 3 months afterward.



**Figure 1:** (A) Describes the Pulled through segment of rectum and sigmoid colon. (B) Shows Site of frozen section biopsy and (C) Explains anastomosis of ganglionic colon above dentate line

## RESULTS

As a mean calculation of operative time was 150 minutes (90 to 180 minutes range). Statistically, significant time was

more in older patients than in neonates (120 90 v 80 40 minutes; p-value 0.05) in comparison to infants, the submucosal dissection was more difficult in older patients this refers to the thickness of their mesentery, long-standing dilated and also due to hypersigmoid colon. On average the length of resected bowel was 25cm to 12.5cm with a range of (15 to 45cm). Intraoperative time and blood loss were the main features, the average blood loss was 10 to 50 ml (on average 30 ml, 14% of total blood volume). The blood transfusion was not done in any case. The conversion rate was not found significant in all the cases. Average operative time and difficulties in operative procedure and post-operative complications all were recorded more in older patients than in neonates as described in table 1.

Indices	Ranges	Average Value/ Mean/ Ratio
The Average Age of Patients At Operation	6 months to 14 years	3 years
Sex Of Patients	16 boys (80 %) and 4 girls (20 %).	4:1
Average Length Of Resected Bowel	15 to 45cm	25cm
Blood Loss During Operation	10 to 50 ml	30 ml
Operative Time	90 to 180 minutes range	110 minutes
Hospital Stay	4 to 7 days	5 days

**Table 1:** Patients indices with Hirschsprung's Disease

Table 2 describes the Post-operative complications summarized in the table below, were also recorded including anastomosis leakage (only in one case; for that a diversion colostomy was done), anastomotic stenosis or stricture (not reported in any case), enterocolitis, and perineum irritation (In four cases), Transient fecal incontinence is a major complication (11 cases had transient fecal incontinence which resolved spontaneously with 1 to 2 weeks). No death had been recorded.

Postoperative Complications	No of Cases	Frequencies
Anastomosis Leakage	1 case	0.05%
Anastomotic Stenosis	No case reported	
Enterocolitis and Perineum Irritation	4 cases	0.2%
Transient Fecal Incontinence	11 cases	0.55%
Death	No case reported	

**Table 2:** Occurrence of post-operative complications

## DISCUSSION

Hirschsprung's Disease is best treated via save and primary transanal endorectal pull-through. Sometimes the endorectal pull-through is followed by laparotomy [2]. Laparotomy should not be considered a failure for the primary surgical technique the target is to dissect the aganglionic part of the colon which should be done for the complete treatment of the disease not just to avoid the laparotomy the aganglionic part can be left undissected after surgery [15]. The complications which are more



common in older children than in infants, rare cases of infants who have sensitive skin and have more chances of perineum irritation [16]. On the other hand, Holschneider et al., found that if we discuss enterocolitis was more common in children at the infant age than in children above 2 years the reason is the immature of the underdeveloped enteric nervous system. Anal incontinence is a less frequent complication studied via the literature of pediatric surgery with a frequency of 1 to 10% in variant cases [16, 17]. Kim et al., literature also provided evidence about other complications, like soiling, the incidence of soiling was found to be 13% in many studies. Kim et al., study showed that soiling was 13% in neonates and 20% in children above two years of age [18]. We can conclude that soiling is more in older children than in neonates. This phenomenon finds its explanation more in the dilation of the colon and the size of the aganglionic area. The management is done via behavioral and cognitive therapies and the follow-up of patients. Constipation is considered among post-operative complications. With an occurrence rate of 10%. Not common among children with Hirschsprung's disease [19]. There are many studies found to provide a comparison of these surgical techniques. The traditional pull-through procedures and primary trans-anal endorectal pull-through surgery. The studies provide comparisons in feasibilities, safety, operative time, and post-operative complications [4]. Limitations are also under consideration for the one-stage technique when the aganglionic segment of the sigmoid colon is pulled through the endorectal. The lower one-third of the descending colon is pulled out of the anus because it is loosely attached to the peritoneum [5]. A histopathology frozen section is the evidence for the sigmoid colon. Pratap et al., studied that there were cases with laparotomy, firstly they start the procedure transanally then switch to laparotomy if the histologically provide frozen section is not reached from the below [20]. Rare cases of total colonic aganglionosis are also treated with the same procedure endorectal pull then conversion towards the laparotomy after completing the trans-anal mucosectomy. Marty et al., provided evidence for the best supportive and surgical procedures with respect to the surgical position of the patients, the most recommended position is the supine position than the prone position. The effect of controlling the mesenteric vessels is the main concern [21]. The significant stretching of the anal sphincter and an initial step for the primary transanal endorectal pull-through during mucosectomy. This procedure may lead an impact on postoperative continence status. This impact is more common in older children than in infants who have marked hypertrophy and dilation of the colon [22]. Wester et al., studied that patients undergoing conventional endorectal

pull-through surgeries have a low occurrence of postoperative constipation because of constant and low anastomosis [23]. But if we compare the conventional endorectal approach with the recent studies definitely the primary endorectal pull-through technique is the most efficient surgical technique in pediatric surgery. With less incidence of complications [24]. Early postoperative feeding, shorter hospital stay, less scaring, low bleeding during the surgery, and also cost-effective. The technique was easy to learn for practicing surgeons and considered the best treatment for the treatment of Hirschsprung's disease. Many studies support the evidence that primary transanal endorectal pull-through has been set the gold standard treatment for the treatment of Hirschsprung's disease [25].

## CONCLUSIONS

In infants and children with Hirschsprung's disease, the surgical treatment of primary endorectal pull-through technique is the most efficient technique with less occurrence of morbidities and mortalities.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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978-3-540-33935-9\\_29](https://doi.org/10.1007/978-3-540-33935-9_29)



## Original Article

## Sustained Virological Response (SVR) and Safety of Two Direct Acting Anti-Viral (DAA) Combination Therapies in Chronic Hepatitis-C Infected Patients of Lahore, Pakistan. A Randomized Controlled Trial

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## ARTICLE INFO

## Key Words:

Chronic HCV, Direct Acting Anti-Virals (DAA), Sustained Virological Response(SVR), Sofobuvir

## How to Cite:

Kazmi, S. ., Farooqi, H. ., Sohail, U. ., Haider Zaidi, S. ., Majeed, N., & Firdous, S. . (2022). Sustained virological response (SVR) and safety of two direct acting anti-viral (DAA) combination therapies in Chronic Hepatitis-C infected patients of Lahore, Pakistan. A Randomized Controlled Trial: SVR and DAA Therapies in Hepatitis-C Infected Patients. Pakistan Journal of Health Sciences, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.294>

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## ABSTRACT

Chronic Hepatitis C(HCV) is a deadly infection affecting >185 million people worldwide and led to liver cirrhosis, hepatocellular carcinoma, or liver failure. Recently, treatment regimens of chronic HCV have entered the era of direct acting anti-virals (DAAs). Sustained virological response (SVR) rate is one of the best available tools to evaluate the efficacy of DAA treatments.

**Objective:** To compare SVR rate and safety of two combinations of DAA treatments (Sofosbuvir and Daclatasvir vs Sofosbuvir and Velpatasvir) in chronic HCV infected patients of Lahore, Pakistan. **Methods:** Present randomized controlled trial was conducted at Mayo Hospital, Lahore, Pakistan and recruited 76 chronic HCV infected patients according to Consort guidelines. Registered patients were allocated in two groups by lottery method. Group A received sofosbuvir with daclatasvir (SOFO + DCV) while group B received sofosbuvir with velpatasvir (SOFO + VEL) treatment for 12 weeks. Response to therapy was evaluated in terms of SVR after 24 weeks and safety profile of the drug. **Results:** Both treatment groups showed high SVR 24 weeks after the completion of therapy. Group A (SOFO + DCV) presented 92% SVR while group B showed 97% SVR rate. Both DAA combination therapies presented good efficacy and safety profile. Few contraindications noted during the treatment included fatigue, arthritis, headache, loss of appetite and anemia. **Conclusions:** The efficacy of both DAA combination therapies was comparably high with >90% SVR rate. Group A proved safer as compared to group B. Studied DAA combinations are effective treatment options for chronic HCV treatment planning.

## INTRODUCTION

Hepatitis C infection is the leading cause of death in the United States, affecting more than 185 million people representing 2.8% global estimated prevalence. More than 60% of worldwide estimated cases belonged to Asia with 71.9 million active HCV replication cases [1, 2]. Chronic hepatitis C infection frequently leads to the development of liver cirrhosis, hepatocellular carcinoma, liver failure or death. HIV positive patients experience even worse

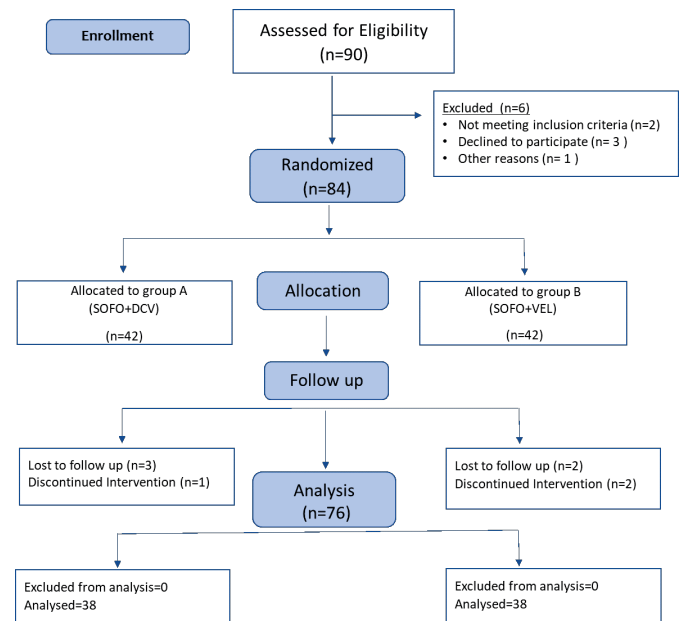
condition during anti-retroviral therapy [3]. Since 2014, treatment of chronic hepatitis C infection has entered in the new regime by introduction of highly effective direct acting anti-virals (DAAs) which have shown complete cure in more than 90% patients. DAAs treatment includes 1-3 tablets per day for 8-12 weeks. Very few studies reported the side effects associated with the treatment. Pakistan has been ranked as second highly prevalent HCV

infected country and is among the list of low/middle-income countries cannot afford the highly expensive DAAs treatments at high level. Therefore, generic versions of DAA combination therapy are available in Pakistan to treat the highly transmissible disease. Sustained virological response (SVR) is one of the best available tools to evaluate the effectiveness of any anti-viral treatment of HCV infection. SVR is defined as "an absence of detectable HCV RNA in the serum with use of an assay having a sensitivity of at least 50 IU/ml 12-24 weeks after therapy is complete". It measures the extent to which any treatment can clear the viral infection and what proportion of infected people achieve SVR. It varies from 80-90% using different combinations of direct anti-viral agents (DAA) with pegylated interferons (pegIFN) and ribavirin [4-7]. Combination of two DAAs have shown the SVR rate of up to 99% (8, 9). SVR has been reported as robust and clinically meaningful therapeutic endpoint to evaluate the success of any anti-viral therapy (10). Clinical research in chronic Hepatitis C treatment regimens is now advancing rapidly and reported studies used SVR 12 as well as 24 weeks post treatment as primary endpoint indicator of the therapy. However, Phase III clinical trials of boceprevir and telaprevir have used SVR 24 weeks post treatment as primary indicator of the endpoint [11, 12]. Another study conducted by FDA assessed the concordance of SVR12 and SVR24 by combining data from fifteen clinical trials (n=12,000) and results revealed 98% patients with SVR 12 also had SVR 24; thus proving the efficacy of SVR12 equally well with SVR24 [13]. Improved SVR rates can therefore lead to decrease the currently excessive prevalence and transmission rates of HCV. There are 9 different variants of HCV and most of the DAAs were designed against genotype 1 which raise questions about the efficacy of these treatments on other genotypes. Till now very limited data is available on assessment of SVR 12 in different combinations of sofosbuvir (SOF) with daclatasvir (DCV) or valpatasvir (VEL) in most frequent genotypes of Pakistan. The objective of the present study was to compare the SVR in a group taking sofosbuvir and daclatasvir combination with second group taking sofosbuvir and valpatasvir in chronic HCV patients of Lahore, Pakistan. The results of the study will help medical professionals and general physicians to prioritize the line of management based on sound knowledge in this dynamic era of HCV treatment and finally, to manage the patients who are suffering from disease. Clinician will also be able to delineate the satisfactory treatment outcome of therapy that will help to reduce the concerns of the patient and his family.

## METHODS

This randomized controlled trial was approved by institutional review board of King Edward medical

university, Lahore after considering the safety and efficacy of the drugs and was carried out according to the ethical guidelines involving human subjects. Chronic HCV infected patients visiting the gastroenterology outdoor department of Mayo Hospital, Lahore were recruited in the study after taking written informed consent. Convenient sampling technique was used for sample collection. Chronic HCV patients of both genders with 18-60 years' age, history of positive anti-HCV antibodies followed by positive HCV RNA by qualitative test were included in the study. Patients with liver cirrhosis, co-infection, diabetes mellitus, CKD, NAFLD/NASH, drug addiction or liver transplant plan, serious illness or consent refusal were excluded from the study. Patients with contraindications to therapy like severe anemia, malabsorption, ischemic heart disease, arrhythmias, jaundice, pregnancy, lactation, infertility, malignancy, severe depression, and psychosis were also excluded. The details of selection of study subjects following the consort guidelines are given in Figure 1.



**Figure 1:** Consort for selection of study subjects

Enrolled patients were allocated in two equal groups by lottery method (computer generated technique). Group A received sofosbuvir (400mg) and daclatasvir (60mg) (SOF + DCV) treatment while group B received sofosbuvir (400mg) and velpatasvir (100mg) (SOF + VEL) treatment for 12 weeks. SVR was measured 24 weeks after completion of treatment (HCV RNA < 100 copies per ml). Drug side effects of both groups were noted on follow up visits based on history and clinical examination. Data were recorded into Microsoft Excel and statistical analysis was carried out using SPSS version 21.0 (IBM Corp., Armonk, USA). Normally distributed quantitative data were presented as mean  $\pm$  standard deviation (S.D.), and non-normally distributed

data was represented as median. In cases where the association between two qualitative parameters was evaluated, data was presented as proportions and the Chi-squared test used. A p-value ≤ 0.05 was considered statistically significant

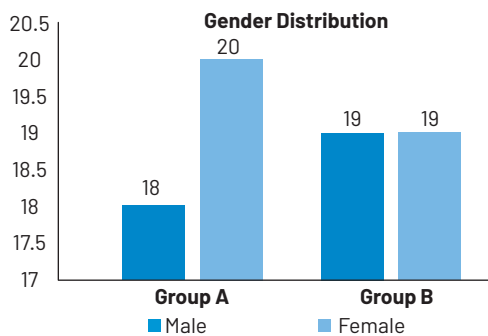
## RESULTS

This randomized controlled trial initially enrolled 90 chronic HCV patients visiting Gastroenterology outdoor of Mayo Hospital, Lahore, Pakistan after taking written informed consent from each patient. Selection of study subjects was carried out by using standard consort guidelines. Briefly, 84 chronic HCV infected patients were selected after applying the inclusion criteria. Selected 84 patients were randomized by lottery method in two equal groups as group A (n=42) received sofosbuvir and daclatasvir and group B (n=42) received sofosbuvir and velpatasvir anti-viral treatment for 12 weeks. 4 patients in each group discontinued intervention or failed to follow up therefore excluded from final analysis. Both study groups thus included 38 study subjects each and were treated in the same hospital setting for 12 weeks. Demographics of study subjects are given in the table 1.

Characteristics	No.
Subjects Enrolled	76
Mean Age ± SD	42 ± 10
Group A (Sof + Dcv)	38
Group B (Sof + Vel)	38
Average Viral Load Before Intervention	127 8483

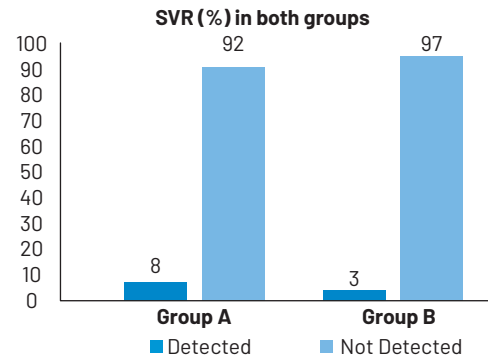
**Table 1:** Demographic characteristics of study subjects

Gender distribution of enrolled patients is given in Figure 2. 24 weeks after the completion of therapy SVR was noted for both groups to check the efficacy of both treatments.



**Figure 2:** Gender distribution in both intervention groups

Interestingly, both groups showed good SVR as measurable amount of viral RNA was detected only in 8% patients (3/38) of group A and 3% patients (1/38) of group B representing 92% and 97% SVR respectively in both groups (Figure 3). There was no statistically significant difference in the treatment efficacy of both groups (p=0.307).



**Figure 3:** SVR (%) in group A (92%) and group B (97%)

Side effects were compared among both treatment groups. Fatigue was most common side effect present in 60.5% patients in Group A and 65.8% in Group B (p=.634). Arthritis was present in 52.6% in Group A and 55.3% in Group B (p=.818). Alopecia was present in 5.3% in Group A and 44.7% in Group B and was statistically significant (p=.040). Loss of appetite was present in 29.8% in Group A and 55.3% in Group B and was statistically significant (p=.040).

Side Effects	Group A (Sof + Dac)		Group B (Sof + Vel)		p-value
	No	Yes	No	Yes	
	N(%)	N(%)	N(%)	Frequency	
Fatigue/Weakness	15(39.5%)	23(60.5%)	13(34.2%)	25(65.8%)	.634
Headache	22(57.9%)	16(42.1%)	23(60.5%)	15(39.5%)	.815
Insomnia	35(92.1%)	7.9%)	27(71.1%)	11(28.9%)	.018
Dementia	38(100.0%)	0(0.0%)	38(100.0%)	0(0.0%)	*-
Fever	36(94.7%)	2(5.3%)	32(84.2%)	6(15.8%)	.135
Nausea	26(68.4%)	12(31.6%)	19(50.0%)	19(50.0%)	.102
Vomiting	37(97.4%)	1(2.6%)	36(94.7%)	2(5.3%)	.558
Diarrhea	38(100.0%)	0(0.0%)	34(89.5%)	4(10.5%)	.040
Alopecia	36(94.7%)	2(5.3%)	21(55.3%)	17(44.7%)	.000
Skin Rash	35(92.1%)	3(7.9%)	34(89.5%)	4(10.5%)	.692
Oral Ulcer	38(100.0%)	0(0.0%)	37(97.4%)	1(2.6%)	.314
Arthritis	18(47.4%)	20(52.6%)	17(44.7%)	21(55.3%)	.818
Dyspnea	34(89.5%)	4(10.5%)	36(94.7%)	2(5.3%)	.395
Cough	37(97.4%)	1(2.6%)	37(97.4%)	1(2.6%)	1.000
Loss of Appetite	27(71.1%)	11(28.9%)	17(44.7%)	21(55.3%)	.020
Anemia	31(81.6%)	7(18.4%)	26(68.4%)	12(31.6%)	.185
Neutropenia	38(100.0%)	0(0.0%)	36(94.7%)	2(5.3%)	.152
Thrombocytopenia	38(100.0%)	0(0.0%)	35(92.1%)	3(7.9%)	.077

\*= Cannot be computed variable is static

**Table 2:** Comparison of side effects in both treatment groups

## DISCUSSION

Therapeutics of chronic HCV infection has entered the next era of DAAs which have achieved higher SVR rates as compared to interferon therapy in no time. Spengler found that DAAs had shown potential to restrain the development of liver cirrhosis in chronic HCV infected patients. Therefore, modern treatment of HCV is now shifting towards the DAAs around the globe [14]. Hill et al., found that DAAs were costly but the availability of generics in developing countries has revolutionized the therapy but require careful analysis of side effects and efficacy [15].

The European association for study of liver (EASL) has recommended the addition of ribavirin with Sofobuvir and daclatasvir or sofoobuvir and velpatasvir combination therapy depending upon the presence or absence of liver cirrhosis in the patients [16]. Likewise, Chung et al., recommended the addition of ribavirin in patients with cirrhosis along with Sofobuvir and daclatasvir or sofoobuvir and velpatasvir treatment [17]. This study was conducted to compare the efficacy, SVR and side effects of two combinations of DAAs. Study subjects (n=76) were randomized in two equal groups as group A received sofoobuvir & daclatasvir treatment whereas group B received sofoobuvir and velpatasvir treatment for 12 weeks. All patients were treated in the same hospital setting and were followed up 24 weeks after the completion of therapy for assessment of SVR24 and careful analysis of side effects. Study results report the good SVR rates in both groups as in group A only 3 patients (8%) were detected with viral RNA after 24 weeks of therapy representing the 92% SVR rate. Whereas in group B only 1 patient (3%) detected viral RNA representing the 97% SVR rate. Our results are in concordance with previously published data where combination of sofoobuvir and velpatasvir was shown to achieve the higher SVR in clinical trials [18]. Belperio et al., reported the comparable results of sofoobuvir with daclatasvir and sofoobuvir with velpatasvir therapy in HCV genotype. Omar et al., study reported the data from different geographical locations with different ethnicities [19, 20]. Present study carefully analyzed the SVR, and side effects caused by the therapy in both groups and found fatigue/weakness as most frequent side effect appeared in both treatment groups (60% group A and 65% group B) which was followed by arthritis (52% group A and 55% group B), headache (42% in group A and 39% group B) and loss of appetite (28.9% group A and 55.3% group B).

## CONCLUSIONS

Study concluded that comparable SVR rate was achieved for both study groups where sofoobuvir and velpatasvir treatment group achieved higher SVR as compared to sofoobuvir and daclatasvir group. Both treatments were effective to clear the viral load but when compared for side effects group A (sofoobuvir and daclatasvir) experienced fewer side effects as compared to group B. Moreover, fatigue, arthritis, headache, loss of appetite and anemia were found to be the most frequent side effects of the therapy.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the

research, authorship and/or publication of this article

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## Original Article

## The Impact of Educational Training on Nurses to Improve Knowledge about Practices Regarding Patients Safety after Cardiac Catheterization

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## ARTICLE INFO

## Key Words:

Nurses, Cardiac Catheterization Knowledge, Practice and Patient Safety

## How to Cite:

Saeeda Sania, Raja, ., Ali, S. ., & Ali, J. . (2022). The Impact of Educational Training on Nurses to improve knowledge about Practices Regarding Patients Safety after Cardiac Catheterization: Educational Training on Nurses about Practices Regarding Patients Safety after Cardiac Catheterization. *Pakistan Journal of Health Sciences*, 3(06). <https://doi.org/10.54393/pjhs.v3i06.303>

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Received Date: 2<sup>nd</sup> November, 2022Acceptance Date: 17<sup>th</sup> November, 2022Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

Cardiac catheterization is a severe health condition that needs standardized care strategies as well as qualified and skilled healthcare professionals to manage it effectively. **Objective:** To evaluate the impact of educational training on nurses to improve knowledge about patient safety practices after cardiac catheterization. **Methods:** This quasi-experimental study was accomplished among nurses working at cardiac units of both genders from March 2021 to September 2021. Non-probability convenience sampling technique was performed for the collection of data. The data was collected by utilizing the open-access structured tool of knowledge and practice. **Results:** Regarding the level of knowledge, pre-implementation of educational training, the majority of the participant had poor knowledge 15 (30%) and post-educational training, the knowledge level reached good knowledge (70.0%) and it was also found statistically significant p-value  $\leq 0.001$ . Similarly, a significant difference between nurses' practice after the implementation of the educational training shows (66.7%) inadequate practice before the intervention, while (83.3%) of them had an adequate level of practice after the intervention; it is also found to be a significant p-value  $\leq 0.001$ . **Conclusion:** The implementation of the educational training for nurses improved knowledge about practices regarding patients' safety after cardiac catheterization.

## INTRODUCTION

Cardiac illnesses are the most vital cause of morbidity and mortality worldwide [1]. Cardiac catheterization (including coronary angiography and angioplasty) is a standard diagnostic and therapeutic strategy for evaluating cardiovascular diseases. It needs qualified and skilled health providers to obtain a good management outcome [2]. Coronary angioplasty is a coronary intervention with mechanical stents to enhance the blood flow of coronary arteries [3]. Despite being a popular procedure, it is still fraught with complications. These complications include dye-related, anatomic, and vascular complications. In the United States alone, more than one million patients

undergo Percutaneous Coronary Intervention (PCI) each year, and major bleeding occurs at a rate of 1.7% after PCI [4]. The post-cardiac catheterized patients are at high risk of vascular complications. The most common complications are vascular access, such as painful hematoma, ecchymosis, pseudoaneurysm, arteriovenous fistulas, thrombo-emboli, and oozing. As a result, patients face additional discomfort in the form of extended hospital stays, higher hospital costs, and reduced quality outcomes [5]. A hematoma is a blood collection in the soft tissue and is recognized by local inflammation, rigidity, and pain. The management of hematoma needs pressure on the groin,

bed rest, and careful monitoring. Ecchymosis is the presence of skin discoloration, pain, and minor swelling and resolves with simple conservative treatment. Oozing can be stopped through continued manual pressure [6]. As established by research, nursing knowledge is insufficient about practice regarding patient safety after cardiac catheterization; therefore, there is a need to conduct educational sessions for nurses. Nurses, being the prime body of health care providers, must be able to assess, identify and manage the problems related to vascular site complications. Being involved the most at the patient's bedside, nurses should be able to work together to reduce vascular access complications and treat them when they arise. Therefore, a proficient nurse with comprehensive knowledge and practical capability is a key person for any healthcare institute, including cardiovascular intervention facilities. Specialized nursing care after the angiography and angioplasty is imperative to patient recovery to promote a better quality of care [7]. Complications after cardiac catheterization were 16.5%. These complications include hematomas fluctuating in size from 1 to 5 cm (15.5%), bleeding (1.5%), arteriovenous fistulas (1%), and pseudoaneurysms (0.7%). Therefore, the nurses should be expert enough to apply manual compression during the removal of the sheath and observe the vascular access complications as well as to know the techniques of sheath and TR band removal as part of the management of the patient after cardiac catheterization up to the point of discharge. Procedure protocols and staff education regarding vascular complications and post-procedure nursing care not only ensure patient safety and comfort but also reduce costs while at the same time improving the effectiveness of cardiac catheterization [8]. Good practice recommendations for percutaneous coronary intervention in the United Kingdom (UK), require that local operating policies be defined, including patient preparation, informed consent, and ward checklists. Nursing care should include care after angiography and angioplasty when the patient is shifted to either a ward or the recovery area. The main nursing care provider should instruct the patient to immobilize the limb with the puncture site and start vigilant observation of the vascular access area, hemodynamics and ECG monitoring. Furthermore, before discharge, proper advice and written instructions should be provided to the patient regarding vascular and other complications, schedule for return to work, proposed follow-up, drug therapy instructions, and planned interactions with formal cardiac rehabilitation programs [9]. The patients should be instructed to take a low-cholesterol diet and comply with lifestyle changes. A follow-up schedule should be arranged with the primary care physician and the cardiologist one week after the

procedure and then every three to six months for the first year [10]. Recent myocardial infarction is associated with a high risk of stent restenosis and increased mortality risk. Factors associated with good outcomes, including directions for the use of medication, should be discussed before discharge [11]. Investigators have pointed out that the quality of life in patients with coronary angiography, with persistent unclear chest pain before and after coronary angiography, experience more anxiety than those receiving a clear diagnosis. Patients with coronary artery disease (CAD) reported better total health status as compared with a final diagnosis of no CAD [12]. The nurses play an active role in the health behaviors of patients with myocardial infarction, in discharge planning and home health care, and in lifestyle that must be changed after MI, including medications, diets, cigarette smoking, alcoholism, and working life [13]. Moreover, further research is needed to explore the knowledge and practices of nurses related to post-cardiac catheterization care, for instance, methods of Trans-Radial and sheath removal. Finally, more research is needed to explore patient issues, develop standardized care policies, and enhance post-cardiac catheterization nursing care training to reduce vascular complications and obtain good health outcomes [14]. Hence, this study was accomplished to evaluate the impact of educational training on nurses to improve knowledge about patient safety practices after cardiac catheterization.

## METHODS

This quasi-experimental (pre and post) study was conducted over the period of seven months from March 2021 to September 2021 at a tertiary care hospital in Karachi, Pakistan. This study's target population was both genders with more than one year of clinical experience, and a valid license from Pakistan Nursing Council was enrolled. Nurses who were willing to participate and sign the informed consent form were included for the study. At the same time, the student nurses, those nurses who are working in managerial positions, were excluded from the study. The sample size was calculated by using OpenEpi software version 3.0. It was taken the interventional group before a training session, knowledge mean and standard deviation ( $43 \pm 86.0$ ), and after a training session, knowledge means and standard deviation ( $41 \pm 82.0$ ) [15]. It was calculated by taking a 95% confidence interval and 80% of the power. The calculated sample is 10 in each group. The total sample size is 20, but according to the easy availability of participants, the number of participants increased to 30. The non-probability convenience sampling technique was performed for the collection of data. Data was collected by utilizing the open-access structured knowledge about practices questionnaire to

assess the knowledge about practices regarding patient safety after cardiac catheterization and appropriate tools. This scale comprises 28 items. Amongst, ten items were related to the knowledge questionnaire, with responses classified as correct and incorrect. As for as practice-related questions, there were 18 items in the tool, and their responses were classified as always, sometimes, and never. Furthermore, data related to knowledge about the practice of patient safety after cardiac catheterization was collected from the study participants using a questionnaire before intervention (pre-test). Then the educational training intervention was given to all study participants and followed by a post-test from the same participants. The data was entered and analyzed by using the statistical package of social sciences (SPSS) version 21.0. To assess the knowledge and practices before and after the training program was measured by paired t-test.

## RESULTS

It was observed that 40% of male and 60% of female nurses participated in this study; Half (50%) of the study participants were under the age of 20-25 years, (43%) were 26-30 years of age, and only small proportion (6.67%) were 31- 35 years of age. According to the qualification distribution, most of the nurses (60%) were BS Nursing, and (40%) of them were nursing diploma-holder nurses. Experience distribution revealed that the majority (93.33%) of the nurses had less than 10 years of experience, and only (6.67%) of the study subject had an experience of more than ten years. An equal proportion of the study participant taken from each department, such as the Cardiac ward, CCU, and ICU nurses. Table 1 represents the demographic characteristics of nurses under the study.

Variables	N	%
<b>Gender</b>		
Male	12	40
Female	18	60
<b>Age</b>		
20-25	15	50
26-30	13	43
31 and above	2	6.67
<b>Professional Qualification</b>		
BS Nursing	12	40
Post RN BSc Nursing	6	20
Registered Nurse	12	40
<b>Professional Experience</b>		
1-10 Years	28	93.33
11 and above Years	2	6.67
<b>Population</b>		
Cardiac Ward Nurse	10	33.3
CCU Nurses	10	33.3
ICU Nurses	10	33.4

**Table 1:** Sociodemographic characteristics of study participants (n=30)

Nurses' knowledge and practice during pre and post-educational training, half of the participants 15 (50%) per knowledge was poor (Score  $\leq 40\%$  = Poor Knowledge). After the implementation of an intervention, the post-educational training, nearly two-thirds 21 (70%) of the study participants showed good knowledge (Highest  $\geq 40\%$  = Good Knowledge). It also supports the alternative hypothesis, and the p-value=0.001 was significant. Moreover, a significant difference was also observed between nurses' practice before and after the implementation of educational training. It is highlighted that about two-thirds 20 (66.67%) of the study participants had inadequate practice before the training according to the practice scoring system (Inadequate  $< 80\%$ ). In comparison, after the intervention of educational training, 25 (83.25%) of the study participants had an adequate level of practice (Adequate  $\geq 80\%$ ), and the p-value = 0.001 was found to be a statistical significance. Table 2. shows a significant difference between nurses' knowledge and practice during pre and post-educational training

Knowledge & Practice	Pre		Post	
	n	%	n	%
Knowledge				
Poor	15	50	9	30
Good	15	50	21	70
Mean $\pm$ SD	1 $\pm$ 0.1		1.70 $\pm$ 0.46	
Paired t-test	P-value = <0.001			
Practice				
Poor	20	66.67	5	16.75
Good	10	33.33	25	83.25
Mean $\pm$ SD	1.33 $\pm$ 0.47		1.83 $\pm$ 0.37	
Paired t-test	P-value = <0.001			

**Table 2:** Disclosed the nurses' knowledge and practice before and after the implementation of the educational training (n=30)

## DISCUSSION

Hussein *et al.*, investigated that post-cardiac catheterization nursing care is imperative for preventing vascular access complications and patients' safety. The nurse's sound knowledge and good practice enhance self-confidence and make them competent in their work [16]. The present study is an effort to assess the nurse's knowledge about practice regarding patient safety after cardiac catheterization. The current study revealed a significant difference between nurses' knowledge about practice pre and post-implementation of educational training regarding patients' safety after cardiac catheterization. After implementing post-educational training, the knowledge level reached (70%) directed to good knowledge. Similarly, Paul *et al.*, studied that there was a significant difference between pre and post-educational training regarding patients' safety after a cardiac catheterization, and the level of knowledge

improved after the implementation of educational training [17]. On the other hand, Al-Ftlawy disclosed that the nurse's knowledge was good before educational training [18]. It might be possible that almost half of their participants had already trained. That's why it was suggested to promote knowledge and performance regarding patient care after cardiac catheterization [19]. The present study identified a significant difference between pre and post-practice. In the pre-educational training, the majority 20 (66.7%) nurses had an inadequate level of practice, and in post-implementation, 25 (83.25%) of them had an adequate level of practice. Similarly, in Lahore, Pakistan, the nurse's practice was poor at 25.74%. In the same study Feroze et al., studied that nurses have adequate practice for instance, post-procedure care (78.4%), sheath removal (77.8%), applying manual pressure over catheter site (79.5%), measure stability for pain (76.0%), observe skin color & temperature (76.6%) discharge teaching (78.9%) [20]. The contradiction of the study was nurses of Sulaimani City found good practice in the post-cardiac procedure [21]. Nurses who have appropriate knowledge and practice can help in the restoration of cardiac patients. Similarly, Ali found that there is a positive and significant correlation between practice and knowledge post-implementation of educational training [15].

## CONCLUSIONS

It is concluded that implementing educational training, nurses' knowledge increased significantly, and improved patient safety practices after cardiac catheterization. The study also showed a positive and significant relation between nurses' knowledge about practice post-educational training, a high level of nurses' knowledge about practices can reduce the rate of vascular complications. Therefore, fundamental nursing care after the angiography and angioplasty is imperative to the patient's recovery to promote a better quality of care in daily practice.

## Conflict of interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Comparative Evaluation of Postoperative Pain Following Single Visit and Two Visit Endodontic Therapy in Non-vital Teeth

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## ARTICLE INFO

## Key Words:

Non-Surgical Root Canal Therapy, Necrotic Teeth, Endodontics, Postoperative Pain

## How to Cite:

Waseem, R. F., Khan, K. I., Khan, M., Moiz, A., Jehan, N., & Zahir, H. . (2022). Comparative Evaluation of Postoperative Pain Following Single Visit and Two Visit Endodontic Therapy in Non-vital Teeth: Postoperative Pain in Non-vital Teeth. *Pakistan Journal of Health Sciences*, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.313>

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Received Date: 3rd November, 2022

Acceptance Date: 19th November, 2022

Publication Date: 30th November, 2022

## ABSTRACT

Management of postoperative pain is a challenge for clinicians providing root canal therapy and a primary concern for patients as it directly affects their quality of life. Traditionally, multiple-visit endodontic treatment has been employed. In modern endodontics, single-visit endodontic therapy is becoming popular. **Objectives:** To compare frequency of postoperative pain following single and two-visit endodontic therapy in non-vital teeth. **Methods:** Randomized Controlled Trial was conducted at Operative Dentistry Department, Islamic International Dental Hospital, Islamabad. Each patient was assigned to group A or B with 140 participants in each group. Access, cleaning, and shaping were performed on the first visit. At the first visit, teeth in group A were obturated using guttapercha, whereas Group B was obturated after one week. Patients were instructed to mark the severity of pain at intervals of 6 hours, 24 hours, and 7 days after treatment. **Results:** 280 patients were divided into two groups of 140 each. Overall mean age and standard deviation was  $27.35 \pm 7.18$ . At 6 hours, 123 group A and 119 group B patients experienced pain. 113 patients in group A and 105 patients in group B reported pain at 24 hours. On the 7<sup>th</sup> day, the number of patients in groups A and B that had pain was 8 and 7 respectively. P-value was not statistically significant. **Conclusion:** This study found no difference in the incidence of postoperative pain in non-vital teeth, irrespective of the number of endodontic treatment visits.

## INTRODUCTION

The management of postoperative pain is a significant challenge for clinicians providing non-surgical root canal therapy. It is also a primary concern for most patients as it directly affects their quality of life [1]. Incidence of postoperative pain after endodontic treatment has been reported to be between 3-58% [2]. Another important factor, is the number of visits required to complete the treatment. Traditionally, multiple-visit endodontic treatment has been employed as a safe routine, especially in non-vital teeth, with the first visit directed at alleviating pain and determining the response of tissues to the treatment [3-5]. Single-visit root canal treatment, is considered appropriate for teeth with vital pulp tissue [6].

In modern endodontics, single-visit endodontic therapy is becoming extremely popular as it favors both the dentist and the patient. It offers several advantages including decreased cost, greater patient acceptance, fewer visits to the dental office, shorter chairside time, and reduced incidence of postoperative flare-ups [7-9]. However, the advantages such as the opportunity to reduce microbial counts and biofilms by the placement of intracanal medicament and repeated irrigation, along with increased patient comfort due to shorter duration of appointments, especially in case of medically compromised patients makes multiple visit root canal treatment an effective alternate treatment strategy [10, 11]. Research has shown

that there is no significant difference in the antimicrobial efficacies when single and multiple-visit treatments are compared in teeth with vital pulps [12-14]. Moreover, in a systematic review, postoperative pain was reported to occur as frequently after single-visit endodontic treatment as multi-visit treatment in vital teeth [9, 13, 14]. However, teeth with non-vital pulp pose a microbiological obstacle. The unsuspected inoculation of bacteria into the apex remains a concern with single-visit treatment. There is no agreement on the appropriateness of this approach in non-vital teeth. Some studies advocate that the use of an intra-canal medicament between appointments is mandatory for adequate disinfection of the root canals. On the contrary, many researchers have reported that the success of the treatment is not affected by the number of visits even for teeth with necrotic pulps [15-17]. A systematic review reported conflicting findings and claimed that the healing rate was 6.3% higher for single-visit cases [16]. A study conducted in Karachi compared the prevalence of postoperative pain relative to the number of endodontic treatment visits. They reported similar occurrences of pain with single and multiple visits at 6 hours follow-up but better results with multiple visit root canal treatment after 12 and 24 hours. Their study, however, included both vital and non-vital teeth [7]. Most of the data available in the literature are for vital teeth. Studies performed on non-vital teeth are inconclusive and mostly retrospective [15, 17-19]. This study aimed to investigate any correlation between dental pain experienced after root canal treatment of necrotic teeth and the number of treatment visits. Results obtained from this study will help in planning treatment visits and subsequently reducing postoperative pain, thus assisting the clinician in patient management.

## METHODS

This randomized control trial was conducted in the Operative Dentistry Department of Islamic International Dental College and Hospital, Islamabad from July 2018 to January 2019. An institutional ethical committee approved the proposal. A sample size of 280 patients was calculated (140 in each group) as follows. A population proportion of pain on the 7th day after treatment from a previously reported paper (0.105 in single visit group vs. 0.23 in multiple visit group) was used by an Open epi online calculator with the power of test (95%) and level of significance at 5%. The inclusion criteria was set as patients in the age range of 12-40 years diagnosed with non-vital mature teeth with fully formed apices requiring root canal treatment. Teeth with weakened periodontal support, insufficient and non-restorable remaining tooth structure, severe pre-operative pain, acute abscesses and cellulitis, multiple teeth with pulp diseases requiring

endodontic therapy, teeth requiring retreatment, patients who had complicating systemic disease, and patients using medications such as analgesics, antibiotics or corticosteroids were excluded from the study. Prior to their inclusion in the study, informed, verbal and written, consent from the patients was obtained. After selection according to the inclusion criteria, the patient was informed about the procedure of nonsurgical root canal and his/her participation in the present research. A consent form was signed. Non-probability convenience sampling technique was used. The patient was either allotted to the single visit group (Group A) or two visits group (Group B). On the first visit, the clinical procedure for each group included local anesthesia administration using 2% Lignocaine with 1: 80000 epinephrine, followed by isolation with a rubber dam and preparation of an access cavity. A periapical radiograph and an electronic apex locator, Dentaport ZX apex locator (J. Morita, Japan) were used to measure the correct working length. Disinfection was done using 2.5 % sodium hypochlorite and 17% EDTA as irrigating solutions. Canals were prepared using Gates Glidden drills in sequential order for orifice opening, followed by glide path preparation till #20K file. Cleaning and shaping were completed with Hyflex EDM rotary files using the crown-down preparation technique. 17% EDTA was used as the final rinse. Paper points were used to dry the prepared canals. Gutta percha and calcium hydroxide sealer, Sealapex (Kerr) were used to obturate teeth in the single-visit group (Group A). Cold lateral condensation technique was used. Whereas in the multiple visit group (Group B), a non-setting calcium hydroxide medicament was placed in the canals and a temporary restoration material, Cavit (3M ESPE), was used to seal the access cavity. Patients in Group B were requested to visit again after 1 week. Their teeth were obturated using the cold lateral condensation technique with similar materials as group A. All patients were prescribed 550 mg of naproxen sodium, to be taken twice daily only in case of moderate pain. Patients were requested to report back to the department in case of intolerable pain for emergency treatment. The post-treatment pain evaluation was carried out with the modified visual analogue scale (VAS). Each patient was given a form and they were explained how to fill the form based on the presence and severity of pain. The patients were instructed to mark the postoperative pain severity at intervals of 6 hours, 24 hours, and 7 days following treatment. Patients were requested to return for clinical examination 1 week after completion of the root canal treatment for pain assessment. All procedures were done by the same clinician to minimize bias. Data analysis was performed with SPSS version 20.0. To compare the frequency of pain between the two groups, the chi-square

test was used. Mean  $\pm$ SD was noted for age of the patient, frequency, and percentage for gender and pain at 6 hours, 24 hours, and 7 days. A p-value of  $<0.05$  was considered significant.

## RESULTS

None of the patients included in this study were lost to follow-up. The overall mean age and standard deviation was  $27.35 + 7.18$ . Similarly, the mean pain scores in both groups were  $3.03+1.76$  and  $2.88+1.83$  respectively. The frequency of pain according to age and gender was calculated (Table 1).

Age Group	Group	Male	Pain		Female	Pain		P-value
			Yes	No		Yes	No	
1 (12 to 22)	1	20	2	18	15	3	12	0.62
	2	19	3	16	13	3	10	
1 (12 to 22)	1	38	16	22	32	11	21	0.96
	2	36	15	21	30	15	15	
1 (12 to 22)	1	20	7	13	15	3	19	0.38
	2	18	10	8	24	3	19	

**Table 1:** Frequency of pain according to age and gender

Male patients in Group A reported that at the 6-hour interval, 88% had pain. At the 24-hour interval, 79% had pain and on the 7th day, only 6% of patients reported pain. In Group B, 90% had pain at the 6-hour interval, 75% had pain at 24 hours and only 9% reported having pain on the 7th day (Table 2).

Time interval	Group A Frequency (%)	Group B Frequency (%)
6 hours	69(88%)	66(90%)
24 hours	62(79%)	55(75%)
7 days	5(6%)	7(9%)

**Table 2:** Pain in males at different time intervals

In female patients Group A reported that at the 6-hour interval 87% had pain. At the 24-hour interval, 82% had pain and on the 7th day, 2% of patients reported pain. In Group B, 79% had pain at the 6-hour interval, 76% had pain at 24 hours and 9% reported having pain on the 7th day (Table 3).

Time interval	Group A Frequency (%)	Group B Frequency (%)
6 hours	54(87%)	53(79%)
24 hours	51(82%)	51(76%)
7 days	1(2%)	6(9%)

**Table 3:** Pain in females at different time intervals

The frequency of pain was according to the time interval and the Chi-Square Test (Table 4). At the 6 hours interval, the result (0.24) showed no correlation between pain and treatment visits. The calculated p-value was 0.97 which was not statistically significant. At the 24 hours interval, the result (0.80) showed no correlation between pain and treatment visits. The calculated p-value was 0.84 which was not statistically significant. On the 7th day, the result (0.68) showed no correlation between pain and treatment

visits. The calculated p-value was 0.71 which was not statistically significant.

Parameter	No pain	pain	Percentage of pain	Total	Chi-square	p-value
<b>Frequency of pain at 6 hours</b>						
Single	17	123	88%	140	0.24	0.97
Multiple	21	119	85%	140		
Total	38	242	86%	280		
<b>Frequency of pain at 24 hours</b>						
Single	27	113	81%	140	0.80	0.84
Multiple	35	105	75%	140		
Total	62	118	78%	280		
<b>Frequency of pain at 7 days</b>						
Single	132	8	6%	140	0.68	0.71
Multiple	133	7	5%	140		
Total	265	15	5%	280		

**Table 4:** Frequency of pain at 6 hours, 24 hours, and 7 days

## DISCUSSION

Results of the current study demonstrate no significant correlation between the number of visits and postoperative pain incidence. The findings of the present study support our initial hypothesis that there is no difference in the success rate between single-visit and two-visit endodontic therapy. This allows not only the dentist but also the patient to have the liberty to tailor treatment according to their individual interests. Our findings are similar to those of other studies reported in the literature for permanent teeth. Systematic reviews by Wong et al. and Sathorn et al. also support that the number of primary treatment visits has no effect on the endodontic treatment outcome and postoperative pain incidence [3, 16]. Moreira concluded in a systematic review that both treatment forms showed similar results regarding repair or success rates regardless of the preoperative status of the tooth [20]. Canal preparation using the crown down technique permits improved irrigation and reduces the apical extrusion of debris. These results are also consistent with those of another study which reported that within 24 hours of completion of endodontic treatment, the incidence of post-treatment pain was higher in the two-visit group compared with the single-visit group. After the initial 24 hours, the pain diminishes. Most of the patients are free of pain by the 7th day [21]. On the contrary, Su et al., Schwendicke et al., and Mubarak et al., have reported a decreased incidence of pain in endodontic cases treated in a single visit. The repetitive physical and chemical insults to tissues around the apex that result from instrumentation and medicament placement in multi-visit treatments are evaded in single-visit treatments. Multiple visit treatments also require the placement of temporary restorations which pose a risk of bacterial reinfection of the disinfected root canals [15, 22, 23]. These factors may be responsible for the reduced incidence of pain associated with single-



visit endodontic therapy. Yoldas et al., conducted a study evaluating postoperative pain in cases requiring endodontic retreatment. He concluded that in retreatment cases, postoperative pain was less frequent when treatment was done in multiple visits, with an intra-canal dressing placed between appointments [24]. This could be attributed to the greater resistance of bacteria associated with re-infections.

## CONCLUSIONS

This study reports no difference in the incidence of postoperative pain in non-vital teeth, irrespective of the number of endodontic treatment visits. Single and multiple-visit root canal treatments had the same healing rate. It is proposed that future studies, like clinical trials with larger sample sizes, should be conducted to figure out the difference in the incidence of postoperative pain so that a treatment protocol can be recommended predictably.

## Conflicts of Interest

The authors declare no conflict of interest.

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Effect of Educational Intervention on Nursing Care in Patients Diagnosed with Thalassemia Major

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## ARTICLE INFO

## Key Words:

Thalassemia major, Nursing Knowledge, Nursing practices

## How to Cite:

Tabussam, S. ., Afzal, M. ., Sarwar, H. ., & Khan, S. . (2022). Effect of Educational Intervention On Nursing Care in Patients Diagnosed with Thalassemia Major: Educational Intervention on Nursing Care in Thalassemia Patients. *Pakistan Journal of Health Sciences*, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.357>

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Received Date: 14<sup>th</sup> November, 2022Acceptance Date: 26<sup>th</sup> November, 2022Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

Pakistan have highest burden of thalassemia major patients. These patients have life expectancy of ten years in Pakistan which is very low as compare to other countries. High-quality nursing care and management of thalassemia major Patients is essential. **Objectives:** To evaluates the understanding of nursing care quality among patients of thalassemia major which frequently have an effect on the patient's mental and physical health harmfully. **Methods:** Quasi experimental study was conducted in Mayo Hospital Lahore. The study population was those nurses who were working in thalassemia care units. 30 nurses have been taken by using purposive sampling technique. Data was collected by using an adopted tool to assess the nurse's knowledge and their practices about care of thalassemia major patients. **Results:** Most of the nurses included in the study had a general nursing diploma 29(76.67%). The average experience of nurses was 6.04±3.57 years, and 97.7% of nurses did not receive any training on thalassemia care. Total post knowledge was 49.37±7.686 and total practices score was 61.13±11.672. These findings revealed that continue educational program for nurses improve these variables. **Conclusions:** The present study depicted that majority of nurses have not received any training about nursing care of thalassemia major patients. So, teaching program had a good impact on nurse's understanding of thalassemia, as well as their practice.

## INTRODUCTION

The major community problem is thalassemia over the world that is most common inherited disorder [1]. This is described as a fault in the genes which are accountable for the hemoglobin production. Hemoglobin contain alpha and beta chains. In case of intrinsic changes wait for course of activity of beta cell chains at that point beta thalassemia happens which joins scattered progression of withdrawn blood elements [2]. Alpha thalassemia happens due to deletions and point mutations in alpha-globin genes and inadequate alpha production [3]. Thalassemia major patients are born normal at birth but later they develop serious fall in HB and develop anemia in the first year of their life [4]. Thalassemia major patients suffer from heart failure can died between 20 to 30 years. Patients with

thalassemia major require a significant set up management of routine blood transfusion each three to four weeks, and chelation treatment to push out iron from the body makes a refinement create well again the result [1]. Thalassemia is a challenge for thalassemia patients and thriving worry framework. Because these patients need a lifelong treatment of transfusion and chelation therapy [5]. Annual births of 5000 children every year in Pakistan. The estimated carrier rate is 11%, with 9.8 million carriers in the total population. One lakh is the most commonly expected figure of thalassemia major patients which are dependent of blood-transfusion in Pakistan. This adds to a yearly loss of 1.46 million to 2.92 million disability adjusted life years which leads a vast financial burden internationally [6]. The

estimated life of thalassemia major children is approximately ten years in our country which is too much low from the international standard [7]. The reason of this short life expectation can be the inappropriate nursing knowledge and nursing practices [8]. The foundation of thalassemia major patient's care is transfusion of blood. Pakistan needs to take basic movement for improvement of nursing care of thalassemia major patients. The rationale of treatment is double toward move forward the shortcoming and to cover the inadequately erythropoiesis. Mistakes and insufficiently organization of patients during transfusion can cause to serious hazards to individuals with thalassemia major [9]. Nurses are responsible for care of patients with thalassemia major and this is the basic part of their duty [10]. Nurses have to be outline understanding of the patients' needs. Quality of nursing care includes that things have been done right, moving forward almost to thalassemia patients and the community [11]. The nurse plays a critical role in thalassemia major patients care of patients with disorders of hemoglobin [10]. This disease is very tough to manage properly and life threatening if it left untreated. However, this situation can be managed effectively if we share professional knowledge and expertise about its prevention and treatment [12]. Nursing care can subsequently be seen to be obliging sincerely and skillfully to fulfill the necessities of thalassemia major patients. Lack of education is a barrier to optimal care, which should be addressed in thalassemia units [13]. Thalassemia major patient's nurses should be aware about the disease and management because nurses play an important role in every healthcare team for caring patients [14]. Good nursing services given to thalassemia patients in Pakistan are not sufficient as compare to world [15]. This study evaluates the understanding of nursing care quality among patients of thalassemia major which frequently have an effect on the patient's mental and physical health harmfully. So, nurses having knowledge and health-related practices about thalassemia major will develop the nursing care of patients diagnosed with thalassemia major, reduce the stay of patients in hospital, and automatically it will reduce the economic burden of patients and the country.

## METHODS

A quasi experimental study design was adopted to evaluate the effect on nursing education, practices related to nursing care of patients diagnosed with thalassemia major. Data were collected by purposive sampling technique from thalassemia units in Mayo Hospital Lahore. The calculated sample size was 30 nurses, who are working in the pediatric medicine hematology and thalassemia care units. Male and female nurses both are included in the study. Student nurses and management level nurses were also excluded from the study. The researcher collected data about

nurse's knowledge and practices regarding thalassemia patients nursing care, disease management during transfusion of blood and iron chelation. A validated tool has been used for data collection. Socio demographic features of nurses that include sex, age, marital status, education, any training about thalassemia and knowledge of nurses about caring to patient's with thalassemia major. Knowledge total score was 100% and considered poor if it was (less than 60%), if the percentage was between (60 - 75%) it was considered average, and it was considered good if the percentage was more than 75 %. Less than (80%) practices were considered unsatisfied and considered satisfied if they were (80 % and more). Permission from the higher authorities of university as well as inform consent were taken. Data were entered and analyzed in SPSS version 25.0. Mean and standard deviation were used for quantitative variables and frequency and percentages for qualitative variables. Paired sample t- test was applied to compare the scores of knowledge and practice. P-value  $\leq 0.05$  is considered statistically significant.

## RESULTS

In this study, the mean age of nurses was  $28.73 \pm 3.15$  years, where 60% of them were between the age group of 20-<30 years and 40% of them were 30-<40 years of age group. Out of the total 30 nurses, 01(3.3%) were male and 29(96.7%) were females. Most of the nurses included in the study had a general nursing diploma 23(76.67%). The average experience of nurses was  $6.04 \pm 3.57$  years, and 97.7% of nurses did not receive any training. All these results are shown in Table 1.

Variables	N(%)
<b>Age (in years)</b>	
20 - <30	18 (60%)
30 - <40	12 (40%)
Mean $\pm$ SD	28.73 $\pm$ 3.15
<b>Gender</b>	
Male	01 (3.3%)
Female	29 (96.7%)
<b>Educational Level</b>	
Diploma in General Nursing + Midwifery	25 (83.34%)
Bachelor of Science in nursing	02 (6.67%)
Master's degree	01 (3.33%)
Specialty (any)	02 (6.67%)
<b>Years of experience</b>	
1-5	16 (53.33%)
6-10	07 (23.33%)
Above 10	07 (23.33%)
Average experience	6.04 $\pm$ 3.57
<b>Number of times blood transfusion performed over the past 6 months</b>	
5-8 times	03 (10%)
9-12 times	06 (20%)
More than 12 times	21 (70%)

Training program	
Yes	01(3.3%)
No	29(97.7%)
Required area(s) of training relating to transfusion	
Sampling	04(13.33%)
Collection of blood bag	01(3.33%)
Administration	11(36.67%)
Adverse reactions	10(33.33%)
Serious hazards	03(10.00%)
None	01(3.33%)

**Table 1:** Distribution of Nurses' socio-demographic characteristics

Table 2, Reveals nurse's knowledge and practices about thalassemia major patients, pre and post program implantation. Post program test shows significant improvement in knowledge and practices of nurses caring thalassemia major patients. After program implementation the success rate of nursing care was 93.33%. In this study, the knowledge and practices items of nurses about thalassemia major disease and blood transfusion were highly significant ( $P < 0.05$ ) and mean scores were improved after educational training implementation of the program.

Items	Pre Program Mean $\pm$ SD	Post Mean $\pm$ SD	Paired t test	p-value
Total Knowledge	26.43 $\pm$ 1.593	49.37 $\pm$ 7.686	11.642	.000
Total Practice	35.67 $\pm$ 13.66	61.13 $\pm$ 11.672	11.653	.000

**Table 2:** Pre & post-program implementation of nurses' knowledge and Practice

## DISCUSSION

A complex series of illnesses known as thalassemia is prevalent in Southeast Asia and the Mediterranean. Its is very important to help thalassemia patients become aware of their disease and learn good self-management, nursing support is required, avoiding problems, using procedures, and transferring paediatric patients to the medical staff and genetic counselling. In the treatment of thalassemia patients, the nurse is essential. Therefore, it is crucial to provide a nursing service that is seamless, integrated and appropriate for patients in either acute or community settings. Furthermore, nurses are critical in assisting thalassaemic patients in becoming aware of their disease and learning effective self-management techniques [16]. In the current study, thirty nurses who provided care for thalassemia patients receiving blood transfusions were included. Sixty percent of these nurses were between the ages of 20 and 30. This finding may be related to the fact that nurses in this age range frequently provide care for thalassemia patients receiving blood transfusions. The current study's findings showed that the average experience was 6 years and 97.7% had not participated in the training. It may be related to the lack of nursing staff, which prevents these units from allowing

them to attend any training sessions to prevent interruptions in work due to their absenteeism, or it may be related to the fact that the unit lacks nurse training programs [17]. Elewa revealed in his study that more than two-fifths of them had less than five years' experience and that more than two-thirds had not participated in training programs on thalassemia and blood transfusions [18]. Regarding educational attainment, the majority of nurses in the current study were general nursing diploma holders, which may provide insight into the state of nursing qualifications today. A study showed that almost half of thalassemia patients (48.5%) were getting poor quality of care. Nurses have poor knowledge and improper practice for the management of thalassemia major patients [13]. In the current study after program implementation the success rate of nursing care was 93.33%. A study concluded that studied nurses showed an improvement in their knowledge and practices regarding blood transfusion after the implementation of guidelines. The educational programme had a positive impact on nurses' understanding and practise of thalassemia, blood transfusion, and chelation therapy, according to study results, which enhanced the standard of nursing care for patients with thalassemia major [18]. In the current study, nurses' knowledge was unsatisfactory, which may have been due to poor basic education preparation, a lack of interest on their part in learning new skills, work overload, or a lack of ongoing educational opportunities regarding the care of patients with thalassemia receiving blood transfusions. If nurses can transfuse blood and its components appropriately, scientifically, and safely, the likelihood of blood transfusion dangers will be minimized. Nurses play a major part in this process [19]. According to the results of the current study, there was very poor percentage of nursing practice domains of the nursing role in the initial phase of blood transfusion, during transfusion, after blood transfusion, vital sign measurement, and iron chelation therapy delivery. The findings of this study confirmed a statistically significant differences between pre-and post-educational programs with regard to the nursing knowledge and practices. This study outcomes can be attributable to the educational program's beneficial impact on nurses' practice. In the same vein, the lack of supervision, nurses' negligence, a lack of training and orientation program for the nurses, may be the reason for incompetence in practices of nurses prior to the implementation of educational program. These findings were supported by Cappellini et al [20].

## CONCLUSIONS

The study outcomes ensured that the teaching program had a good impact on nurse's knowledge and practices for

the care of thalassemia major patients. There is an urgent need to start an educational program on nursing care of thalassemia major patients based on knowledge and practices. Alternatively, the patients of thalassemia major are at risk of acquiring bacterial infection and serious reactions due to poor nurse's knowledge and their practices. Deprived of resolving the present condition, patients attain good quality nursing care is a patient's right which will remain to be violated subsequently it will cause poor patients management.

### Conflicts of Interest

The authors declare no conflict of interest

### Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Effect of Educational Program on Emotional Distress of Hepatitis C Virus Patients Undergoing Antiviral Treatment Therapy

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## ARTICLE INFO

## Key Words:

Educational Program, Emotional Distress, Hepatitis C Patients, Antiviral Therapy

## How to Cite:

Sahar, N. ., Yaqoob, A. ., & Afzal, M. . (2022). Effect of Educational Program On Emotional Distress of Hepatitis C Virus Patients Undergoing Antiviral Treatment Therapy: Emotional Distress of Hepatitis C Patients Undergoing Antiviral Treatment . Pakistan Journal of Health Sciences, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.350>

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Received Date: 11<sup>th</sup> November, 2022Acceptance Date: 26<sup>th</sup> November, 2022Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

Majority of hepatitis C patients undergoing antiviral therapy have emotional distress which leads to face anxiety accompanies depression. Presence of increased anxiety and high depression may markedly increase fear among these patients which may lead to decreased willingness more refusal to have antiviral therapy. **Objectives:** To assess the effect of educational program on emotional distress of Hepatitis C virus patients undergoing antiviral treatment therapy. **Methods:** A one group pretest- posttest quasi experimental study was conducted in the Hepatitis C department of Jinnah Hospital Lahore, Pakistan. A purposive sample of n=32 patients was recruited. Adult patient, have a confirmed diagnosis of Hepatitis C, Age 18-60 years, on antiviral therapy for last 12 weeks were recruited. A, 6 weeks and 6 educational intervention sessions were provided. Each session consisted of 45-60 minutes. Validated tool of hospital anxiety and depression scale was used for data collection from participants to assess the emotional distress. Data were entered and analyzed using SPSS version 21.0. Comparison of emotional distress scores before and after the intervention was analyzed using a paired t sample. A P value  $\leq 0.05$  was considered statistical significant. **Results:** The study results revealed a significant effect of the educational intervention program on emotional distress (Pre interventional emotional distress score  $30.66 \pm 5.807$  and post interventional emotional distress score  $19.03 \pm 5.433$ ) among hepatitis C patients (p- value  $<0.001$ ) **Conclusions:** It is concluded that Nursing education program has effect on emotional distress among HCV patients undergoing antiviral therapy.

## INTRODUCTION

Chronic diseases of Liver such as Hepatitis especially, Hep C infection of liver is becoming a great concern for health care systems in all parts of the world. Developing part of the world, where countries are not managing it effectively like our own country Pakistan, the bad chronic effects of hepatitis c disease vary and the last complicated status is severe fibrosis occurrence or cirrhosis occurrence [1]. The World Health Organization (WHO) statistics suggested that around 3% population in the world has got the hepatitis c infection and disease. It is stated that more than 170 million populations are chronic carriers and if not managed will be at increased risk of developing liver complications such as cirrhosis of liver [2]. Treatment of chronic hepatitis C causes anxiety and depression which leads to

unsuccessful completion of the full course of treatment [3]. More than 50% of the patients experience emotional distress with facing sever anxiety for strict follow up of treatment process. Emotionally distress patient exhibits symptoms like irritability, feeling anger and increased restlessness. Majority of such patients with Hepatitis c, receiving antiviral treatment report an increased emotional distress [4]. Depression among hepatitis c diseased patients with receiving antiviral treatment is found to be one very common side effect. Moreover, these patients also experience irritability, decreased energy level, lack of personal interest in things, and difficulty in sleeping or may be oversleeping [5]. Many countries in the world stated that people with Chronic Hepatitis C



infections who are undergoing antiviral therapy may hold more stress and depression. Due to increased number of such patients they were reluctant to start the treatment of antiviral therapy. In case of proper education among the patients undergoing antiviral therapy, the treatment may have great improvement in successful treatment [6]. Patients who are having hepatitis C virus infection and undergoing through antiviral therapy may pass through some serious phases of amplified frustration, poor anger management and bigger depression. Presence of increased anxiety and high depression may markedly increase fear among these patients which may lead to decreased willingness more refusal to have antiviral therapy [7]. In various trials, a large number of patients with anti-viral therapy reported high level of anxiety and depression which further lead to suicidal thoughts or suicidal attempts. According to literature more than 33% hepatitis C patients undergoing antiviral therapy have depression. Many of the patients discontinued the treatment of antiviral therapy due to increased level of anxiety and depression [8]. This anxiety and depression many a times reach to a maximum level where several patients may discontinue the treatment or disturb or decrease the doses. This is because of the increased level of depression and decreased the coping level with the signs and symptoms and side effects of the therapy [9]. It is quite obvious from the practices of nurses that the advanced nurse practitioners or nurses with advanced skills and education have the opportunity to provide very skillful management and sound scientific education to all patients with chronic hepatitis C disease [19]. It is believed that with proper nurses' guidance and education the chance of hepatitis C disease and its associated complications are being eradicated [10]. Nurses are the source of support to patients and enable them to discuss and convey their issue to the health care team who can make suitable changes in prescription and provide other suggestions that are more helpful to handle these problems. Such preventive steps by nurses may lead patients towards healthy happy life [11]. A randomized control study was conducted at the National Liver Institute, Menoufiya, Egypt to find the effectiveness of a nurse-led teaching intervention and found a substantial reduction in Hepatitis C virus emotional distress after the intervention compared to before [12]. The positive benefits of psychosocial psychotherapy on emotional discomfort were supported by the another study's findings [13].

## METHODS

A quasi experimental pre-post study design was used to carry on this study. This study was conducted at the Hepatitis C Clinic of Jinnah Hospital, Lahore, Pakistan. The

study participants were all patients coming to Hepatitis C clinics meeting the inclusion criteria. Patients, who were Adult conscious with a confirmed diagnosis of Hepatitis C, Age 18-60 years old, on antiviral therapy, Both Male and female patients were recruited. Patients, who were had developed Liver Cirrhosis or Liver Carcinoma, having physical trauma, and having no emotional distress were excluded from the study. An educational program was developed with the help of different books, internet material and gastro experts. The educational intervention consisted of 6 sessions where each session consisted of 45-60 minutes. This was done through different learning methods like individual based lecture, groups' discussion and distribution of handout. To conduct this educational program, the participants were approached individually on the day of their follow-up at the outpatient department. The educational interventions plan started from January, 2022 till June 2022, where each study participant received all the education sessions one by one each month during their OPD visits. Emotional distress was measured by Hospital anxiety and depression scale: Developed by Lorig et al., [14]. This tool consists of total 14 items. Each item is scored on a scale of 0-3. Zero means not at all and 3 means all the times. Total questionnaire score ranges from (0) minimum to (42) maximum score. Emotional distress is operationally defined and measured as below: Score <14 or <33.33%= normal (no emotional distress). Score from 14-24 or 33.33%-57.13%= (mild emotional distress). Score >24-34 or 57.13%-80.95%= (moderate emotional distress). Score >34 or >80.95% (severe emotional distress). The hepatitis C patients coming for antiviral treatment were approached for data collection. To assess the emotional distress among the hepatitis C patients as a pre assessment, self-administered closed ended Urdu translated questionnaires were provided. After the intervention, the participants were asked to fill the data collection tool of Emotional distress again to assess the comparison. Data of the study participants were entered in statistical software SPSS version 21.0. Results of the study were presented as mean  $\pm$  standard deviation through tables. Emotional distress pre and post score was compared using Paired t-test after checking for normality test assumptions. p-value < 0.05 as standard value was considered as significant value.

## RESULTS

Table 1 below shows that 8 (25%) research participants were between the ages of 18-40 years' age group, 8 (25%) were 41-53 years of age and remaining 16(50%) were >53 years of age. It was also found that 15 (46.9%) participants were male and 17 (53.1%) were female participants. Furthermore, it is also shown that that in relation to marital

status 71.9% of the study participants were married and on the other hand only 9(28.1%) of the study participants were unmarried. Moreover, majority of participants i.e.21 (65.6) had monthly income between 17,000. 17 (53.1%) of the participants were uneducated, 9 (46.9%) of them were having education up to matric and no one was with education above level or above.

Age in (Years)	N(%)
18-40 years	8(25%)
41-53 years	8(25%)
> 53 years	16(50%)
Gender	
Females	17(53.1%)
Male	15(46.9%)
Marital Status	
Married	23(71.9%)
Unmarried	9(28.1%)
Monthly Income/PKR	
<17,000 PKR/month	8(25%)
17,000-30,000 PKR/month	21(65.6%)
>30,000 PKR/month	3(9.4%)
Education Status	
Uneducated	17(53.1%)
Up to Matric	15(46.9%)
Graduation and Above	0(0.0%)

**Table 1:** Demographic characteristics of participants(n=32)

Below table 2 shows the participants' emotional distress in the pre interventional and post interventional groups. Results of the study found that before the educational program a good majority 13(40.6%) of the participants were having severe emotional distress and 12 (37.5%) had moderate emotional distress. After the intervention, there was no any participant with severe emotional distress whereas only 3 (9.4%) of the participants had moderate emotional distress.

Emotional Distress	Pre [n (%)]	Post [n (%)]
No Emotional Distress	0(0.0)	12(37.5)
Mild Emotional Distress	7(21.9)	17(53.1)
Moderate Emotional Distress	12(37.5)	3(9.4)
Severe Emotional Distress	13(40.6)	0(0.0)

**Table 2:** Emotional distress pre and after intervention

Table 3 below indicated that a paired sample t-test was used to evaluate the effect of educational intervention on participants' emotional distress. A very highly significant mean difference was found (+11.03) on emotional distress between pre and post interventional scores of Hepatitis C patients undergoing antiviral therapy  $t(8.537) =$ ,  $p$ -value=0.000, with mean and SD (30.66 ± 5.807 vs. 19.03 ± 5.433). It is shown by the study results that interventional program has a significant effect on participants' emotional distress.

Variables	Pre-intervention Mean ± SD	Post-intervention Mean ± SD	t	p-value
Emotional Distress	30.66±5.807	19.03±5.433	8.537	.000

**Table 3:** Mean and standard deviation of emotional distress pre and after intervention

## DISCUSSION

The results findings of this current study revealed that the studied participants were having age in years as (46.25 ± 9.553). This finding is supported by the result of a previous study which assessed the effect of nursing educational program intervention on the emotional distress of the patients having hepatitis C infection and going through the treatment of antiviral therapy, where also the age average of participants was (40 ± 16.57893) years [15]. Also the finding of this current study is in line with a previous study, which carried out research to assess the effect had by nursing education protocols on selected depression issues caused by antiviral therapy among hepatitis C patients. Findings collected by Malky et al., study revealed similar results which showed that the average age of study participants was 41.06 ± 9.31 in years [16]. In contrast to the current study, Aas et al., study used a low age mean, slightly above than half (55.6%) from the intervention group were found to have the average age of more than 20 years and more than one third of the control group (38.9%) having an average age of 19.4 years [17]. The current study's findings showed another highlighted finding where a prominent and statistically significant decrease was found in the emotional distress among the participants in post interventional stage. Initially there were 0% who had no emotional distress and after the intervention 37.5% in post-program levels had no emotional distress. The result of a previous study revealed in support to the current study where it was revealed that the emotional distress had a good improvement in participants post educational program than pre educational program [15]. Furthermore, Malky et al., claimed that nursing intervention program was the key element for management of patients' emotional distress among hepatitis C infected patients [16]. Similar results were found by Aas et al., which found that after program implementation there was a highly statistically significant decrease in the severity of overall emotional distress compared to before the program [17]. The psycho-educational nursing program had a favorable impact on the psychological stress among the hepatitis C virus research patients, providing evidence in support of the current study [19]. Ahmed et al., obtained similar result in their research where significant changes between the intervention group were seen before and three months after program implementation ( $t_1=4.25$ ,  $P=0.002$ ). Interactive digital-based education significantly reduced the emotional

discomfort of the intervention group in all facets of hepatitis C self-management [20].

## CONCLUSIONS

The most important component of the care strategy for hepatitis C virus patients receiving antiviral treatment therapy is the nursing education intervention program. Interactive healthcare improvements in emotional distress is among the HCV outcomes that have been positively impacted by educational programs on self-management of hepatitis C. Additionally, it significantly contributes to bettering Hepatitis C control and encourages patients to lead healthier lifestyles. Finally, the educational program proved to be a valuable tool for enhancing HCV emotional distress and reducing emotional distress as evidenced by the favorable results recorded for the participant participate in intervention group.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The authors received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Knowledge, Attitude, and Perception of Women Regarding C-Sections during their Antenatal Period

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## ARTICLE INFO

## Key Words:

Mode of Delivery, Lower Segment Caesarian Section, Awareness, Pregnancy, Vaginal Delivery

## How to Cite:

Jamil, K., Baqir, S. R., Aslam, S., Iqbal, R., Ilyas, Y., & Fahim, M. F. (2022). Knowledge, Attitude, and Perception of Women Regarding C-Sections during their Antenatal Period: Perception of Women Regarding C-Sections. *Pakistan Journal of Health Sciences*, 3(06).

<https://doi.org/10.54393/pjhs.v3i06.320>

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Received Date: 4th November, 2022

Acceptance Date: 16th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

C-Section is a surgical procedure in which a mother gives birth to a child through the abdomen by the incision of the uterus. The prevalence of CS globally is 30 to 40 percent. **Objective:** To find out the knowledge, attitude, and perception of women regarding C-Section during their Antenatal period. **Methods:** The cross-sectional survey was conducted among married women. The sample size of 537 women from 18 to 35 years of age group was collected from seven districts of Karachi. A validated questionnaire is used which was comprised of demographics, and some questions related to their knowledge, perception, attitude towards their experience of CS, and views regarding Normal delivery. Data were analyzed by SPSS version 23.0. **Results:** A total of 537 reproductive women were recruited through a google doc survey. The mean age of these women was found to be 27.32±4.3 (18-35 years). Majority of participant belongs to south part 131(24.4%). Majority of participants were graduate 110(20.5%) and post graduates 122(22.7%). Almost half 55.5 % female were working women. Majority of females 235(43.5%) have their 2<sup>nd</sup> pregnancy. Most of them have 1 child (47.9%). 50.0% have history of still birth. At some level of education, knowledge is meaningful. Working women also had significant knowledge. **Conclusion:** Districts, education level, and occupational status all are directly proportional to the preference of CS in women as observed in this study.

## INTRODUCTION

In a global world, the trend of cesarean section (CS) has increased. CS is defined as a surgical opening of the abdomen used for the delivery of a baby [1]. the division of the health system is among government and private sectors worldwide. The prevalence of CS globally is 30 to 40 percent. According to WHO the prevalence of CS in Egypt is 20.9 percent, in Ethiopia at 18 percent, in Iran is 83.5 percent and according to Pakistan Demographic and Health Survey (PDHS), the rate of CS is about 14 percent to 22 percent in one usually quintuplet from 2012 to 2018 [2]. Nowadays our traditional concept regarding labor pain changed. Labor pain is described as the regular

contractions of the uterus which enhance the severity of pain and delivery of a baby that's why the majority of women change their minds about CS [3]. The first aim of the health care team is to deliver a safe and healthy baby. Women have to decide the type of delivery during their antenatal period it is a typical part of human nature that is affected by multiple factors [4]. There are many benefits for CS: chances of risk decrease, without any vaginal injury, decreases the bleeding rate, and no contraction [5]. CS is very suitable for the doctors, their team, the hospital, and also for the mother to choose the delivery date as compared to suddenly unwanted labor pain. But there are

some complications described: prolong hospital stay, expensive, rupture of the uterus, shortness of breath, premature birth of a child, excessive bleeding, complications of anesthesia, risk of wound infection, itching, and irritation in the incision of CS [6]. The inspiration to select the method of CS for women contains: uneasiness for labor, decreases pain intensity, and secures the tubal ligation [7]. It is a public-based process that includes family financial status, the environment of the clinic, the presence of machinery, and thoughts and ideas of women regarding their CS [8]. In developing countries the ratio of CS is high because the expecting women and their husbands get efficient knowledge regarding the procedures of delivery and advantages [9]. The procedure of CS is divided into elective and emergency CS. The elective procedure means it is planned surgery and the emergency section is done when there is a sudden threat to the life of the mother or the fetus [10]. Many studies showed that there are many private and socio-economic causes are anxiety, lack of care, and perceived inconsistency these all are the reason for increasing the rate of CS on a mother's request [11]. On the other hand the women who already faced CS in the previous history highly recommended the method of CS [12]. the increasing rate of CS due to more preventive attempt against labor pain. Most of the research had focused on the maternal advantages of CS although normal delivery is painful the patient gets relief earlier as compared to CS [13].

## METHODS

This was a cross-sectional survey conducted among married women from January 2022 to June 2022 throughout Karachi. We collected data from seven districts that reflected the perception, knowledge, and attitude of people related to C- Section with their respective districts by the use of the google forms online tool. The sample size of 537 was generated through openepi.com software according to the prevalence of married women population of Pakistan 50%. The sampling technique which we used in this study was purposive sampling. In our study, we include married both working and non-working parous women, age group 18 to 35 years and who are willing to participate are included in this study. Women more than 35 years, the presence of any gynecological problems like polycystic ovaries, infertility, menopausal women, women who undergo hysterectomy, and cancer in any part of the reproductive system, and females who refuse to participate in the study were excluded. We used a validated questionnaire which was comprised of demographics like age, districts, education, occupation, maternal history information and questions related to their perception and attitude towards their experience of CS, views regarding

Normal delivery. Data were analyzed through SPSS version 23.0. Means and standard deviations were reported for continuous variables. Frequencies and percentages were calculated. Chi-square and Fischer Exact test were applied to see the association between the main variables and responses at a P-value  $\leq 0.05$  level of significance.

## RESULTS

The demographic history was presented in table 1. Majority of participant belongs to south part 131(24.4%). Majority of participants were graduate 110(20.5%) and post graduates 122(22.7%). Almost half 55.5 % female were working women (Table 1).

Location	Frequency (%)
Central	80 (14.9%)
East	67 (12.5%)
Kemari	54 (10.1%)
Korangi	73 (13.6%)
Malir	54 (10.1%)
South	131 (24.4%)
West	78 (14.5%)
Education	
Graduate	110 (20.5%)
Intermediate	104 (19.4%)
Masters	101 (18.8%)
Matric	100 (18.6%)
Post Graduate	122 (22.7%)
Occupation	
House Wife	239 (44.5%)
Working Women	298 (55.5%)

**Table 1:** Demographic history of participants

Table 2 describes the antenatal details of females. Majority of females 235(43.5%) have their 2nd pregnancy. Most of them have 1 child(47.9%). 50.0% have history of still birth.

Gravidity	n(%)
First Pregnancy	84 (15.6%)
More Than Three	49 (9.1%)
Second Pregnancy	235 (43.8%)
Number Of Children (Parity)	
None	79 (14.7%)
One	257 (47.9%)
Two	152 (28.3)
Three and Above	49 (9.1%)
History Of Lost Pregnancy/ Stillbirth?	
No	268 (49.9%)
Yes	269 (50.1%)

**Table 2:** Antenatal details of Participants

Preference of planned CS versus vaginal delivery was observed 71.1% in working women and 40.2% vaginal delivery was observed in house wife with P-value 0.000. however when asking for the reason; CS allow to choose the day of birth 27.2% was notified in house wife. Furthermore asking about there any traditional belief there were 70.7% participants replied yes. What would have made your (CS)

experience better? Education on CS at antenatal clinic was replied by 48.7% working women participants as shown in Figure 1.

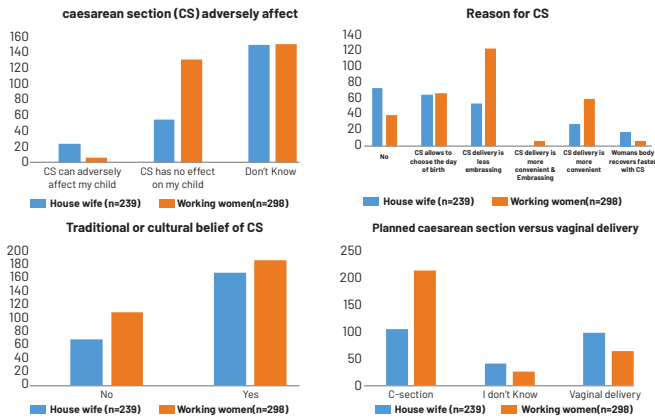


Figure 1: Occupation wise responses

## DISCUSSION

In the current study, most of the participants preferred to have CS, and less than 1/3 favored vaginal delivery. According to our study, the most common reasons for choosing CS among the population of Karachi are: CS delivery is less embarrassing and also allows choosing the day of birth. A study revealed women who were more concerned about the health status of their babies requested to have CS as a treatment of choice [14]. A comparative study conducted in Sweden regarding the choice of the mode of delivery among women reported that preferences towards the CS were due to the fear of the health of a baby [15]. According to one of the studies consideration of women towards vaginal delivery was 88% as they were thinking about maternal and fetal safety while 93% responded against the CS [16]. In our study 71.1% of working women and 43.1% of housewives are in favor of CS however 20.8% of working women and 40.2% of housewives are in favor of vaginal delivery. Another study conducted in Iran showed knowledge and preference of women regarding the CS were negatively associated [17]. The comparative study of Turkey conducted between healthcare professionals and the common public regarding the selection of delivery mode revealed that 48.1% vaginal delivery was selected by the healthcare professionals while 69.6% by the public (P=0.001)[18]. Preference and positive attitude towards CS were associated with the safety of mother and baby [19]. In the present study 68.1% of working women were thinking that those who want only one or two children are better to choose CS while 46.9% of housewives are in favor of CS in this regard. The previous study from Brazil reported that women with a high standard of living were more experienced as well as in favor of CS as compared to low status [20]. Another study from Iran

revealed the strong association of education with the choice of delivery, as they reported in their study that more preference of CS was seen in well-educated Women [21]. In our study, 72.1% of Post-graduate women choose CS as a preferred mode of delivery. With respect to the occupation status of women, it has been reported that CS were more preferred by housewives as compared to working women [22]. A study conducted in the Netherlands showed the preference for mode of delivery from experienced doctors was CS [23]. According to the study in Canada differences in the ratio of methods of delivery cannot be measured by the choices and preferences of women. This difference was likely reflected in the experience, knowledge, preference, and financial benefits of gynecologists [24]. In another study in Taiwan the frequency of CS was not related to the financial benefits of gynecologists However, the choice of delivery was strongly related to the preference of women [25].

## CONCLUSIONS

The level of education, occupational status, and different districts of Karachi can directly affect the choice of delivery among women but their level of knowledge, social status and attitude regarding this domain can increase the selection for CS deliveries.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Non-Clinical Factors Influencing Clinical Decision of Root Canal Treatment (RCT): A Survey of Patients Reasons for Avoiding RCT

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## ARTICLE INFO

## Key Words:

Root Canal Treatment, Financial Constraints, Patients Reasons, Second Opinion

## How to Cite:

Farid, H., Khan, B. ., Saad Shinwari, M. ., & Yasir, A. . (2022). Non-Clinical Factors Influencing Clinical Decision of Root Canal Treatment (RCT): A Survey of Patients Reasons for Avoiding RCT: Non-Clinical Factors Influencing Clinical Decision of RCT. Pakistan Journal of Health Sciences, 3(06). <https://doi.org/10.54393/pjhs.v3i06.340>

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Received Date: 10th November, 2022

Acceptance Date: 25th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

Root canal treatment (RCT) has high success rate, still many patients are apprehensive of this procedure. **Objective:** To determine the frequency of patients' avoiding RCT in endodontically treatable teeth and identify the reasons given by the patients to avoid RCT. **Methods:** This cross-sectional study was conducted at the department of operative dentistry at Margalla Institute of Health Sciences, Rawalpindi including patients who refused RCT in endodontically treatable teeth (n= 250). Patient's *demographics, tooth related variables* and *reason for not pursuing root canal treatment* were recorded. Descriptive statistics and Chi-Square test were run to report sample characteristics with level of significance at  $\leq 0.05$ . **Results:** Two hundred and fifty (250, 21.09%) out of 1185 patients advised for RCT refused the procedure. Majority of the participants were female (169, 67.6%). The mean age of the patients was 32.66 years (SD  $\pm$  12.313). The most common reason as reported by almost half of the patients (106, 43%) for avoiding RCT was "financial constraints" followed by a desire to take a "second opinion or advice" (46, 18%). The majority of the male participants as compared to female participants refused RCT due to financial constraints with statistically significant association ( $p < 0.001$ ). A reasonable number of female patients also identified "want second opinion/advice" as a reason for avoiding RCT ( $p < 0.001$ ). **Conclusions:** The frequency of patients avoiding RCT in endodontically treatable teeth was 21.09%. Financial constraints followed by seeking a second opinion or advice were the most common reasons identified by the patients avoiding RCT in endodontically treatable teeth.

## INTRODUCTION

One of the objective of Root Canal Treatment (RCT) is to preserve the natural dentition when affected by pulpal or periapical pathosis through debridement of necrotic and vital pulp tissue followed by obturation of root canal with clinically acceptable material [1, 2]. RCT not only prevents severance of periodontal fibers that help in proprioception but also aid in the retention of tooth that might have extracted [3]. The reported success rate of RCT is around 86-98% according to observational studies [3, 4]. A recent meta-analysis also estimated RCT success rate to be 92.6% under 'loose criteria' and 82.0% under 'strict' criteria [5]. Despite these high figures many patients are apprehensive of the Root Canal Treatment. A study

conducted in Chettin Dental College, India for five years concluded that "patient's misbelief that RCT will fail" was the major reason for avoidance of RCT [6]. Another questionnaire based survey on insight of patient's perception regarding root canal treatment showed that the "lack of awareness about RCT procedure" was the reason of avoidance of RCT and preference of extraction [3]. "Fear and anxiety" are also reported as major factors that result in avoidance of RCT and other dental treatments [7-10]. Although there are scarcity of the literature on this topic, still the existing studies recognized the fact that there is a need to create awareness among patients regarding RCT [9, 10]. In our clinical practice we have also observed a

number of patients avoiding root canal treatment in teeth with either pulpal or periapical pathosis despite the fact that teeth have good restorability and prognosis. The rationale of this study was to address patients' apprehension and negative perception regarding root canal treatment by identifying the factors that result in the avoidance of root canal treatment. The objective of this study was to determine the frequency of patients' avoiding root canal treatment in endodontically treatable teeth. The secondary objective was to identify the reasons given by patients to avoid root canal treatment.

## METHODS

Ethical approval was taken from Institutional Ethical Review Committee (ERC Ref No: DB/173/22). This cross-sectional, observational study was conducted at the department of operative dentistry in a teaching institution at Margalla Institute of Health Sciences, Rawalpindi. Sample size was determined with the help of a study conducted by Bansal and Jain in which 16% of patients preferred extraction over RCT [3]. With known population proportion of 16%, confidence level of 95% and margin of error of 5%, population size or sample turned out to be minimum of 207. Non probability, convenience sampling technique was used. The inclusion criteria was patients 18 years or above in age, refusing to undergo RCT in teeth with adequate restorative and periodontal status, in which a clinical decision of root canal treatment was made, irrespective of the clinical diagnosis. However, the patients having cognitive impairment and open apex who refuse to undergo RCT treatment were excluded. Once identified the information was collected by one of the authors in a Performa containing closed ended questions regarding patient's demographics (age, gender, and education), tooth related variables (tooth number, pain intensity, pulpal diagnosis, periapical diagnosis) and reason for not pursuing root canal treatment. The researcher choose a reason as identified by the patient. SPSS version 16.0 was used for data analysis. Descriptive statistics (mean and standard deviation for age and frequencies with percentages for demographics variables, tooth related variable and patient's reasons for refusing RCT) were run to report sample characteristics. An association between demographic (and tooth related) variables and reasons for refusing RCT was made using Chi-Square Test (Fisher exact test where cell count was less than 5). Level of significance was kept at less than or equal to 0.05

## RESULTS

During 8 months of this research a total of 1185 patients were advised Root Canal Treatment by the dentists. Out of 1185, 250 refused to undergo RCT. The frequency of patients' refusing or avoiding RCT was 21.09%. Out of 250

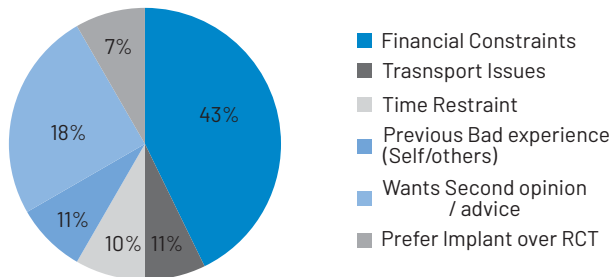
patients, 81 (32.4%) were male and 169 (67.6%) were female. The mean age of the patients who refused RCT was 32.668 years (SD  $\pm$  12.313). Majority of the patients 83 (33.2%) were having moderate pain. Mandibular left quadrant (121, 48.4%) and molar teeth (162, 64.8%) were mostly involved. Acute irreversible pulpitis (116, 46.4%) and symptomatic apical periodontitis (121, 48.4%) were most common pulpal and periapical diagnosis. A detailed description of patients' demographics and tooth related variables is presented in Table 1.

Variable	n (%) Total = 250
<b>Gender</b>	
Male	169 (67.6)
Female	81 (32.4)
<b>Age group (years)</b>	
18-28	116 (46.4)
29-39	67 (26.8)
40-50	46 (18.4)
50 and above	21 (8.4)
<b>Education</b>	
Illiterate	44 (17.6)
Matric or intermediate	164 (65.6)
Graduate	41 (16.4)
Post-graduate	1 (0.4)
<b>Tooth</b>	
Molar	162 (64.8)
Premolar	42 (16.8)
Canine	7 (2.8)
Lateral Incisor	26 (10.4)
Central incisor	13 (5.2)
<b>Quadrant</b>	
Maxillary left	40 (16.0)
Mandibular right	47 (18.7)
Mandibular left	121 (48.4)
<b>Pulpal diagnosis</b>	
Reversible pulpitis	7 (2.8)
Acute Irreversible pulpitis	116 (46.4)
Chronic irreversible pulpitis	62 (24.8)
Necrosis	46 (18.4)
Primary endodontic secondary periodontal lesion	19 (7.6)
<b>Periapical Diagnosis</b>	
Normal apical tissue	59 (23.6)
Symptomatic apical periodontitis	121 (48.4)
Asymptomatic apical periodontitis	44 (17.6)
Acute apical abscess	01 (0.4)
Chronic apical abscess	02 (10.0)
<b>Pain Intensity</b>	
No pain (0)	37 (14.8)
Mild (1-3)	46 (18.4)
Moderate (4-6)	83 (33.2)
Severe (7-9)	79 (31.6)
Unbearable/worst (10)	5 (2.0)

**Table 1:** Demographic and tooth related variables of the

participants

Most common factor or reason as reported by almost half of the patients (106, 43%) for avoiding RCT was “financial constraints”. The second most common reason identified in this research was a desire to take “second opinion or advice” before undergoing RCT which was chosen by 46 (18%) patients. Figure 1 shows the patients' reasons for avoiding RCT in a pie-chart.



**Figure 1:** Non-Clinical Factors as reported by patients for avoiding Root Canal Treatment

Majority of the male participants (47, 58%) as compared to female participants (59, 34.91%) refused for RCT due to

financial constraints with statistically significant association ( $p < 0.001$ ). Reasonable number of female patients (44, 26.03%), however, also identified the reason “want second opinion/advice” before RCT. As compare to other age groups, almost half of the patients belonging to age groups 29-39 and 40-50 years {{32, 47.76%) and (21, 45.65) respectively} identified “financial constraint” as a reason for refusing RCT with statistically significant association. A statistically significant association was also seen between pain intensity and reason for avoiding RCT. Majority of the patient with moderate pain (51.8%) identified “financial constraints” as a reason for avoiding RCT. Majority of the patients (18, 48.64%) experiencing no pain preferred to get a second opinion/advice before RCT procedure ( $p < 0.001$ ). No statistically significant association was found between tooth number, quadrant, periapical diagnosis and reasons for refusing RCT. A detailed description of statistically significant association of variables and reasons for refusing RCT is provided in table 2.

Patients' Reasons For Avoiding Root Canal Treatment (RCT)							
Variable Category (Total Number)	Financial Constraints	Transport Issues	Time Restraints	Previous Experience	Want Second Opinion/Advice	Prefer Implant Over RCT	P-Value*
<b>Gender</b>							
Male (81)	47(58.0)	7(8.64)	8(9.87)	17(20.98)	2(2.46)	0(0)	<0.001
Female (169)	59(34.91)	21(12.42)	16(9.46)	11(6.50)	44(26.03)	18(10.65)	
<b>Age group (years)</b>							
18-28 (116)	45(38.79)	8(6.89)	07(6.03)	12(10.34)	31(26.72)	13(11.20)	<0.001
29-39 (67)	32(47.76)	12(17.91)	12(1.49)	10(14.92)	01(1.49)	0(0)	
40-50 (46)	21(45.65)	07(15.21)	02(4.34)	03(4.47)	08(17.39)	05(10.86)	
50 and above (21)	8(38.09)	01(4.76)	03(14.28)	07(33.33)	06(28.57)	0(0)	
<b>Education</b>							
Illiterate (44)	22(50)	09(20.45)	07(15.90)	10(22.72)	0(0)	0(0)	<0.001
Matric orintermediate (164)	76(46.34)	10(6.09)	16(9.75)	17(10.36)	34(20.73)	11(6.70)	
Graduate (41)	07(17.07)	09(21.95)	01(2.4)	05(12.19)	12(29.2)	07(17.07)	
<b>Pain Intensity</b>							
No pain (37)	7(18.91)	8(21.62)	2(5.40)	2(5.40)	18(48.64)	0(0)	<0.001
Mild (46)	17(36.95)	10(21.73)	5(10.86)	7(15.21)	7(15.21)	0(0)	
Moderate (83)	43(51.80)	5(6.02)	10(12.04)	6(7.22)	8(9.63)	11(13.25)	
Severe/worst (84)	39(46.42)	5(5.95)	7(8.33)	13(15.47)	13(15.47)	7(8.33)	

**Table 2:** Association between demographic variable and pain intensity with patients' reasons for avoiding Root canal treatment (RCT)

\*Chisquare(Fisher exact)test

Statistical significance at  $P \leq 0.05$

## DISCUSSION

The present study was an attempt to get an insight of the patients' reasons for avoiding RCT. Although there is literature regarding patients' perception of RCT, but to our limited knowledge there is scarcity of the literature on the patients' reasons for avoiding RCT [5, 6, 10]. Most common reason as identified by the present study is “financial constraints”. Financial status of the patient is an important

non-clinical factor that can effect decision to retain or extract the tooth regardless of the clinical condition of the tooth. Studies conducted around the globe also concluded that an important barrier to obtain dental care is cost of the treatment [11-13]. A survey conducted in United States from 2013-2016 reported that 15 % of the population in need of dental care didn't get or obtain it [13,14]. Top three

barriers identified in this survey were all related to financial reasons like "could not afford the cost," "insurance did not cover procedures," and "did not want to spend the money". Non-financial barriers like "afraid of dental treatment" and "busy routine" were less cited reasons. However, our result is in contrast to Sadasiva et al., study conducted in India where "cost" was the fourth most common reason for avoidance of the RCT and perception that RCT is a failure treatment was the most common reason for avoidance of RCT [6]. In our study previous bad experience of self or others was third most common reason for avoiding RCT. Extracting the tooth and replacing it with prosthesis whether fixed or removable was an expensive option with patients sometimes not aware of the cost of the replacement prosthesis. Proper counselling and explaining the importance of natural tooth. Sayed et al., studied that cost of the future treatment may help in scenarios where patient is preferring a replacement prosthesis instead of RCT of clinically salvageable teeth [15]. The second most common reason identified in this study was "wants second opinion/advice". Twenty six (26 %) percent female identified this factor as a reason for avoiding RCT whereas only 2% of male patients identified this reason. In developing countries socio-cultural structure and financial dependency limits women's decision making power regarding their own health and lives [16]. This may be a possible reason for female identifying "wants second opinion/advice" before agreeing for RCT. In National Health and Nutritional Examination Survey (NHANES) conducted in 2013-2014 and 2015-2016 a similar reason identified for not seeking dental care was "another dentist recommend not doing the procedure" [17]. This survey however recorded the information regarding not seeking dental care in general and not specific to RCT. Secondly no discrimination of the respondents reasons according to gender was made. Least cited yet thought-provoking reason identified in our study was "preference of implant over RCT". Although only 7% of the patients identified this reason but extraction and placement of implant instead of RCT in a tooth with adequate restorative and periodontal status is a great concern. Parirokh et al., many patients and dentists think that implant may offer better results and this trend is increasing among both dentists and patients [17, 18]. Till date, not a single non-biased evidence based study has shown that extraction and placement of implant is preferential over RCT [19, 20]. Although the present study probes the reasons of patients not seeking RCT in endodontically treatable teeth. Still data collection from a single center was a limitation of this study.

## CONCLUSIONS

The frequency of patients' avoiding RCT in endodontically

treatable teeth was 21.09%. Financial constraints followed by seeking second opinion or advice were the most common reasons identified in this study by the patients avoiding RCT in endodontically treatable teeth.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Presbyphonia: Quality of Life Following Voice Therapy Intervention

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## ARTICLE INFO

**Key Words:**

Presbyphonia, Prebylarynx, V-RQOL

**How to Cite:**Imtiaz, R. ., Ashraf, A. ., Bari, S. ., Liaquat, M. ., & Ijaz, M. . (2022). Presbyphonia: Quality of life following voice therapy intervention: Presbyphonia Through Voice Therapy Intervention. *Pakistan Journal of Health Sciences*, 3(06).<https://doi.org/10.54393/pjhs.v3i06.351>**\*Corresponding Author:**

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Received Date: 11th November, 2022

Acceptance Date: 25th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

The deterioration of respiratory capacity that comes with aging exacerbates the consequences of presbyphonia. Diaphragmatic breathing is to improve the usage of respiratory muscles enough to cause respiratory and phonatory alterations. **Objectives:** To determine the effectiveness of voice therapy intervention in terms of improved quality of life for those with presbyphonia. **Methods:** The interventional study, a non-probability convenience sampling method was used to select 10 participants with presbyphonia identified by ENT, otolaryngologist to a SLP for either vocal function exercises or phonation resistance training exercises in order to improve their quality of life following a three-week course of twice-weekly therapy. Through the (V-RQOL) protocol the studies was used to evaluate the quality of life in presbyphonia before and after voice treatment. **Results:** Total 10 individuals were divided in 3 age groups majority 5 were in 51-60 age, 2 in 40-50 age among them 60% males and 40% females. The effect of treatment before and after intervention showed statistical significance difference (P-value = 0.001) which present significant improvement in quality of life in presbyphonia. **Conclusions:** According to preliminary evidence, patients with presbyphonia may benefit most by voice interventions and enhance subglottal pressure management, increase airflow, and improve patients' quality of life. Better results in terms of self-evaluation for phonation.

## INTRODUCTION

In the United States, there are 41.5 million older individuals who are over 65. The number of senior people in the US is expected to nearly quadruple by 2030 and account for over 20% of the country's population. It is generally known that the subsystems that support voice production undergo a number of age-related changes, including alterations in respiration, phonation, and resonance. These aging-related changes and/or deteriorating health in certain senior people are enough to lead to vocal abnormalities that impair communication and have a detrimental impact on quality of life [1]. Approximately 10% of the general population and 50% of voice specialists report having voice abnormalities. Although both adults and children are

impacted, the causes vary depending on the age groups [2]. Presbyphonia is characterized as a series of physiological occurrences linked to the ageing process of the vocal folds. It comprises a variety of larynx-related morphological, endoscopic, and vocal acoustic alterations that are brought on by age. Mucous membranes, cartilage, intrinsic and extrinsic muscle mass, as well as a neurological and functional deficiency, are all affected by this process [3]. The clinical condition linked to presbylarynx is known as presbyphonia. Vocal problems can occur in between 12% and 35% of adults over the age of 65. Presbyphonia is the most typical cause of dysphonia in this group with a diagnosis of presbyphonia made in one-

fourth of the cases [4]. The high prevalence of voice abnormalities in older individuals is caused by a number of etiologies. One diagnosis for vocal issues linked to aging-related physiological changes is presbyphonia [5]. All voice production subsystems may be affected by these modifications. Communication is hampered by voice issues, which also lower quality of life [6]. The vocal fold's resistance to the driving pressure from the lungs causes them to push away from one another, starting the vibratory process. The lung-thorax unit's pressures have a role in loudness and pitch modifications as well [7]. Presbyphonia describes the signs of an ageing voice, whereas presbylarynx describes the structural changes that occur with ageing to the larynx. Due to the lack of a universally accepted definition of presbyphonia and the fact that age-related laryngeal changes are generally non-specific, a variety of features are typically used [8]. Age related structural changes in the larynx lead to vocal impairments (presbylarynx). Both the endolaryngeal soft tissues and the ectolaryngeal skeleton are affected by these changes (particularly the vocal folds). When there is a shortage of air, the vocalis muscle atrophies and becomes hypotonic, which is clinically evident as vocal fold bending and a glottic chink in the shape of a spindle [9]. Additionally, the respiratory muscles are crucial for controlling airflow because they work to offset the lungs' recoil pressures during the expiratory phase of speaking [10]. It's crucial to rule out any alternative diagnoses, such as social isolation, anxiety, and depression, before a presbyphonia diagnosis is confirmed. It may also coexist with other vocal diagnoses like benign vocal fold lesions, chronic inflammatory laryngitis, acute inflammatory laryngitis, muscle tension disorders, neurologic disorders, vocal malignancies, vocal fold [11, 12]. Patients with presbyphonia frequently self-report changes in voice quality, difficulty speaking, and increased fatigue in addition to clinician-assessed measures [13, 14]. With ageing, the phonation-related systems undergo significant physiological changes. Vocal tremor, vocal fold bending, prominence of the vocal processes, partial glottic closure, reduced phase and amplitude symmetry, and shrinking and weakening of the vocal folds are all possible effects of this [15]. Since the 1930s, when the first books on voice therapy were published, several books have proposed a wide range of therapeutic modalities for voice control. From these articles, a variety of philosophical perspectives on the therapy of voice problems have emerged [16, 17]. The goals of a program for physiologic voice management include modifying and improving the laryngeal muscles' strength, tone, balance, and endurance; improving the coordination between laryngeal muscle effort, respiratory effort and control, and supraglottic laryngeal tone modification; and

establishing a sound vocal fold cover [18, 19]. Aged voices tend to be weak, breathy, and strained. Reduced loudness, erratic hoarseness, lower pitch for females, higher pitch for men, greater vocal effort, and vocal tiredness are among the vocal symptoms [20]. As a result, it is believed that age-related systemic and structural changes all contribute to the ageing voice and deteriorating vocal quality [21]. Most persons over 40 years old can see some presbylaryngis symptoms, although many would deny having any voice issues [22]. An investigation into presbylaryngis and pathologic presbyphonia was started. We proposed that pathologic presbyphonia would result from the interaction of certain social, anatomical, and auditory elements with presbylaryngis [23]. Presbyphonia expert voice treatment is highly gratifying, and it is best delivered by a team that includes a doctor, a speech-language pathologist, and usually a voice expert. Along with voice treatment, the voice's wellspring of power, Direct voice therapy approach that incorporates vocal function exercises (VFE) and the phonation resistance training exercise (PhoRTE) method [24]. The study's purpose was to assess individuals with presbyphonia or prebylarynx, whose quality of life was affected in a number of different ways. This study concentrating on voice interventions that enhanced communication abilities, reduce emotional symptoms, and assist people with various voice techniques in their daily lives as a consequence.

## METHODS

The interventional study was conducted at Sehat Medical Complex hospital located in Lahore. Data was conducted in span of 6 months. The study population consists of n=10 patients diagnosed with Presbyphonia that refer by ENT specialist or otolaryngologists by Non-Probability Convenience sampling and from both gender with age of 40-70 visit at SMC hospital. A trained research team member will be responsible for recruiting patients. The informed consent will be sought on the day of their initial appointment. Before beginning VFE and PHoRTE therapy, the informed consent procedure will take place in a private room. If they agree, the participants will be randomly assigned to one of the research arms. For Exercises for vocal function in the following four steps that include warm-up, stretching, contraction, power workouts that proceed. The exercises should be performed twice consecutively with the utmost softness, ease of initiation, and forward placement of tone. The four exercises for PhoRTE Keep the vowel /a/ in place with a loud, use a loud, energetic voice to glide on the vowel /a/ across the full pitch range, from low to high and from high to low. Shout useful words in a high-pitched voice. By repeating the same words and phrases, you may project a commanding voice with a



low tone. The data collection performa was used in order to evaluate quality of life in presbyphonia after voice therapy intervention through the voice related quality of life V-RQOL. Session was conducted thrice a week and duration of session was 45 min. The data were organized and SPSS 25.0(Statistical Package for Social Studies)was used for statistical analysis. The paired sample t-test was used to find out the before and after difference in QOL among patients. P-value <0.05 was considered as significant.

## RESULTS

Total sample consider of 10 individuals were divided in 3 groups of age majority 5 were in 51-60 age, 2 in 40-50age among them 60% males and 40% females. Participants in this study came from a variety of occupations, each of which had an impact on their quality of life. The participant works as a businessman, a housewife, a builder, and a teacher. Minority of the participants were housewives (3 of them, 40%), businessmen (3 of them, 30%), teachers (2 of them, 20%), and builders (1 of them, 10). The frequency and percentage was carried out of demographics variables table 1.

Variable	N (%)
<b>Age</b>	
40-50 yrs	2(20%)
51-60yr	5(50%)
61-70yr	3(30%)
<b>Gender</b>	
Male	6(60%)
Female	4(40%)
<b>Occupation</b>	
Business man	3(30%)
House wife	4(40%)
School teacher	2(20%)
Builders	1(10%)

**Table 1:** Show frequency and percentage of demographic variables.

According to table 2 the result of this study the mean and standard deviation of pretest was (M=3.1000 ± SD=4.50802) the pretest mean standard deviation of pretest reading and the mean and standard deviation of posttest showed (M=22.6000 ± SD=3.80643) After compering the statistics of pretest and posttest through paired t-test the analysis showed statistical significance in the result that indicated by p value 0.001 < 0.05 (5%) which indicating rejecting null hypothesis and accepting alternative hypothesis that showed significant improvement in quality of life in presbyphonia after following voice intervention.

Paired Samples Statistics			
	N	Mean ± SD	P-Value
Pretest	10	33.1 ± 4.50	0.001
Posttest	10	22.6 ± 3.83	

**Table 2:** Pre-post comparison of Qol among patients

After the analysis of pretest and posttest according to standardize tool V-RQOL. In the table 3 the subject with presbyphonia demonstrated a poor quality of life throughout the pretest. After the following VFE and PhoRTE in session's period participant with presbyphonia showed very good improvement in their quality of life.

Variable	Frequency	
Categorical View of Pre and Post Treatment		
Quality of Life	Pre Test	Post Test
Very good	0(0%)	5(50%)
Good	1(10%)	1(10%)
Fair	1(10%)	4(40%)
Poor	8(80%)	0(0%)

**Table 3:** Comparison of improved quality of life among patients

## DISCUSSION

Improved respiratory function would result in better voice results, which was the main justification for include respiratory muscle and phonatory in voice treatment. Because there was few research on the vocal results from breathing exercises and presbyphonia at the time of this trial, the mechanism underlying this notion remained unknown. According to Siqueira et al., that in order to improve understanding of the mechanism of action, future research identify the independent variable is a respiratory training and report a wide variety of voice and respiratory outcomes [25]. All but one of the voice treatments considered showed that at least one outcome measure might improve statistically as a result of voice therapy. Desjardins et al., and all of the publications favored using voice treatment as the main strategy [26]. Along with the conclusions reported, this research looked at the population's compliance with home treatment recommendations. According to Tay et al., study conducted, both VFE and PhoRTE participants seemed to start practicing their program on a regular basis [27]. According to Angadi et al., who conducted two independent reviewers searched for outcome studies that employed VFEs as an intervention. VFEs are effective in boosting vocal function in people with normal and disordered voices, presbylaryngeus, and professional voice users, according to outcome studies [28]. The efficacy of remedies that help the ageing voice has been the subject of several vocal researches. The vocal parameters and quality of life of the elderly people provided evidence of the benefits of the suggested treatment. The findings of the self-assessment showed improvement

from before to after treatment, supporting evidence from earlier research that show improved voice-related quality of life following speech therapy in the elderly. In contrast of Hartnich et al., and Gampel et al., noted that the improvement in this study was more pronounced in conditions connected to the physical element of presbyphonia, which have previously been characterized to have the greatest effects on older people's quality of life [29, 30]. According to this study only three weeks after the end of the treatment was observed, a socio-emotional improvement was noted. It is important to keep in mind that this was the time when the patients had the chance to engage in more communication scenarios and were therefore better able to gauge the improvement in vocal performance as well as its emotional impact on social activities. The senior population has a strong urge to communicate, but they also tend to negatively characterize their voice quality and experience emotional effects from this connection, making improvement in regard to socio-emotional elements following therapy significant. Thus, it is crucial to talk about the necessity for regular follow-up with these patients in order to check on how they are carrying out their home exercises.

## CONCLUSIONS

The real improvements in self-assessment results came from voice therapy, which included vocal function exercises and phonatory resistance training exercises as a result of a balance between both the vocal folds' capacity and the resulting respiratory flow to produce an acceptable amount of resistance to adjust the airflow. Difference was found in the V-RQOL protocol results between the participants, with consistent improvement immediately after therapy. These approaches allow for enhancement of vocal strength, projection, and expression of emotion and reduce the anxiety or depression among the population that diagnosed by presbyphonia. Benefits extend to improved patient confidence, increased vocal authority, and ultimately enhanced communication skills in them.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Prevalence of Antibodies to Hepatitis B Core Antigen in Hepatitis B Surface Antigen Negative Healthy Blood Donors

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## ARTICLE INFO

## Key Words:

Core Antibody, Hepatitis B Virus, Blood Donors

## How to Cite:

Aijaz, R. ., Siddiqui, H. ., Soomro, A. ., Kanwal, M., Hussain, W. ., & Khalique, S. . (2022). Prevalence of Antibodies to Hepatitis B Core Antigen in Hepatitis B Surface Antigen Negative Healthy Blood Donors: Prevalence of Antibodies to Hepatitis B Core Antigen. *Pakistan Journal of Health Sciences*, 3(06). <https://doi.org/10.54393/pjhs.v3i06.360>

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Received Date: 15th November, 2022

Acceptance Date: 25th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

The screening of HBsAg has been the cornerstone in HBV research in various states and has greatly decreased but not eradicated TAHBV. Anti-HBc was supposed to be a good indicator of latent HBV infection in the window after HBsAg disappeared. **Objective:** To determine the prevalence of hepatitis B core antibodies in hepatitis B negative surface antigen healthy blood donors. **Methods:** This Cross-sectional study was held in the Medical Ward 7 of Jinnah Postgraduate Medical Center, Karachi from July 17, 2020 - January 16, 2021. A total of 147 healthy blood donors of both sexes, aged 17 to 65 years, who submitted an application for blood donation, were selected. The venous blood (5 ml) was gathered using aseptic technique. For 5 mins; Sera was centrifuged at 3000 rpm and separated. For the qualitative and quantitative detection of anti-HBc IgM, an ELISA test by DIA was performed. **Results:** Of the 147 patients, 81 (55.10%) were male, 66 (44.90%) were females with a M: F ratio of 1.3: 1. In this study; the patients age range was 17-65 years with  $41.45 \pm 8.97$  years of mean age. The pervasiveness of anti-hepatitis B antibodies in healthy donors of blood who have negative surface antigen of hepatitis B virus was 6.12%. **Conclusions:** It was found that the pervasiveness of anti-hepatitis B antibodies in healthy donors of blood who have negative surface antigen of hepatitis B virus was 6.12%.

## INTRODUCTION

Hepatitis B virus (HBV) infection results in chronic, acute and occasionally latent infection. HBV has varying rates of endemicity around the globe [1, 2]. The incidence of latent hepatitis B depends on the different endemic HBV infection in the peoples studied, the different samples (liver or serum samples), and the different tests performed to detect HBV DNA [3]. Transfusion-related hepatitis B virus (TAHBV) infection remains a serious issue in underdeveloped regions, even with the implementation of compulsory HBsAg detection tests by ELISA [4]. Blood transfusions are common when this virus is transmitted. The close interpersonal contact with body fluids and blood, sexual contact and intravenous drug use causes transmission from mother to child are other modes of transmission. HBsAg is a blood marker for HBV infection

diagnosis [5]. Current HBV infections or previous HBV infections are routinely tested in blood banks for HBsAg [6]. The (HBsAg) screening in the donors of blood has substantially condensed the post-transfusion hepatitis B incidence. In HBsAg negative patients, HBV DNA is identified in the blood or patients' liver tissue with or without HBV antibodies called occult HBV infection [7]. Another important factor in preventing PTH in the past has been the adoption of antibody testing called anti-hepatitis B (anti-HBc). It may also be helpful in preventing infection of hepatitis B virus (HBV) spread by various negative blood HBsAg-donors [8]. Anti-HBc was supposed to be a good indicator of latent HBV infection in the window afterwards the HBsAg disappeared. The recent infection is supposed if first class of IgM showed HBc, while during infection in later

stages anti-HBc IgG appears and indicates previous HBV infection [9, 10]. A study was conducted by Karimi et al. Anti-HBc antibodies were found in 4.9% of HBsAg negative blood donors [11]. Anti-HBc was found in 17.2% of HBsAg negative healthy blood donors [12]. The purpose of this study was to determine the prevalence of hepatitis B core antibodies in hepatitis B negative surface antigen healthy blood donors.

## METHODS

A total of 147 healthy blood donors of both sexes, aged 17 to 65 years, who submitted an application for blood donation were selected by non-probability convenient sampling technique. The following simple formula was used to calculate the appropriate sample size for a prevalence study;  $n = Z^2 P(1 - P)/d^2$ . Where n is the sample size, Z is the confidence level statistic. A solid phase enzyme-linked immunosorbent assay (ELISA) based on the "sandwich" principle using microtiter plates has been developed for the detection of hepatitis B surface antigen (HBsAg). The detection level was less than or equal to 5-10 ng HBsAg/ml. HBsAg-positive patients with a history of HCV, syphilis, or HIV were omitted. The analysis was conducted after CPSP approval and the Ethics Review Committee of Jinnah Graduate Medical Center in Karachi. All participants gave the informed consent after a detailed clarification of the benefits, and samples were collected who agreed to participate. The demographic features like age, sex, and marital status were recorded. The venous blood (5 ml) was gathered using aseptic technique. At room temperature; blood was permitted to retract and clot. For 5 minutes; Sera was centrifuged at 3000 rpm and separated. For the quantitative and qualitative determination of anti-HBc IgM, ELISA was performed with DIA PRO HBc IgM test kits (Diagnostics Bioprobes, Milan, Italy) following the manufacturer's instructions. Conferring to the manufacturer's user manual, the specificity and sensitivity of the test method are 99% and 98% correspondingly. Additional serological tests were accomplished with enzyme immunoassay to detect other HBV markers (HBsAg; Anti HBs) and HCV antibodies. Its lower levels were evaluated by the calorimetric method of Frankel and Reitman. All data collected was recorded on pre-designed structured forms. Information about each participant is confidential and available only to an authorized person. Data were analyzed by means of SPSS 20.0. The variables which are continuous expressed as mean  $\pm$  SD. Qualitative variables such as gender, blood donor type, and presence / absence of anti-HBc antibodies are presented as frequency and percentage. Modifiers such as age, sex, and blood donor type were managed by stratification. A chi-square post-stratification test was used to determine the relationship of these modifiers with the presence/absence

of anti-HBc antibodies. Less than 0.05 P-value was taken as significant.

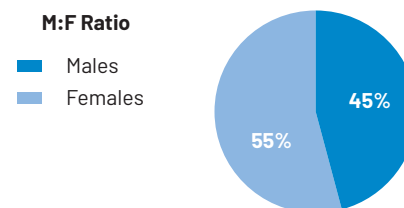
## RESULTS

In this study; the patients age range was 17-65 years with  $41.45 \pm 8.97$  years of mean age. Eighty-two (55.78%) patients were between 17 and 40 years of age (Table 1).

Age (in years)	No. of Patients
17-40	82(55.78%)
41-65	65(44.22%)
Total	147(100.0%)
Mean $\pm$ SD	41.45 $\pm$ 8.97 years

**Table 1:** Distribution of patients according to Age (n=147)

Of the 147 patients, 81 (55.10%) were male and 66 (44.90%) were females with M: F ratio 1.3: 1 as shown in figure 1.



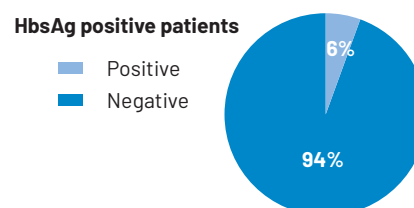
**Figure 1:** Gender distribution of patients

Patient distribution by blood donor type is shown in Table 2.

Type of Blood Donors	Frequency (%)
A	39(26.53%)
B	60(40.82%)
O	36(24.49%)
AB	12(8.16%)

**Table 2:** Distribution of patients according to type of blood donors (n=147)

In our study, the pervasiveness of hepatitis B antibodies in healthy blood donors with a negative hepatitis B surface antigen was found in 09 (6.12%) patients (Figure 2).



**Figure 2:** Prevalence of patients with hepatitis B antibodies in healthy blood donors with a negative hepatitis B surface antigen.

The stratification of the core anti-Hep B antibody by age and sex is shown in Tables 3 and 4, respectively and is statistically significant with P-value of 0.989.

Age (years)	Anti Hep B Core Antibody		p-value
	Present	Absent	
17-40	05	77	0.989
41-65	04	61	

**Table 3:** Stratification of anti Hep B core antibody with respect to age groups.

Gender	Anti Hep B Core Antibody		p-value
	Present	Absent	
Male	05	76	0.977
Female	04	62	

**Table 4:** Stratification of anti Hep B core antibody with respect to gender

## DISCUSSION

Even after hepatitis B surface antigen (HBsAg) recognition by enzyme-linked immunosorbent assay became necessary, transfusion-related hepatitis B virus (TAHBV) infection remained a severe issue in underdeveloped nations (ELISA) [13]. Most under-developed nations have high rates of hepatitis B virus (HBV) infection, particularly in rural regions. The high costs of management, treatment and prevention add to this burden. Blood transfusions are a typical way for this virus to spread [14]. Other means of transmission are through sexual activity, intravenous drug user (IVDU), close interpersonal contact (vertical contact) and risky conventional procedures such ear piercing, tattooing, traditional uvulectomy and circumcision. A diagnostic indicator of HBV infection is the existence of HBsAg in the blood [15, 16]. Blood banks do regularly test for HBsAg to find HBV infection, either present or past. When a patient has neither HBsAg nor HBV antibodies, latent HBV infection is definite as the HBV DNA presence in the blood or liver tissues of the patient [17]. Therefore, the absenteeism of HBsAg in the blood of persons who appear to be in good health points to lack of circulation. Without detectable HBsAg, HBV and anti-HBc antibodies may be infectious [18]. The risk of TAHBV is based on a window phase of the disease that depicts the disease's carrier state. The anti-HBc detection in window phase is a helpful serological indicator of hepatitis B infection at this time [19]. Anti-HBc IgG class appears later and implies prior HBV infection, whereas anti-HBc IgM class occurs first and indicates a recent infection. The mainstay of HBV screening in many countries has been the practice of anti-HBc and HBsAg screening, which has greatly decreased but not completely eradicated TAHBV [20]. In the window phase after HBsAg eradication, anti-HBc has been demonstrated to be a very good indicator of latent infection with HBV. Between 500,000-1.2 million individuals died from infection of HBV and it's increasing each year, making it the ninth most prevalent cause of death worldwide [21]. Cirrhosis, liver failure, or hepatocellular cancer will appear in 15% to 40% of infected people. In Nigeria, HBV infection is regarded as hyperendemic; the HBsAg prevalence in the adult people ranges from 6% to 27% [22]. Nigeria which is an emerging state with a high poverty level, cannot pay to analyse the DNA of all blood units drawn in spite of the fact that this is the only way to attain 100% results [23]. In our investigation, 09 (6.12%) patients had anti-hepatitis B

antibodies, which were common in healthy blood donors with a negative hepatitis B surface antigen. Karimi et al exhibited that 4.9% of HBsAg-negative blood donors tested positive for anti-HBc. Abdelaziz et al and others stated that 17.2% of healthy donors of blood who tested negative for HBsAg also have anti-HBc [24]. Gish, and Locarnini found a 2.1% incidence but no HBV DNA was detected. Anti-HBc as the only marker in a serological pattern is not unusual [25]. There are significant discrepancies between the findings of similar studies conducted in different countries on the pervasiveness of HBV-DNA in HBsAg- and anti-HBc-positive blood donors [26]. Turkey and Greece have a frequency of 0%, Saudi Arabia of 1.25%, Germany of 1.59%, Italy of 4.86%, India of 7.5%, Egypt of 17.2%, Japan of 38%, and Sudan of 90.5% [27-30]. The first study was conducted in the Tripoli region (500 blood donors) in 2014, the anti-HBc rate was 143(9.8%), and the second study was carried out in 2015 (1,256 donors) from the Northwest region of Libya [31]. (Including Tripoli and its vicinity), the anti-HBc frequency was 10.5%. However, our discovery was quite low compared to another study of 200 blood donors at the blood bank of Tripoli Central Hospital in 2009; This "frequency" difference may be due to the small sample size [32]. In contrast, the anti-HBc rate in this study is high compared to that found in a 2015 study (979 blood donors) in the north-central region of Libya (Misurata and neighboring cities).

## CONCLUSIONS

In this study, it was found that the pervasiveness of anti-hepatitis B antibodies in healthy donors of blood who have negative surface antigen of hepatitis B virus was 6.12%. Therefore, we recommend routine testing of anti-Hep B core antibodies in healthy blood donors negative for hepatitis B surface antigen to detect hepatitis B infection in donors of blood.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Prevalence of Low Back Pain and Its Intensity Among Teachers of Universities in Lahore

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## ARTICLE INFO

## Key Words:

Low Back Pain, Intensity, Universities

## How to Cite:

Mushtaq, M. ., Qamar, S. ., Rafiq, S. ., Zia, S. Z., Mohiuddin, M. ., Ghafoor, A. ., Saeed, M. ., & Iqbal, S. . (2022). Prevalence of Low Back Pain and Its Intensity Among Teachers of Universities in Lahore: Prevalence of Low Back Pain and Its Intensity Among Teachers. *Pakistan Journal of Health Sciences*, 3(06). <https://doi.org/10.54393/pjhs.v3i06.309>

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Received Date: 1<sup>st</sup> November, 2022Acceptance Date: 15<sup>th</sup> November, 2022Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

Back pain (BP) is one of the most debilitating conditions inflicting grief, discomfort, and disability to its bearer. Teachers are more at risk of having low back. As teaching requires such activities like long standing and sitting as occupational demand so making this profession more prone to develop low back pain. **Objectives:** To check the prevalence and intensity of low back pain in the teachers of universities in Lahore. **Methods:** This study was based on cross-sectional research. Total 261 participants were included in the study with systematic random sampling technique, and collection of the data is done by using an authentic scale "Owestery Disability Scale". SPSS version 21.0 was used and frequency charts and bar charts are used. **Results:** Low back pain prevalence in university teachers is 56% and 44% participants were having no pain. Most of the teachers having pain were in age range of 31 to 40 years, 52.5% were females and 47.5% were male. Most of the participants who were having low back pain experienced mild pain which constitute about 86% of total respondents with low back pain. Moderate pain was experienced by 24% participants. Only 6% teachers from the sample size felt severe pain. **Conclusion:** There was a significant prevalence of low back pain in teachers of universities in Lahore. The intensity of pain varied from mild to severe and most of the teachers experienced mild low back pain.

## INTRODUCTION

Pain at low back (LBP) is defined as pain from the region of 12th rib to the region of inferior gluteal folds, with or without leg pain [1]. Globally it is one of the most frequently presented musculoskeletal issue that is related to poor mechanics of body, posture and improperly bending forward [2]. As back is responsible for supporting much of the body weight and it also plays an important role in carrying out the body movements. So, when there is any damage or trauma to these structures like ligaments, bones or muscles can be easily identified in erect standing position [3]. Now a days doing therapeutic exercise is

considered very important in case of low back pain, it is basically a physical activity which is repeated and planned and aims to enhance fitness of low back [4]. There are various clinical presentations of low back pain and include, pain at lumber region which is dull and diffuse in character, it may radiate to both or one lower extremity and restricted range of motion [5]. Many factors are associated with low back pain and several occupations like teaching profession which require prolong sitting and standing as well as poor postures are considered as risk factor for developing the pain [6]. When the pain lasts for more than three months it

comes under the category of chronic low back pain. Chronic low back pain has many detrimental effects on the life of the patient as it may affect his sleep, working efficiency and socialization as well as mental health [7]. Back pain that is due to some underlying pathology is termed as specific LBP, it may be due to disc pathology, spinal canal pathology, osteoporosis or fractures. It is also known as non-mechanical LBP [8]. Nonspecific low back pain is defined under the definition provided by National Institution for Health and Care Excellence (NICE), any pain due to muscle soreness, stiffness and without any underlying pathology or specific cause, at the level of low back [9]. One of the common reason of LBP is lumber lordosis, it is increased lumber curve and responsible for increased shearing and compression between the vertebrae and can lead to muscle strain and disc herniation [10]. Furthermore, causes of work related LBP are basically physical. WHO recommends that physical activity has a vital role in person's health and wellbeing, 30 minutes of physical activity daily is important for improving quality of life is suggested by world health organization [11]. There are wide variety for LBP interventions such that, medications, behavioral therapy, physiotherapy and educating about postures and physical exercises. Now a day literature supports exercise therapy for chronic non-specific LBP [12]. Non pharmacologic treatment is now considered as effective and better choice of treatment. Chronic low back pain is better treated with exercise therapy as compared to NSAIDs and painkillers. In addition to these there is less evidence supporting which exercise protocol is better as compared to other available exercises [13]. The objective of this study was to explore the prevalence of low back pain and its intensity in teachers of universities in Lahore. The study only conducted in 3 specific universities of Lahore. Lahore is a big city of Pakistan and there are many private and public sector universities, where the academic life and ergonomic health related problems of faculties are often ignored and this study provides a little glance towards this essential matter at institutional level.

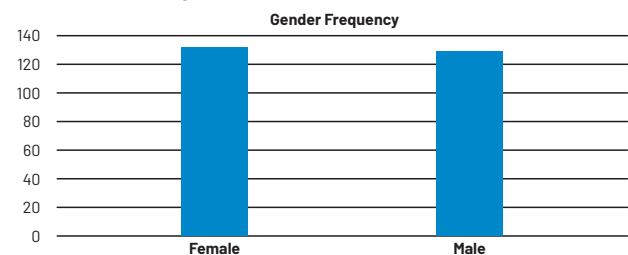
## METHODS

This study was cross-sectional research held on university teaching faculty of three universities of Lahore. Simple random sampling technique was utilised and three universities were randomly selected and a sample of 261 participants was obtained. Sample size was determined by sample size calculator (<https://www.calculator.net/sample-size-calculator.html>). It was a survey based study at University of Management and Technology Lahore, Punjab University Lahore and University of Central Punjab Lahore. The population comprised of teachers in our selected universities, the target of our sample size was 261

participants. The age range of participant was between 18 to 60 years. Administrative staff and teachers who had experience less than 1 year excluded from study. The questionnaire we used to obtain data was oldest and most reliable for low back pain, Oswestry Low Back Pain Disability Questionnaire (ODI). It is designed for assessment of functional and disability status. Basically ODI is a 60 item questionnaire but we only focused on occurrence and intensity of pain. The study design of this study is cross-sectional, such type of study does not require any follow up and frequency can be determined through this type of study. A cross sectional study is a type of research study which provides the clear picture of the occurrence and pattern of a disease in a given inhabitants at a specific point in time. The study was held at three universities of Lahore (UMT, PU and UCP) and the analysis of data was done SPSS version 21.0 Descriptive analysis of the data was done for variables in the study by means of statistical measurement. Rate of recurrence graphs, tables, proportions, standard deviations and means were used. Non probability or convenient sampling was used. A convenience sample is a group of people who are easily approached by researcher and available for study.

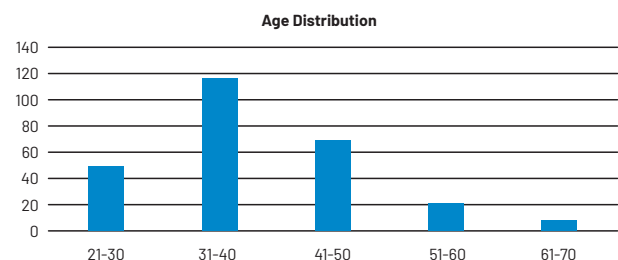
## RESULTS

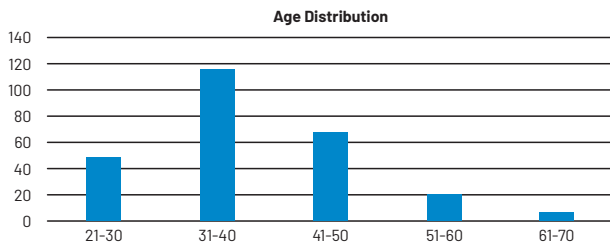
Both male and females participated in the study 131 females and 130 males (Figure 1).



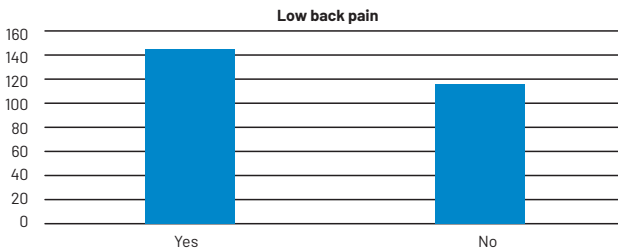
**Figure 1:** showing both gender responded equally in the study and gender biasness is avoided

Most of the participants were young adults and lie in 31-40 years of age. Regarding prevalence of the low back pain out of 261, 145 participants (56%) participants were having low back pain. The respondents with low back pain were having pain intensity that range from mild to severe low back pain. While 116(44%) participants were having no pain. Age distribution and low back pain is shown in figure 2 and 3.





**Figure 2:** Showing age sets of the participants and most of the participants comes under the age group of 31-40 years



**Figure 3:** showing prevalence of the low back pain

The intensity of low back pain among teachers of universities is shown in table 2. According to pain intensity as it is evident from the above chart that most of the participants who were having low back pain experienced mild pain which constitute about 33% of the total respondents with low back pain. Moderate pain was experienced by 13% participants. Only 4% teachers from the sample size felt severe pain.

Pain Intensity	Frequency	Percent
No pain	116	44.4
Mild pain	87	33.3
Moderate pain	35	13.4
Severe	9	3.4
Very severe	8	3.1
Worst pain	6	2.3
Total	261	100.0

**Table 2:** Frequency of low back pain intensity among university teachers.

## DISCUSSION

The central point of our research work was to detect the prevalence of pain at low back in teachers of universities and to identify the level of intensity of that pain at the level of low back. The results of our research showed that there is 56% prevalence rate of LBP. Aregawi et.al., conducted a study on low back pain and associated factors in teachers and came up with the conclusion that low back prevalence was high among the teachers and occupational activities like prolong standing and sitting was considered the possible risk factors for high prevalence of low back pain [14]. Similarly, in our study prevalence of low back was high among university teachers. Swatisuman et.al., held a cross sectional study on secondary school teachers and concluded that there was significant prevalence of low back in the teachers and supported the results if this

current study [15]. A study conducted by Nirav et.al., on musculoskeletal disorders of school teachers and found that a high prevalence of musculoskeletal pain in the shoulder, knee, and back [16]. A 2019 study concluded that there is a prevalence of LBP in 64% teachers of primary school in Kenya, whereas in our study it came out to be 56% that indicates teaching profession is associated with low back pain [17]. Another study done on muscular pain at various anatomical sites in secondary school teachers and concluded that there is high prevalence of low back pain in teachers and this pain is associated with working conditions of the teachers and ergonomics [18]. Saikou et.al., done a study on association of risk factors with prevalence of low back pain on university teachers and came up with the results that there is a significantly high prevalence of low back pain in university staff and risk factors may include physical inactivity [19]. However, in our study there is also a high prevalence rate of low back pain in universities of Lahore. Another study also done in 2019 on teachers and different factors affecting their health concluded that psychological health also affects physical health. So, low back pain is also associated with depression of the teaching faculty [20]. In 2021 a study was done on female teachers and was amid on not only prevalence but also on the level of intensity of that pain. The study was done on 782 female teachers and physical inactivity was related to it. After analysis of results the conclusion that came was there is high prevalence and positive relation between physical inactivity and back pain [21]. So conducting the current study on teachers is significant and results also supports the correlation of teaching and low back pain. Mai et.al., done a systematic review on prevalence of low back pain and its associated factors, the prevalence of low back pain in specific group of population like teaching is examined and the fact that their professional activities are such that which may be a causative factor for inducing low back pain [22]. Our study also held on teachers and came up with the conclusion that there is a high occurrence rate of low back pain among teaching faculty of universities. A study done by Anuar et.al., on secondary school teachers and concluded that ergonomics and occupational activities are linked with prevalence of low back pain [23]. Where as in our study there was also association of teaching and prevalence of low back pain.

## CONCLUSIONS

There is a significant prevalence of low back pain in teachers of universities in Lahore. The intensity of pain varied from mild to severe and most of the teachers experienced mild low back pain.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Relationship of Body Mass Index (BMI) with the Incidence of Inguinal Hernia

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## ARTICLE INFO

## Key Words:

Incidence, Body Mass Index, Inguinal Hernia

## How to Cite:

Hussain, Z. ., Ali Lashari, A. ., uddin, S., Ali Bijarani, F. ., Hussain Memon, A. ., & Chandio, S. . (2022). Relationship of Body Mass Index (BMI) with the Incidence of Inguinal Hernia: Relationship of Body Mass Index (BMI) with the Incidence of Inguinal Hernia. Pakistan Journal of Health Sciences, 3(06). <https://doi.org/10.54393/pjhs.v3i06.368>

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Received Date: 14th November, 2022

Acceptance Date: 26th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

The inguinal wall hernia is the communal hernia of the abdominal wall. It is a communal disorder that affects both males and females from the past long duration. **Objective:** To assess the incidence of unilateral or bilateral inguinal hernia with low body mass index (BMI) and normal BMI subjects. **Methods:** This study was performed in the Surgical unit 1 of Khairpur Medical College and civil Hospital Khairpur Mirs for one-year duration from July 2021 to June 2022. Using an appropriate non-probability sampling technique, this cross-sectional study was held at the surgical unit-1 of Khairpur Medical College and civil Hospital Khairpur Mirs. A total of 90 patients, 80 men and 10 women, were selected for the study. Inclusion criteria were defined as patients over 35 years of age with clinical signs such as reducible swelling in the groin area and clinical signs such as overweight and weight lifting. **Results:** A total of 90 individuals were identified as having an inguinal hernia; their mean age was  $26.18 \pm 18.20$  years old, and they have  $62.78 \pm 4.75$  inches height.  $65.85 \pm 5.19$  was the patients mean weight and  $22.35 \pm 3.26 \text{ kg/m}^2$  was the mean BMI. BMI was low in 18(20%) cases and normal in 72(80%). **Conclusion:** According to our analysis, a significant number of inguinal hernias on either the right or left side had normal BMIs.

## INTRODUCTION

The most frequent hernia of the abdominal wall is the inguinal wall hernia. Approximately, 50% of patients with an inguinal hernia are not aware of their pre-existing problem [1, 2]. The repair of inguinal hernia is the utmost commonly accomplished surgical operations globally [3, 4]. 4% of cases beyond the age of 45 and 1.7% of cases across all age groups typically involve abdominal wall hernias. Inguinal hernias accounts for 78% of reported abdominal hernias, with 4% lifetime risk for women and 28% for males. Inguinal hernia (IH) was a highly widespread condition [5]. Although the precise prevalence of IH is unknown, about 800,000 Americans are diagnosed with it annually, and it is thought that 1 in 2 men will require treatment for an inguinal hernia

throughout their lifetimes [6, 7]. Inguinal hernia is thought to be more likely as a result of abdominal pressure, family history, and tissue disease [8]. Another prevalent factor for elevated abdominal pressure is being overweight. Obesity prevents inguinal hernia, despite what might appear reasonable [9, 10]. Obesity is now recognized as a risk factor for inguinal hernia recurrence, however the genesis of an inguinal hernia and its association to body weight are still up for debate [11]. During hernia repair by laparoscopy, the surgeon creates three-minute incisions in the abdominal wall and then abdomen was inflated with non-toxic gas [12]. The laparoscope is directed through the incisions by the surgeon. Body mass index (BMI) and Using

inguinal hernia risk associations are still debatable. The study's objective was to evaluate the prevalence of inguinal hernias (IG) across a range of BMI categories.

## METHODS

An appropriate non-probability sampling technique, this cross-sectional study was held at the Surgical unit-1 of Khairpur Medical College and Civil Hospital Khairpur Mirs for one-year duration from July 2021 to June 2022. For this study, ethical approval was attained from the Ethical Committee. Informed consent was obtained from patients and their guardians. 90 total patients, 80 men and 10 women, were selected for the study. The following sample formula was used for calculating the adequate sample size in prevalence study;  $n = (z)^2 p(1-p)/d^2$  where  $n$  is the sample size,  $z$  is the statistic corresponding to level of confidence [4]. BMI was calculated using metric or imperial (US) units: Metric units: weight (kilograms) divided by height squared (meters)  $BMI = Kg/m^2$ . Inclusion criteria; patients over 35 years of age with clinical signs such as reducible swelling in the groin area and clinical signs such as overweight and weight lifting. Exclusion criteria; patients less than 20 years of age with groin pain without swelling were omitted from this analysis. Subjects with  $BMI > 30 Kg/m^2$  were not included. The height, age, BMI and weight were recorded in all patients. Less than  $18.5 Kg/m^2$  of BMI was considered low, while  $18.5-24.9 Kg/m^2$  was taken as normal. The percentages and frequencies were determined as qualitative data using the SPSS 20.0 for analysis of the data, while standard deviation and mean were presented as quantitative data.

## RESULTS

A total of 90 individuals were identified as having an inguinal hernia; their mean age was  $26.18 \pm 18.20$  years old, and they have  $62.78 \pm 4.75$  inches height.  $65.85 \pm 5.19$  was the patients mean weight and  $22.35 \pm 3.26 kg/m^2$  was the mean BMI. There are 10 (11.1%) women and 80 (88.9%) men. 14 (15.6%) people had bilateral inguinal hernias, 38 (42.2%) had right sided inguinal hernias, and 38 (42.2%) had left sided inguinal hernias. This analysis revealed that individuals with a normal BMI had higher risk of inguinal hernia than patients with low BMI (Table 1).

Characteristics	No. (Percentage)
Males	80 (88.9%)
Females	10 (11.1%)
Mean age in years	$26.18 \pm 18.20$ years
Mean weight in Kg	$65.85 \pm 5.19$
Mean BMI	$22.35 \pm 3.26$
Mean height in inches	$62.78 \pm 4.75$
Right sided Inguinal Hernia	38 (42.2%)
Left sided Inguinal Hernia	38 (42.2%)
Bilateral Inguinal hernia	14 (15.6%)

**Table 1:** The patient's demographic features

BMI was low in 18 (20%) cases and normal in 72 (80%) (Table 2).

BMI	No. (Percentage)
Normal	72 (80%)
Low	18 (20%)

**Table 2:** Patient's BMI

Males were 36 (94.7%) in left inguinal hernias (LIH) group, 35 (92.1%) in the right inguinal hernias (RIH) group, and 10 (71.4%) in the bilateral inguinal hernia (BIH) group. However, it was observed that no bilateral inguinal hernia (BIH) was noted in females. There were 3 women (7.9%) in the right inguinal hernia (RIH) group and 2 women (5.3%) in the left inguinal hernia (LIH) group. Table 3 shows BMI was normal in 90 (90%) of the patients with bilateral inguinal hernia group (BIH), 30 (78.9%) of the patients with right inguinal hernia and 28 (73.7%) of the subjects with left inguinal hernia (LIH). BMI was found in low 8 (21.1%) and 10 (26.3%) of the patients with right inguinal hernias (RIH) and left inguinal hernias (LIH), respectively but one subject with bilateral inguinal hernias (BIH).

		Right inguinal hernia	Left inguinal hernia	Bilateral Inguinal hernia	P-value
Gender	Males	35 (92.1%)	36 (94.7%)	10 (71.4%)	0.590
	Females	3 (7.9%)	2 (5.3%)	0	
BMI	Normal	30 (78.9%)	28 (73.7%)	9 (90%)	0.116
	Low	8 (21.1%)	10 (26.3%)	1 (10%)	

**Table 3:** The incidence of hernia with relation to gender and BMI

## DISCUSSION

It is believed that obesity causes inguinal hernias to occur more frequently by increasing intra-abdominal pressure [11, 12]. On the other side, the majority of research indicate that being overweight or obese person's decreases the inguinal hernia incidence [13]. According to Melwani et al., analysis; a one unit rise in BMI (increase 3 kg to 4 kg) reduces the likelihood of having an inguinal hernia by 4% in males aged 47 to 55 [14]. Obese subjects have a 43% lower risk of having an inguinal hernia than people of normal weight. Obesity is regarded as a protective factor for inguinal hernia in adult women as well [15]. Our study is comparable with the previous study. The most extensively used indicator for obesity is BMI. A BMI of  $18.5 kg/m^2$  or less is regarded as underweight; the normal range is seen as  $18.5$  to  $24.99 kg/m^2$ ; while a BMI of  $30 kg/m^2$  or higher is regarded as obese [16]. Numerous researches have demonstrated how BMI affects the frequency of inguinal hernias. Patients with normal BMI had a probability of developing a unilateral or bilateral inguinal hernia but our study only looked at people with normal and low BMI. Our study's findings are in line with those of Sangwan et al., who estimated that inguinal hernia incidence in Pakistan was 76.35% [17, 18]. 34 (41.5%) people had bilateral inguinal hernias, 34 (41.5%) had right sided inguinal hernias, and 14

(17.1%) had left sided inguinal hernias. BMI was low in 18 (17.1%) cases and normal in 72 (82.9%). Risk factors include gender, age, coughing, recurrent pregnancies, constipation, prior operations, weight lifting, obesity, genetic susceptibility, and smoking can cause a hernia to occur [19, 20]. Males were 36 (93.2%) in left inguinal hernias (LIH) group, 35 (93.2%) in the right inguinal hernias (RIH) group, and 10 (71.4%) in the bilateral inguinal hernia (BIH) group. However, it was observed that no bilateral inguinal hernia (BIH) was noted in females. There were 3 women (7.9%) in the right inguinal hernia (RIH) group and 2 women (5.3%) in the left inguinal hernia (LIH) group. Similar findings were made by Albukairi et al., who observed that unilateral hernia was more common than bilateral hernia [21]. He noticed that 18 patients were found to have bilateral hernias. Balram discovered that 63.1% of inguinal hernias occurred on the right side. Similar findings have been reported in other research, however in our investigation, patients with normal BMI were more probable to develop a unilateral right inguinal hernia than a unilateral or bilateral left hernia. According to certain studies, the right testicle's delayed descent may be caused by the right sided inguinal hernia [22]. According to Dietz et al., and Gaebler et al., 15% of women and 85% of males have hernias [23, 24]. Additionally, this study found that men were more probable to have hernias than women, though this change was not significant statistically.

## CONCLUSIONS

According to our analysis, a significant number of inguinal hernias on either the right or left side had normal BMIs. Compared to those with a low BMI, individuals with a normal BMI also experience bilateral inguinal hernia. Bilateral hernias occurs less frequently than unilateral ones. According to studies, men are more likely to experience the unilateral inguinal hernias than women who have high incidence of bilateral hernias.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Prevalence of Spontaneous Bacterial Peritonitis in Patients with Liver Cirrhosis with Ascites

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## ARTICLE INFO

## Key Words:

Child Turcotte Pugh, cirrhosis, Spontaneous bacterial peritonitis

## How to Cite:

 Adil Choudary, M. ., Saeed, N.- us- sehar ., Javed, S., Nabeel shafqat, M. ., Mumtaz, S. ., & Farooq, H. . (2022). To Assess Prevalence of Spontaneous Bacterial Peritonitis in Liver Cirrhosis with Ascites: Prevalence of Spontaneous Bacterial Peritonitis in Liver Cirrhosis with Ascites. *Pakistan Journal of Health Sciences*, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.361>

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Received Date: 16th November, 2022

Acceptance Date: 27th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

Bacterial infections are considered a significant challenge in patients with cirrhosis. They account for 25%–46% of hospitalizations in patients with cirrhosis due to significant decompensation processes and are associated with substantial morbidity and mortality.

**Objective:** To determine the prevalence of SBP in patients with liver cirrhosis and ascites.

**Methods:** According to the inclusion criteria, 199 patients with cirrhosis and ascites were included in the study, regardless of the cause of cirrhosis (alcohol, HCV, HBV, autoimmune, cryptogenic, etc.). SBP frequency in cirrhotic with ascites was documented using a proforma. All data was entered into a proforma template. All patients were treated with respect to evaluate the prevalence of SBP in cirrhosis with ascites patients. The study was conducted at the Department of Medicine at Gujranwala Medical College-District Headquarters Hospital in Gujranwala. Total duration of study was six months. **Results:** In terms of patient age distribution, 49 patients (24.6%) were between the ages of 30 and 45, 150 patients (75.4%) were between the ages of 46 and 60. The cohort's patients had an average age of 51.21± 6.61. 42.7% of the population (n = 85) was female, while 57.3% (n = 114) was male. SBP frequency was 32.2% in cirrhosis with ascites individuals. **Conclusions:** We concluded that 32.2% of participants with cirrhosis with ascites also had SBP. The mortality rate in these patients will be decreased by early diagnosis and treatment. Any patient with cirrhosis and ascites should have SBP ruled out.

## INTRODUCTION

Around 80% of cases of ascites are caused by cirrhosis, which accounts for majority of the condition worldwide. The most of the remaining cases are brought on by cancer, heart failure, tuberculosis, pancreatitis, or other uncommon diseases [1]. The serum-ascites albumin gradient (SAAG) can be used to determine the source of ascites when it is not immediately apparent. Calculation can be helpful because it has an accuracy of about 97% in identifying portal hypertension as the cause of ascites formation when SAAG  $\geq$  1.1 g/dl. One of the initial signs of decompensation of cirrhosis and portal hypertension is ascites [2]. All patients with newly developed moderate to

large ascites and those brought to the hospital due to any suspicion of cirrhosis should undergo a diagnostic paracentesis [3]. The total protein and albumin gradients, culture, and automated neutrophil count number must be continuously evaluated [4]. In cirrhotic patients with ascites, spontaneous bacterial peritonitis (SBP) is a serious bacterial infection that necessitates prompt diagnosis and treatment. By definition, SBP is a previously sterile ascitic fluid infection that lacks a clear intra-abdominal source of infection [5]. The organisms that are cause of infection are often ones that are present in the different parts of gastrointestinal tract. The bedside

collection of at least 10 ml of ascitic fluid into blood culture bottles is necessary for ascitic fluid sampling, in order to maximize its sensitivity. Although ascitic fluid culture positivity is not always necessary to diagnose spontaneous bacterial peritonitis (SBP), culture is necessary to guide antibiotic treatment. SBP is diagnosed using accepted criteria: In the absence of an intra-abdominal source of contamination, a WBC count > 500 cells/ $\mu$ l or an absolute neutrophil count > 250 cells/ $\mu$ l as determined by microscopy in ascitic fluid or computerized counter [6]. Uncertainties exist regarding the pathogenesis of spontaneous bacterial peritonitis (SBP). A major contributing factor to the development of SBP is thought to be the translocation of microbes and endotoxins, from gastrointestinal tract vegetation to peritoneal fluid, which is made easier by cirrhotic patients' weakened defenses [7]. Cirrhotic patients have lower levels of complement cascade proteins, and their neutrophils' phagocytic capabilities are impaired. Ascitic fluid infection can also be caused by bacteremia from the respiratory tract or urine [8]. It's important to keep in mind; too, that 10–32% of people with outdoor SBP may also be asymptomatic. All cirrhotic patients with ascites are liable to SBP, and SBP may occur in about 10% to 25% of those patients [9, 10]. About 50% episodes of SBP exist at the time of hospital admission, whilst the rest develop during hospitalization. For the primary episode of SBP in-clinic mortality rates are 10–50% and depend on various elements [11]. The 1-year mortality after recuperation from 1st attack of SBP has been reported to be 60 to 70%. The prevalence of SBP was found to be 24% in a research carried out on cirrhotic patients in Punjab, India. Patients who have been diagnosed with SBP should start receiving antibiotics immediately (cefotaxime, a third generation cephalosporin) [12]. It is not advisable to use aminoglycoside antibiotics (which are likely nephrotoxic) as an empirical treatment [6]. The purpose of this study was to determine the prevalence of SBP in patients with cirrhosis and ascites and to compare the findings to other studies.

## METHODS

According to the inclusion criteria, 199 patients with cirrhosis and ascites were included in the study, regardless of the cause of the cirrhosis (alcohol, HCV, HBV, autoimmune, cryptogenic, etc.). A thorough history of the current symptoms, prior events, drug use, and personal background was collected. All participating cases provided written consent. Before beginning antibiotic therapy, an ascitic fluid was aspirated from each patient in an aseptic setting. SBP frequency in cirrhotic with ascites was documented using a proforma. All data were entered into

Performa, which had been pre-designed. SPSS 20.0 was used to enter and evaluate the data. Frequency and percentages were used to present all of the qualitative variables. Age and gender-specific data were categorized. The chi-square test was used after stratification. P-value less than 0.05 was considered statistically significant.

## RESULTS

199 patients with cirrhosis and ascites admitted in medical ward were included in this study. The study variables like age, gender and prevalence of SBP were calculated for total cohort. Regarding age distribution of patients, 49 patients (24.6%) were in age group of 30–45 years, and 150 patients (75.4%) were between 46–60 years of age. Mean age of patients was  $51.21 \pm 6.61$ . SBP prevalence in patients admitted in medicine wards of DHQ Teaching Hospital Gujranwala with cirrhosis and ascites of any etiology was 32.2% (Table 1).

SBP	Frequency (Percentage)
No	135 (67.8%)
Yes	64 (32.2%)
Total	199 (100%)

**Table 1:** Prevalence of SBP

Among the age group 30–45 years, there were 15 (7.5%) patients who have of spontaneous bacterial peritonitis (SBP). However, the prevalence of SBP was high in 46–60 years of age with insignificant association ( $p$ -value < 0.05) (Table 2).

Age	SBP		Total	P-value
	No	Yes		
30–45 years	Count% of	34	15	0.789
	Total	17.1%	7.5%	
46–60 years	Count% of	101	49	
	Total	50.8%	24.6%	
Total	Count% of	135	64	
	Total	67.8%	32.2%	

**Table 2:** Stratification for SBP with respect to age using chi-square test

There were 85 females in this study among which 22 (11.1%) have positive SBP. And among 114 males the 42 (21.1%) were positive for SBP. There was insignificant association between SBP and gender. (Table 3)

Gender	SBP		Total	P-value
	No	Yes		
Female	Count% of	63	22	0.102
	Total	31.7%	11.1%	
Male	Count% of	72	42	
	Total	36.2%	21.1%	
Total	Count% of	135	64	
	Total	67.8%	32.2%	

**Table 3:** Stratification for SBP with respect to gender using chi-square test

## DISCUSSION

Around 80% of cases of ascites are caused by cirrhosis, which is the primary cause of ascites worldwide. The other examples include cancer, coronary heart failure, TB, pancreatic problems, or other rarer disorders. When the cause of ascites is unknown, the serum-ascites albumin gradient (SAAG) is helpful because, with an accuracy of roughly 97%, a SAAG  $\geq 1.1$  g/dl shows that ascites is caused by portal hypertension. One of the indications that a patient's liver illness has worsened is ascites [13]. All patients with newly developed moderate to large ascites and those hospitalized to the hospital for any cirrhosis-related problem should undergo a diagnostic paracentesis. It is necessary to continuously evaluate cultures, total protein and albumin gradients, and 3-4 manual or computerized neutrophil counts. In this study, 114 were male and 85 were woman and mean age of cohort patients was  $51.21 \pm 6$ . In this cohort, 157 patients (78 %) have liver disease because of HCV, 23 (11.6 %) have HBV etiology, 11 (55%) have NAFLD, 6 patients have alcoholic liver disorder, 1 have cryptogenic liver disorder. Amarpurkar et al., has found SBP in 21 patients out of 31 patients (67.74 %) of liver cirrhotic with ascites admitted in scientific ward of the Ekiti state college coaching health facility (EKSUTH) Nigeria from August 2009 to July 2010 [14]. SBP in patients admitted in medicine wards of DHQ teaching Hospital Gujranwala with cirrhosis and ascites of either etiology is 32.2 % .As all patients with cirrhosis and ascites are prone to SBP and occurring in about one patient in every three patients [15]. Balan G et al. determined incidence of SBP more common in men (41%) with cirrhosis and ascites admitted in medical institution. SBP diagnosis is based totally on a polymorphonuclear count in ascitic fluid of  $> 250$  cells/mm<sup>3</sup> in the absence of any cause of secondary peritonitis [15]. Ding et al. performed a cross-sectional study on 103 patients with cirrhosis and ascitic and discovered that the prevalence of SBP is 25.24%. This is comparable to 25% prevalence found in most of the studies from the developed world [16]. About 50% SBP episodes are recognized at the time the of health facility admission, while remaining of the cases are developed at some point of hospitalization. For the first episode of SBP in-medical institution mortality ranged from 10-50%, which depends on numerous factors. One-year mortality rate after recovery from 1st SBP attack has been mentioned as 60-70 % [16]. The same effects were also obtained in this present study. Treatment of SBP needs to be right away started on empirical antibiotic regimen (cefotaxime, a third generation cephalosporin). Potentially nephrotoxic antibiotics (i.e., aminoglycosides) should not be used as empirical treatment [17, 18].

## CONCLUSIONS

It is concluded that the prevalence of SBP is 32.2% in patients with cirrhosis with ascites. Early diagnosis and treatment will lessen the mortality rate in these patients. One must rule out SBP in any cirrhotic person with ascites. Any patient with cirrhosis and ascites, who present with symptoms must undergo diagnostic paracentesis before beginning the antibiotic treatment.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Transversus Abdominis Plane Block in Laparoscopic Surgery

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## ARTICLE INFO

**Key Words:**

Periportal local anaesthesia, cholecystectomy and postoperative

**How to Cite:**
 Hassan, N. ., Ahmed , I. ., Murtaza, H. ., Ali Malik, A. ., Muhammad ch, I. ., Shahid, S., & Mahmood, S. .(2022). Transversus Abdominis Plane Block in Laparoscopic Surgery : Transversus Abdominis Plane Block in Laparoscopic Surgery. Pakistan Journal of Health Sciences, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.353>
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Received Date: 12th November, 2022

Acceptance Date: 24th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

Good postoperative pain relief has been observed following various inguinal and abdominal procedures using transversus abdominis plane (TAP) block. **Objective:** To determine the outcome of laparoscopically assisted transverses abdominis plane block in laparoscopic cholecystectomy in comparison to periportal local anaesthesia in terms of mean pain. **Methods:** The study was conducted at the Department of General Surgery, Pakistan Atomic Energy Commission Hospital, Islamabad from January 2020 to June, 2020. In this randomized controlled trial, 92 patients underwent elective laparoscopic cholecystectomy were enrolled. Pain score was calculated by visual analogue score at 24 hours post-operatively. Data were entered in SPSS version 25.0. Comparison of both groups was done for pain score using t-test. Data were stratified. The t-test was performed. **Results:** Total 92 patients underwent elective laparoscopic cholecystectomy were selected for the study. The subjects were divided into two categories such as Group 1 or A (TAP block) and Group 2 or B (Periportal local anaesthesia). In the group A the 34(73.9%) subjects were males while the other 12(26.1%) were females, while in the group B the males were 31(67.4%) and 15(32.6%) were females. Mean VAS was 3.69±1.21 in group-A (TAP block) and 4.26±1.29 in group-B (periportal local anaesthesia) with p-value of 0.033. It is statistically significant. **Conclusion:** The one of the safest and effective modalities that provide postoperative analgesia with essentially decreased/less postoperative pain when compared to periportal local anaesthesia is named as laparoscopic assisted TAP block.

## INTRODUCTION

One of the commonest surgical diseases worldwide (80%) is gallstone disease and gold standard treatment considered for symptomatic cholelithiasis is laparoscopic cholecystectomy [1]. Abdominal pain plays a vital role in recovery after laparoscopic cholecystectomy [2]. Pain after laparoscopic cholecystectomy is usually mild to moderate in intensity. Various methods are used to achieve safe and effective postoperative analgesia, which adds the benefit to early recovery of the patients [3]. During prolong stay in hospital, the patients are more prone to acquire the nosocomial infections. This is the most common adverse events in hospitals [4]. For the optimum control of post-operative pain multidisciplinary efforts have been used like using opioids and non-steroidal anti-inflammatory agents.

Local infiltration at port sites, transverses abdominis plane block and many other modalities are used for postoperative pain [5]. However, timing, method, and the type of agent given plays a vital role in determining its effectiveness [6]. Afferent signals of T12-L2 spinal nerves are blocked following infiltration of local anaesthesia in transversus abdominis plane. The effectiveness of transversus abdominis plane block is between 24-36 hours [7]. The nerves which are blocked by this procedure are the one only supplying the abdominal wall [8]. The transversus abdominis plane block has shown noteworthy lower rest pain score at 8 hours as mean 1.82±0.42 in comparison to periportal local anaesthesia, having mean value of 2.12±0.58 with no additional analgesia given [9]. About the

post-operative pain relief, laparoscopically assisted transverses abdominis plane block has mean  $1.97 \pm 0.75$  in comparison to periportal local anaesthesia with mean of  $2.01 \pm 0.75$  with no additional analgesia given [10]. This study was planned to compare transverses abdominis plane block verses peri-portal local anaesthesia in patient undergoing laparoscopic cholecystectomy to asses which technique provides better post-operative analgesia as no local study is available on this topic. To determine the outcome of laparoscopically assisted transverses abdominis plane block in laparoscopic cholecystectomy in comparison to periportal local anaesthesia in terms of mean pain

## METHODS

The review board and ethical committee of the hospital approved the study. The selected patients were informed about the study objective and they signed the consent willingly. The 92 patients were selected for the randomized trial who were undergoing elective laparoscopic cholecystectomy in the Department of General Surgery, Pakistan Atomic Energy Commission Hospital, Islamabad from 1st January till 30th June 30, 2020. Non-probability consecutive sampling technique was adopted. The sample size was taken by using WHO formula. It was 92 patients calculated (46 patients in both groups). Confidence level was 95% with 80% power of test by taking mean VAS (visual analogue pain score) after laparoscopic cholecystectomy. In first group, infiltration of local anaesthesia in transversus abdominis plane & in second group, infiltration of local anaesthesia at port sites as  $1.82 \pm 0.42$  and  $2.12 \pm 0.58$  respectively. Patients of both gender from 18 to 65 years, ASA I & II undergoing laparoscopic cholecystectomy (LC) were selected. Patient with acute cholecystitis, acute pancreatitis, mucocele, emphysematous gallbladder, empyema gallbladder previous abdominal surgery on history, bleeding disorder in past medical record, allergy to local anaesthesia (Bupivacaine) abdominal wall infection, conversion to open procedure or hepatobiliary malignancy diagnosed on ultrasound. The computerized "random number table" was used for the randomization of patients into a group A, that underwent through laparoscopic-assisted transversus abdominis plane block with 40 ml 0.5% bupivacaine, 20 ml in each subcostal region, while group-B received periportal 40 ml 0.5% bupivacaine, 10 ml in each site. All patients received 1gm Paracetamol 8 hourly and 30 mg ketorolac 12 hourly intravenous post-operatively. Additional analgesia with IV Nalbuphine was administered in all patients with pain visual analogue score more than 4 or above. The primary end point of this study was to evaluate pain scores which will be calculated by visual analogue score at 24 hours post-operatively. Data

were entered in SPSS v25.0. The mean standard deviation was used to present quantitative variables such as pain score and age. The t-test was used for the comparison of the pain score of both groups. To deal with the effective modifiers the stratification of data was completed. The data were analysed carefully, result was presented in the form of tables. The conclusion was made according to the data.

## RESULTS

Total 92 patients underwent elective laparoscopic cholecystectomy were selected for the study. The two groups were created and patients were categorized into both groups. The Group A was labelled as (TAP block). While Group B was labelled as (Periportal local anaesthesia) as shown in table 1. Mean VAS in the group A was  $3.69 \pm 1.21$  in (TAP block) while it was  $4.26 \pm 1.29$  in group B (periportal local anaesthesia) with p-value of 0.033 as shown in the table 3. It is statistically significant value.

Visual Analogue Score (VAS)	Groups	n	Mean $\pm$ SD	P-Value
	TAP block	46	$3.69 \pm 1.21$	0.033
	Periportal local anaesthesia	46	$4.26 \pm 1.29$	

**Table 1:** Comparison of VAS in groups

In group A the 34 subjects were males while other 12 were females. In group B the 31 patients were males while other 15 were females. The age range of the patients were calculated and it was reported to be vary between 18-65 years. The  $44.3 \pm 11.5$  year was the reported mean age of the patients. The  $2.5 \pm 10.5$  years is the reported mean age of the patients in the group A. While the reported mean age of the patients included in the group B was observed to be  $44.6 \pm 12.4$  years as shown in table 2.

Visual Analogue Score (VAS)	Gender	Groups	n	Mean $\pm$ SD	P-Value
	Male	TAP block	34	$3.76 \pm 1.26$	0.084
		Periportal local anaesthesia	31	$4.32 \pm 1.30$	
	Female	TAP block	12	$3.50 \pm 1.08$	
		Periportal local anaesthesia	15	$4.13 \pm 1.30$	

**Table 2:** Stratification of VAS according to gender

In group-A, 23(50.0%) had normal BMI, while 21(45.7%) and 2(4.3%) were overweight and obese respectively. The 21(45.7%) patients in the group B had body mass index in the normal range, while 22(47.8%) and 3(6.5%) were overweight and obese respectively. The data was stratified according to the age and the p-value was calculated. The age groups were created and mean and standard deviation of every group was calculated as shown in the table 3.

	Age	Groups	n	Mean $\pm$ SD	P-Value
Visual Analogue Score (VAS)	18-30 years	TAP block	34	3.76 $\pm$ 1.26	0.084
		Periportal local anaesthesia	31	4.32 $\pm$ 1.30	
	31-45 years	TAP block	12	3.50 $\pm$ 1.08	0.189
		Periportal local anaesthesia	15	4.13 $\pm$ 1.30	
>45 years	TAP block	12	3.50 $\pm$ 1.08	0.189	
	Periportal local anaesthesia	15	4.13 $\pm$ 1.30		

**Table 3:** Stratification of VAS according to age

## DISCUSSION

The one of the main concerns for the patients and surgeon now a days is post-operative analgesia. To achieve this goal the multiple methods such as epidural analgesia, anaesthesia infiltration, and patient-controlled analgesia are in use now a days [11]. It is reported by the previous studies that within the 24 hours the effective postoperative analgesia is provided by TAP. It is effective for the lower abdominal surgical procedures [12]. The one of the most effective means for managing postoperative pain in the lower abdominal surgeries is TAP block. It also decreases requirements of postoperative opioid [13]. One of the main concerns for all the surgeons is pain associated with these surgeries. This pain ultimately leads to the increase in the length of stay of admitted patient in hospital it also leads to increase in the cases of morbidity and mortality. The other complication associated with this pain are the psychological effects and it also add to financial burden of the healthcare system [14]. The different modalities that can manage pain are used excessively to lower the pain score associated with the surgeries these includes epidural analgesia, LAI, TAP block peripheral nerve block and intravenous patient-controlled analgesia. The sophistication is brought in the conventional TAP block by the implication of versatile imaging modalities to manage pain. The lower abdominal surgeries usually used TAP block. For the reduction of postoperative pain, the TAP block is considered as effective technique. The usage of morphine consumption is also reduced by using TAP block in the lower abdominal surgery [15]. The most convenient and widely performed procedure is LAI. It is the most common postoperative analgesic method [16]. Postoperative pain alleviation in terms of mean visual analogue scale (VAS) pain score was observed in our study. It was also observed that there is a significant decrease in mean opioid dose requirements after using TAP block. The significantly decrease in the pain score was noticed after usage of TAP block in first 24 hours postoperatively [17]. The results of our study obtained in context of analgesia performed after the inguinal hernia repair with TAP block are consistent with the results of the other studies. Previous studies have reported that the usage of TAP block leads to reduction in pain score, it is also observed in our study. The direct comparison with local anaesthetic

infiltration, adjunct to local anaesthesia, IIN / IHN block or used with conscious sedation for ambulatory inguinal hernia repair [18]. It is observed that the TAP blocker not only helps to reduce the requirement associated with the postoperative morphine but also reduce the side effects associated with the abdominal surgeries that can lead to detrimental effects on the patient health. When compared to LAI group, the reduction in the vomiting and postoperative nausea was also observed when, may be due to decrease opiates consumption. Similar results are seen in other studies reducing both 24 hours postoperative morphine requirements and PONV [19, 20]. In this study, Mean VAS was 3.69 $\pm$ 1.21 in group-A (TAP block) and 4.26 $\pm$ 1.29 in group-B (periportal local anaesthesia) with p-value of 0.033 which is statistically significant. Few studies have shown to be less effective whereas some have shown to be very beneficial about this technique [21, 22]. The transversus abdominis plane block has shown significant lower rest pain scores at 8 hours as mean 1.82 $\pm$ 0.42 in comparison to local infiltration of anaesthetic agent at port sites having mean value of 2.12 $\pm$ 0.58. No additional analgesia was given [18]. Regarding the post-operative pain score, laparoscopically assisted TAP block has mean pain score of 1.97 $\pm$ 0.75 in comparison to port site infiltration of local anaesthetic agent with mean of 2.01 $\pm$ 0.75. No additional analgesia was given [23, 24].

## CONCLUSION

The one of the safest and effective modalities that provide postoperative analgesia with essentially decreased/ less postoperative pain when compared to periportal local anaesthesia is named as laparoscopic assisted TAP block.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Trends Toward Self-Medication Practices During Covid-19 In Gujranwala District

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## ARTICLE INFO

**Key Words:**

COVID-19, Self-Medication, SARS-Cov-2, OTC Medications, Gujranwala District

**How to Cite:**Raza, S. Q., Waqar, M. ., Ahmad, S. ., Iqbal, H. ., & Saifullah, A. . (2022). Trends Toward Self-Medication Practices During Covid-19 In Gujranwala District: Trends Toward Self-Medication Practices During Covid-19. Pakistan Journal of Health Sciences, 3(06). <https://doi.org/10.54393/pjhs.v3i06.259>**\*Corresponding Author:**Syed Qasim Raza  
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## ABSTRACT

In Gujranwala, self-medication is a prevalent practice since it offers a low-cost alternative for individuals, and it entails the incorrect and irresponsible use of medications to cure self-recognized symptoms. It is also noteworthy that SM has both positive and negative aspects that affect the life of people. **Objectives:** To determine the occurrence, pattern, and sources of self-medication among respondents with all socioeconomic statuses and educational levels. **Methods:** A cross-sectional online survey on 535 residents of the targeted region was undertaken from June to November 2021 in Gujranwala district. We analyze our data by using SPSS and find mean values of our different variables and also find the frequencies and percentages the variables for achievement of our desired results. **Results:** As COVID-19 preventive, 44 (8.7%) respondents self-medicated with penicillin, and only 4 (0.8%) with paracetamol. When COVID-19 symptoms appeared, the pattern shifted, with azithromycin having the highest rate of self-medication of 49 (9.75%) of all drugs. When people were diagnosed with COVID-19, 12.5% used azithromycin, and 10.3% used penicillin. **Conclusions:** This study found a significantly high level of SM among men in Gujranwala district. Analgesics, particularly paracetamol and Ibuprofen, were the most often utilized medications for SM.

## INTRODUCTION

Medications used by the patients for self-assessed disease and symptoms come under the term SM. This also includes the patient's choice of medication for a chronic or repeating condition following a physician's prescription. The administration of medicinal products for family members, especially infants, children or the elderly also comes under the umbrella of SM. In responsible SM, diseases that can be quickly and easily self-diagnosed or that have already been diagnosed by a doctor are treated with non-prescription, safe, conventional pharmaceutical items. According to the WHO, supportive SM must provide information about the way to use medications, withdrawal symptoms, monitor, precautions, period of usage, interactions [1]. Desire for self-care, empathy with family members in illness, lack of health facilities, poverty,

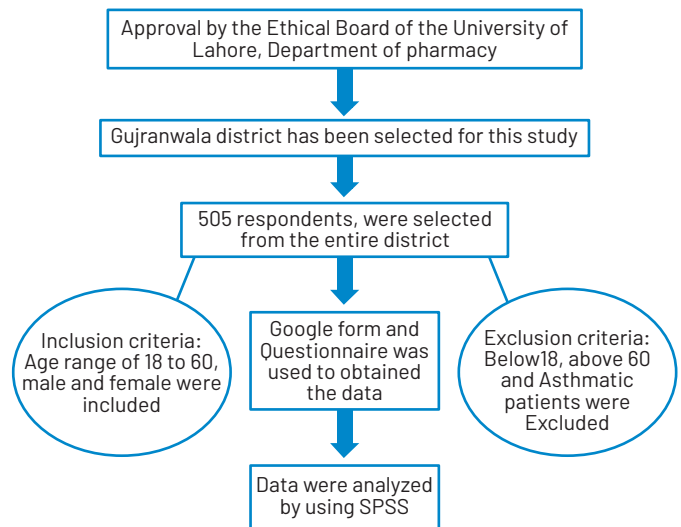
ignorance, mistrust, widespread advertising and availability of medicines in addition to drug stores are responsible for the growing trend towards SM. WHO is promoting the responsible SM practices to reduce the burden on healthcare system, especially in rural areas where most of the time, the lacking of staff has been seen [2]. The SM behavior in teenagers is affected by various factors. Trend towards self-care and overconfidence in drug knowledge often serve as stimuli for SM and drug abuse. Adults not only use older prescriptions, leftover and OTC medicines but also share medicines with friends and relatives. OTC and prescription only drugs can easily be reached without the vital information about the indications and ultimately pushing them towards unnecessary risk. Although adolescents show a sense of responsibility but

the risk of drug abuse and overuse associated with SM is still there. SM has major impact on health system of the entire globe. The prevalence of SM in developing countries is high as compared to developed countries; its rate is 84% in Pakistan, and 78% in Saudi Arabia [3].

## METHODS

The Ethical Board of the Pharmacy Department of the University of Lahore gave its approval to the study. Before collecting data, each respondent gave their verbal consent. The survey's participants were anonymized, given the freedom to respond answer whenever they wanted, while any personal data considered a secret. Every survey respondent understood the goals of the study. The administrative division of Pakistan's Punjab province is titled Gujranwala Division. It is situated in the province's northeast, covers 3,622 km<sup>2</sup>, and has an estimated 5.014 million residents. The current investigation was carried out in several areas and pharmacies. In order to explore the knowledge and use of SM, this cross-sectional online/physical survey used a descriptive non-experimental research methodology. It was done from June to November 2021, at the time of the national lockdown and the increase in the number of positive COVID19 cases. The study lasted for six months (June–November 2021). The totals of 505 participants were randomly selected from various retail pharmacies in different locations. The retail pharmacies were chosen based on patient inflow. The number of respondents was determined using a 95% confidence interval with a 5% margin of error. In this study, People ranging from 18 to 60 years' male or female or any other were included with education level of secondary qualification or above, because most of the patients belonging to this age are easy to find, and usually do not have a severe chronic disease. It is also important to mention here that our population was not only educated people but also uneducated or with very little education. These types of people can also SM by directly telling the disease to a seller at community pharmacy or by the suggestion of their peers. Below 18 and above 60 years of age, asthmatics, and patients with severe chronic diseases were excluded from this study. People below the age of 18 are usually immature and don't answer properly to a questionnaire (due to poor power of understanding) and above 60 years of age had mostly different comorbidities. Keeping in view all these parameters, the age groups of the population were excluded from the study. A self-made questionnaire made in Google survey form was used to collect the data. It provides a fast way to create an online survey and enable us to spread it easily through different social media platforms throughout the Gujranwala district. Responses were

collected on spreadsheet and simple descriptive statistics were applied to analyze the data and anticipate our results. By using IBM SPSS version 20 for Windows, all data were examined. Descriptive statistical analysis, like percentages, frequencies, standard deviation, and means were used to present the descriptive result. While categorical variables were indicated as frequency with percentages, continuous variables were indicated as mean  $\pm$  SD.



**Figure 1:** Flow chart of Methodology

## RESULTS

The survey's physical and online forms were filled out by 535 people in total. Following the exclusion of 30 respondents who did not meet the study's inclusion criteria, the remaining total number of respondents was 505. Among the total participants 302 (59.8%) were male with the mean age of  $30.18 \pm 9.7$  years. The majority of participants were single 276 (54.7%), educated 487 (96.4%), employed (263 (52.1%)), and all 505 (100%) were the resident of the urban area according to Table 1.

Sr. No	Characteristics	n (%)
1	<b>Gender</b>	
	Male	302 (59.8)
	Female	203 (40.2)
2	Age*	30.18 $\pm$ 9.7
3	<b>Marital Status:</b>	
	Married	276 (54.7)
	Unmarried	229 (45.3)
4	<b>Marital Status:</b>	
	Educated	487 (96.4)
	Uneducated	18 (3.6)
5	<b>Employment Status:</b>	
	Employed	263 (52.1)
	Unemployed	242 (47.9)
6	<b>Residential Area:</b>	
	Urban	505 (100)

**Table 1:** The respondents' frequency distribution according to

their socio-demographic features

The categorical variables are expressed as frequency and percentages

(\*)Indicates the mean values of continuous variable

Except for paracetamol, the majority of respondents did not self-medicate with other listed drugs in a very subtle way, as shown in Table 2. According to the findings, the majority of respondents (93.5%) used paracetamol and (35%) antihistamines, while nearly the same number consumed (34%) dextromethorphan, Azithromycin was consumed (47.9%), Antivirals were used nearly (14%) and the least amount was used (4.6%) calcium. Indicate whether you used any of these medications while COVID-19 was under lockdown.

Sr. No	Drugs	n (%)
1	Paracetamol	472 (93.5)
2	Ibuprofen	208 (41.2)
3	Azithromycin	242 (47.9)
4	Hydroxychloroquine	112 (22.2)
5	Penicillin	212 (42)
6	Antiviral	74 (14.7)
7	Antihistamine	177 (35)
8	Dextromethorphan	174 (34.5)
9	Calcium	23 (4.6)

**Table 2:** Self-Medication with various drugs during the COVID-19  
The categorical variables are expressed as frequency and percentages.

The primary causes for drug intake for all medications were cold or flu except antiviral and hydroxychloroquine. For purposes other than pain relief (4.0%) of respondents used ibuprofen. To a lesser extent, antivirals were utilized by (1%) of participants, While (1.6%) took this anti-malarial medication HCQ for different causes. The fact that people in the Gujranwala district used these medications while having no symptoms was even more alarming. As an instance, (12.7%) Antihistamine, (2.4%) Paracetamol and other drugs utilized almost the same. It must be noted that the same responder may have consumed many drugs simultaneously. Three causes for drug usage in related to COVID-19 were listed on our survey: prevention, the existence of symptoms, and verified cases. As COVID-19 preventive, 44 (8.7%) respondents self-medicated with penicillin, only 4 (0.8%) with paracetamol, and approximately the same amount of ibuprofen 25 (5%), and 27 (5.3%) azithromycin. When COVID-19 symptoms appeared, the pattern shifted, with azithromycin being the drug with the highest SM 49 (9.75%), followed by the lowest SM of paracetamol 8 (1.6%). When people were diagnosed with COVID-19, 12.5% used azithromycin, and 10.3% used penicillin. Dextromethorphan (6.5%) and antihistamine (6.7%) were both used by nearly the same proportion of people.

## DISCUSSION

It is also significant to mention here that in Hyderabad-Karachi a study similar to ours was conducted by Arian et al., elaborating SM practices among medical students of prestigious institutes [4]. The availability of all types of medicines OTC, prescription-only, and even schedule X substances without a prescription is the most major element for the rise in SM. A cross sectional study similar in many ways to our study was also conducted in Peru and Dhaka city of Bangladesh, showing the trend of population towards SM during the pandemic. The outcomes of both studies were resembling to our study with very much similar result except the population ethnicity and targeted territory from where population participated in the study [5, 6]. Nagarajiah et al., did a study based on our research on the prevalence and pattern of SM behaviors. But the study was conducted in only a single district (Gujranwala) during the COVID-19, while the performed research three districts of south Karnataka before the COVID-19 pandemic [7]. Quispe-Cañari et al., found that Ibuprofen, another analgesic marked as the mostly used drug during covid-19 among the population of Gujranwala district (41%) after paracetamol [5]. The SM has negative and positive effect on health care system and general population [8]. Sadio et al., found that prevalence of SM during COVID-19 and its associated factor that high risk to resistances the antibiotic in lome [9]. The high fatality rate and socio-economic collapse affected the health of uninfected people because they skipped the healthcare measures, visiting clinical and hospital appointments to limit their exposure to the virus same as in over study [10]. The Spanish healthcare system, including community pharmacies, has failed to enhance the rational use of medicines as same condition in Gujranwala district [11]. The SM practices source is various community pharmacies, and recommendation from friends or previous experience [12]. SM among prospective healthcare professionals poses a severe danger to medical professionals and has the potential to publics [13]. Mudenda et al., studied the poor healthcare seeking behavior, most individual's SM using drugs that are known to be effective against malaria, the common cold, and COVID-19. Antibacterial, antimalarial, and antivirals are some of the most widely utilized drugs [14]. The study in Islamabad and Ethiopia as same result most commonly used pharmaceuticals were paracetamol and NSAIDs, with drug retail shops being the most common source of drugs for SM [15, 16]. SM was not related to socioeconomic position, ethnicity, or age but it was associated with a person's educational level and antibiotic knowledge [17]. Nunes et al., found variety of medical disorders in which SM with NSAIDs was popular. Therefore the necessity for more

sensible use of NSAIDs the continued Pharmacovigilance was backed up by reported side effects (both common and rare) [18]. Higher values of a composite ("lockdown") index of SM related behaviors occurring during lockdown were predicted by higher religiosity and the presence of children in a household, according to linear regression [19]. High risk of SM and prefer drug therapy recommendations from TV, social media, and influencers [20]. All prior studies, according to our approach employed throughout this study effort, characterize SM during COVID-19 as a confounder that increases problems. To our knowledge, no research has been done in the Gujranwala district to evaluate the pattern of SM for respiratory symptoms during the COVID-19 outbreak. Except for this study, no other study has ever used both types of survey forms (E-forms and physical questionnaires) as shown above the boundaries.

## CONCLUSIONS

This study found a significantly high level of SM among men in Gujranwala district. This was due to their extensive experience and education, as well as their in-depth knowledge and comprehension of illness processes and management. This enabled them to make educated about which medications to utilize for particular conditions. Analgesics, particularly paracetamol and Ibuprofen, were the most often utilized medications for SM.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The authors received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Assessment of Levels of CRP As A Measure of Stress Response After Open and Laparoscopic Cholecystectomy

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## ARTICLE INFO

## Key Words:

Open Cholecystectomy, C-Reactive Protein, Stress Response, Laparoscopic Cholecystectomy.

## How to Cite:

Ahmed Khattak, I. ., Iqbal, J. ., Younis, S. ., Aamer Hussain, S., Rashid, Z., & Shoaib Khan, M. . (2022). Assessment of Levels of CRP As A Measure of Stress Response After Open and Laparoscopic Cholecystectomy: Stress Response after Open and Laparoscopic Cholecystectomy. *Pakistan Journal of Health Sciences*, 3(06).

<https://doi.org/10.54393/pjhs.v3i06.307>

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Received Date: 2<sup>nd</sup> November, 2022

Acceptance Date: 18<sup>th</sup> November, 2022

Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

Laparoscopic cholecystectomy (LC) is supposed to be a first line treatment for complicated bile stones and is regarded as the minimally invasive surgery. **Objectives:** To determine the levels of CRP as a measure of stress response after open and Laparoscopic cholecystectomy. **Methods:** A total of 120 patients of both genders aged 20 years or above with fever, abdominal pain, vomiting, nausea and anorexia with symptomatic gall stone were chosen. Laboratory tests, ultrasound and chest radiography were carried out to verify the diagnosis of cholecystectomy and prevent a negative abdomen exploration. The comparison of CRP levels between the two groups was done at 4, 8 and 24 hours. The values of CRP in both procedures were compared with the t-test with P-0.000 taken as significant. **Results:** The patients mean age was 36.09 ± 8.10 years. There were 50 men and 70 women. Mean CRP was 7.20 ± 2.10 after 4 hours of laparoscopic cholecystectomy; however, after open cholecystectomy, it was 11.30 ± 1.80, CRP after 8 hours in LC was 13.50 ± 7.01 and 21.04 ± 2.14 after open cholecystectomy. The mean CRP levels in laparoscopic cholecystectomy after 24-hrs were 23.40 ± 7.92 and 34.81 ± 7.04 after open cholecystectomy. The most affected age group was 20-35 years in 39(32.5%) patients, 31-50 in 47(39.2%) and 51-65 in 34(28.3%) patients. This study did not find postoperative complications or mortality. **Conclusions:** CRP is a valuable marker in determining the response to stress in subjects with laparoscopic and open cholecystectomy.

## INTRODUCTION

All over the world, laparoscopic cholecystectomy (LC) is supposed to be a first line treatment for complicated bile stones and is regarded as the minimally invasive surgery with short hospital stay, minimal scar, reduced postoperative pain, lower costs, early return to normal routine works in comparison to open cholecystectomy [1, 2]. The stress response in various surgical procedures causes the release of stress hormones as a normal physiological stimulus, regulation of metabolic and fluid

balance, negative nitrogen balance and augmented release of acute phase reagents [3, 4]. After surgical incision; various stimulatory events occur including inflammatory cytokines depending on the size of the injury [5, 6]. The acute phase reactant is CRP which is a sensitive inflammatory marker and plays a very important role in inflammation [7]. Various researches have shown that in open cholecystectomy there is a stronger stress response than laparoscopic cholecystectomy [8]. Shukla and his



friends found a significant increase in CRP levels in the postoperative period with a statistically significant value in LC in comparison to open cholecystectomy [9]. Cochrane's study conducted by Matovic and his friend showed a reduction in incidence of morbidity and stress response post-operatively in LC patients compared to open cholecystectomy [10]. Zhang et al., found in his system review that the levels of CRP release depend on the surgical injury extent and the degree of invasiveness of the procedure [11]. Krog and his friends also found a lower level of metabolic and stress response in LC patients in comparison to open cholecystectomy [12]. The purpose of this analysis was to determine the levels of CRP as a measure of stress response after open and Laparoscopic cholecystectomy.

## METHODS

This cross-sectional observation study was held in the surgical department of KMU IMS Kohat and THQ hospital, Kakki Bannu during the period from November 2021 to April 2022. A total of 120 patients of both genders aged 20 years or above with fever, abdominal pain, vomiting, nausea and anorexia with symptomatic gall stone were chosen. From this study, patients with jaundice, serious infections or metabolic disorders, neurological or psychiatric diseases, coagulation disorders and patients who did not agree were excluded. The patient or his guardian have given informed consent to participate in this study. The patient's age, name, admission number, gender and surgery date were documented. The operation was performed by an experienced surgeon with over five years of experience. Two groups were formed with lottery method; Laparoscopic cholecystectomy was done in group 1 and open cholecystectomy in group 2. The lottery method was used to divide patients into groups. The comparison of CRP levels between the two groups was done at 4 hours, 8 hours and 24 hours. The upper reference limit for CRP was 3 mg/dl measured by the ELISA test. The data was analyzed with SPSS software version 20.0. The age of the patient is taken as continuous variable and duration of symptoms and CRP were expressed as the mean  $\pm$  SD. Qualitative variables were expressed as frequency and percentage. The values of CRP in both procedures were compared with the T test with P=0.000 taken as significant.

## RESULTS

120 patients selected for laparoscopic and open cholecystectomy were included. The patients mean age was  $36.09 \pm 8.10$  years shown in table 1. There were 50 men and 70 women.

Features	N(%)
<b>Gender</b>	
Males	50(41.7%)
Females	70(58.3%)
Mean Age	$36.09 \pm 8.10$ years

Age-Range in years	
20-35	39(32.5%)
31-50	47(39.2%)
51-65	34(28.3%)

**Table 1:** Shows the demographic features of the patients

Mean CRP was  $7.20 \pm 2.10$  after 4 hours of laparoscopic cholecystectomy; however, after open cholecystectomy, it was  $11.30 \pm 1.80$ , CRP after 8 hours in LC was  $13.50 \pm 7.01$  and  $21.04 \pm 2.14$  after open cholecystectomy. The mean CRP levels in laparoscopic cholecystectomy after 24-hrs were  $23.40 \pm 7.92$  and  $34.81 \pm 7.04$  after open cholecystectomy. The most affected age group was 20-35 years in 39(32.5%) patients, 31-50 in 47(39.2%) and 51-65 in 34(28.3%) patients shown in table 2. This study did not find postoperative complications or mortality.

CRP Levels	Laparoscopic Cholecystectomy	Open Cholecystectomy
At 4hrs	$7.20 \pm 2.10$	$11.30 \pm 1.80$
At 8hrs	$13.50 \pm 7.01$	$21.04 \pm 2.14$
At 24hrs	$23.40 \pm 7.92$	$34.81 \pm 7.04$

**Table 2:** Shows the mean CRP values at various time intervals

## DISCUSSION

Every year, laparoscopic cholecystectomy is the most commonly used procedures from over 500,000 operations with <1.5% complication rate and a mortality below 0.1% [11, 12]. In comparison with open cholecystectomy, laparoscopic cholecystectomy has been a surgery since 1991 due to less morbidity, mortality and earlier return to work [13,14]. CRP is a strong inflammatory marker and is called the acute phase reactant. Various analysis has exhibited that CRP often increases in patients after laparoscopic cholecystectomy due to pneumoperitoneum and abdominal lift as well as in open cholecystectomy postoperatively [15, 16]. Helander et al., found that surgical procedure or intervention is considered a form of trauma in itself, followed by an inflammatory, hormonal and immune response [17]. It is known, however, that laparoscopic cholecystectomy is associated with smaller complications and stress for the patient and minimally invasive surgery [18]. In our study, most patients belonged to age groups from 21 to 35 and 35 to 50 years old, and the frequency of gall stones in women was higher than in men. This discovery is similar to the results of gallstones in previous studies [19, 20]. Our study also showed similar results of a reduced response to stress in patients with LC in comparison to open cholecystectomy. In our study, both groups were compared with the average CRP value with a statistically significant correlation P-value of 0.000. Open cholecystectomy is an acceptable alternative to patients from the high-risk group or patients with complicated cholecystitis. Various analysis have revealed that the high preoperative CRP, the high number of TLC and the increased gallbladder thickness are related with a higher

percentage of problems and a higher conversion rate of open cholecystectomy [21]. In patients with high CRP before surgery, Kingo et al., found that the frequency of transition to open cholecystectomy was higher [22]. Beliaev et al., also found that high CRP in serum significantly increased the OC in comparison to patients with LC ( $8.88 \pm 1.96\%$  compared to  $10.52 \pm 1.96\%$ ) and came to the conclusion that LC was less traumatic [23]. Incision of the skin causes maximum tissue injury and is therefore responsible for the severity of the acute phase responses in OC. Therefore, LC prevents reduction of injury, reducing blood counts, length of stay in the hospital, and thus reducing the incidence, and thus lowering the CRP level [24].

## CONCLUSIONS

CRP is a valuable marker in determining the response to stress in subjects with laparoscopic and open cholecystectomy.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Prediction of Left Ventricle Function from Pre-Operative Left Ventricle End-Systolic Dimension in Mitral Valve Replacement

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## ARTICLE INFO

**Key Words:**

Left Ventricle End-Systolic Dimension (LVESD), Left Ventricle Ejection Fraction (LVEF), Mitral Valve Replacement (MVR), Rheumatic Heart Disease, Left Ventricle End-Diastolic Dimension (LVEDD)

**How to Cite:**
 Saleem, W. ., Iqbal, F., & Saleem, F. . (2022). Prediction of Left Ventricle Function from Pre-Operative Left Ventricle End-Systolic Dimension in Mitral Valve Replacement: Prediction of Left Ventricle Function from Pre-Operative Left Ventricle End-Systolic Dimension. *Pakistan Journal of Health Sciences*, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.339>
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 Received Date: 10<sup>th</sup> November, 2022

 Acceptance Date: 21<sup>st</sup> November, 2022

 Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

Rheumatic heart disease is an endemic in developing countries. The most common valve affected is the mitral valve for which mitral valve replacement is done. Left Ventricle Function (LVEF) is used to measure the prognosis of patients after MVR. Patients with a good LVEF perform better with less morbidity and mortality in comparison to patients with low post-operative EF. Therefore, prediction of post-operative EF is mandatory in patient's selection and post-operative management. **Objective:** To determine the effect of pre-operative left ventricular end-systolic dimension in predicting postoperative LV function in mitral valve replacement. **Methods:** A total of 100 patients with mitral valve replacement were selected for the research. The study was conducted at the cardiac surgery department of National Institute of Cardiovascular Diseases, Karachi from April 2022 to October 2022. **Results:** The mean age of patients was  $37 \pm 10$  years, LVESD:  $34.7 \pm 8.4$ mm, LVEDD:  $51.1 \pm 9.1$ mm, PASP:  $44 \pm 11$ mmHg, and EF of  $55 \pm 9\%$ . Patients having Left ventricular end-systolic dimension (LVESD)  $> 38$  mm had a significant post-operative left ventricular dysfunction after mitral valve replacement than patients having a pre-operative LVESD  $< 38$ mm ( $p = 0.003$ ). Moreover, patients having a pre-operative LV dysfunction (EF  $< 55\%$ ) were more prone to post-operative LV dysfunction ( $p = 0.02$ ). However, pre-operative LVESD is a more sensitive predictor of post-operative LV dysfunction than pre-operative LVEF ( $0.003 < 0.02$ ). **Conclusion:** Left Ventricular End-Systolic Dimension (LVESD) is a more sensitive parameter as compared to pre-operative LV ejection fraction (LVEF) in predicting post-operative LV ejection fraction (LVEF) after mitral valve replacement (MVR).

## INTRODUCTION

Rheumatic Heart Disease (RHD) makes up about 20% burden of heart disease in the endemic population. It results from acute rheumatic fever as a result of infection by Group A Streptococci; M-protein cross-reacts with the cardiac myosin which causes T-cell-induced injury of heart valves [1]. Rheumatic fever occurs 2-3 weeks after infection by Group A streptococci and individuals present with rheumatic heart disease in their 20's and 30's [2]. According to an estimation, 50 to 80 million are suffering from Rheumatic heart disease worldwide [3]. The most common heart valve affected by rheumatic heart disease is

the mitral valve followed by the aortic valve. Isolated mitral stenosis occurs in about 40% of patients with RHD and 60% of patients give a history of suffering from rheumatic fever [4, 5]. The common presentation is dyspnea precipitated by exercise, emotional stress, pregnancy, infection, sexual intercourse, and rapid atrial fibrillation. The echocardiographic findings of rheumatic heart disease include anterior leaflet thickening, chordal thickening, chordal fusion restricted leaflet motion, excessive leaflet motion, and leaflet prolapse [6, 7]. Mitral valve replacement is the preferred surgical option in case of RHD due to an

ongoing disease process which can lead to failure of mitral repair [4, 8]. Mitral valve replacement (MVR) can be done through standard sternotomy, lateral thoracotomy (minimally invasive) incisions, or small ports (robotic valve surgery) [9]. The postoperative left ventricular systolic contractile function is a major determinant of the prognosis and recovery of patient after mitral valve replacement [10]. Ejection fraction in post-operative echocardiography can accurately tell the function of heart after mitral valve replacement. We normally use pre-operative ejection fraction as a predictor of post-operative ejection fraction. However, end-systolic dimension is less dependent on left ventricle loading condition than is pre-operative ejection fraction. It is therefore a better measure of postoperative left ventricular systolic function [11].

## METHODS

This is a retrospective study of 100 patients from April 2022 to October 2022. The study was conducted at National Institute of Cardiovascular Diseases, Karachi. It was an observational cross-sectional study. A randomized, non-probability sampling technique was utilized. Inclusion criteria included all ages, either gender, only mitral valve surgeries, and all patients which come under class 1 of American Heart Association guidelines for mitral valve replacement [12]. Exclusion criteria included double valve replacements, concomitant coronary artery bypass surgery, aortic valve replacements, moderate to high risk-surgery on Euro score, redo operations, and all those who refused to participate in the study. All patients with missing pre-operative and post-operative LVESD and Ejection Fraction (EF) were excluded from the sample. All the pre-operative data of patient was taken with a special focus on echocardiography report and echocardiographic images. Pre-operative echocardiography was performed within 3 months of operative and post-operative echocardiography within 1 month after the valve replacement. The per-operative details of patients were noted and then post-operative echocardiographs and early recovery of patient. All post-operative echocardiographs were done by FCPS consultants. All patients having cardiopulmonary bypass times of >150 mins and aortic cross-clamp times > 100 minutes were excluded from the study to avoid the discrepancy in the results due to long cardiopulmonary bypass (CPB) and cross-clamp times. Informed verbal consent from patients was taken from all patients. All the data was taken from cardiac surgery department of NICVD. All the mitral valve surgeries were performed by experienced surgeons having more than 10 years post-fellowship experience in mitral valve replacements. The data was collected and analyzed via SPSS version 23 (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp). Frequency calculated

by standard methods. Mean  $\pm$  standard deviation was obtained for quantitative variables like age (years), LVESD (mm), LVEDD (mm), PASP (mmHg), and EF (%). Frequencies and percentages were calculated for categorical variables like types of mitral valve disease and size of prosthetic mitral valves used for replacement. The non-parametric chi-square test is applied to the data. Statistical significance is kept at  $p < 0.05$ .

## RESULTS

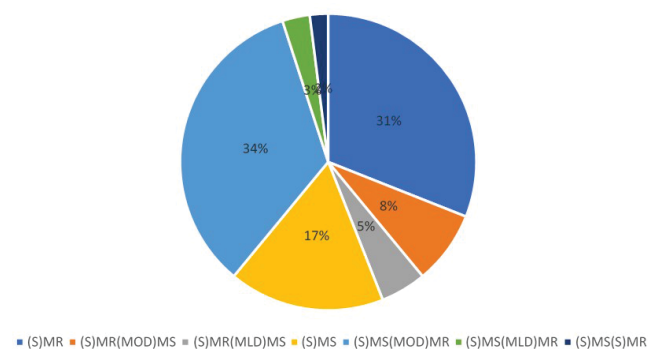
A total of 100 patients were included; 70% of our sample consisted of females and 30% males. The mean age of our patients was  $37 \pm 10$  years (minimum: 17 years and maximum: 68 years), LVESD of  $34.7 \pm 8.4$  mm, LVEDD of  $51.1 \pm 9.1$  mm, PASP of  $44 \pm 11$  mmHg, and pre-operative ejection fraction of  $55 \pm 9$  and  $47 \pm 12$  % (Table 1).

Parameters	Mean $\pm$ SD
Age (years)	$37 \pm 10$
LVESD (mm)	$34.7 \pm 8.4$
LVEDD (mm)	$51.1 \pm 9.1$
PASP (mmHg)	$44 \pm 11$
PRE-OP EF (%)	$55 \pm 9$
POST-OP EF (%)	$47 \pm 12$

**Table 1:** Patients Characteristics

All patients were suffering from Rheumatic heart disease of mitral valve. Other types of degenerative or ischemic mitral valve diseases were excluded from the sample. We divided the sample on basis of valvular pathology: 31% of patients had severe mitral regurgitation, 8% had severe mitral regurgitation and moderate mitral stenosis, 17% had severe mitral stenosis (Wilkin score more than 8, not candidates of PTMC), 31% had severe mitral stenosis and moderate mitral regurgitation, 3% had severe mitral stenosis and mild mitral regurgitation and 2% had severe mitral regurgitation and severe mitral stenosis (Figure 1).

TYPES OF MITRAL VALVE DISEASE

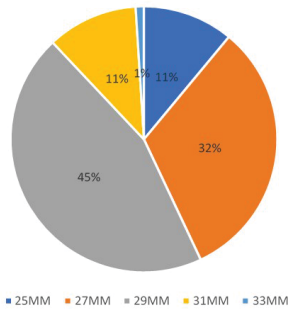


**Figure 1:** Types of Mitral Valve Diseases

A total of 100 patients were included; 70% of our sample consisted of females and 30% males. The mean age of our patients was  $37 \pm 10$  years (minimum: 17 years and maximum: 68 years), LVESD of  $34.7 \pm 8.4$  mm, LVEDD of  $51.1 \pm 9.1$  mm, PASP of  $44 \pm 11$  mmHg, and pre-operative ejection

fraction of  $55 \pm 9$  and  $47 \pm 12$  % (Table 1).

SIZES OF MITRAL VALVE REPLACEMENT



**Figure 2:** Sizes of Mitral Valve Replacement

The data set of patients was divided to check for significance level. The LVESD was broadly divided into  $> 38$  mm and less than 38 mm. It was found that patients whose left ventricular end-systolic dimension was greater than 38 mm had a drop in their post-operative Ejection Fraction after mitral valve replacement ( $p = 0.003$ ) (Table 2).

LVESD	Preserved Post-Op LV Function		p-value
	Yes	No	
< 38 mm	55 (35.38) [10.88]	6 (25.62) [15.03]	0.003
>38mm	3 (22.62) [17.02]	36 (16.38) [23.5]	

**Table 2:** Relationship between LVESD and preserved postoperative LVEF

Ejection fraction of patients was also divided into short sets to increase accuracy level. Patients with a pre-operative Ejection Fraction of less than 55% suffered from post-operative LV dysfunction and patients with a pre-operative ejection fraction of more than 55% suffered less from LV dysfunction after mitral valve replacement ( $p = 0.02$ ) (Table 3). However, if we intend to find a more reliable parameter to predict post-mitral valve replacement, we can deduce that LVESD is a more sensitive parameter as p value of  $0.003 < 0.02$ .

Pre-Op EF	Preserved Post-Op LV Function		p-value
	Yes	No	
<55%	11 (16.25) [1.7]	14 (8.75) [3.15]	0.02
>55%	54 (48.75) [0.57]	21 (26.25) [1.05]	

**Table 3:** Relationship between pre-operative EF and preserved postoperative LVEF

Age of the patient, LVEDD, and PASP played no direct role in determination of post-operative LV function in mitral valve patients (Table 4).

Parameter	Preserved Post-Op LV Function		p-value
	Yes	No	
AGE	36.56	40.55	0.8
LVEDD	47.63	59.72	0.7
PASP	65	29	0.3

**Table 4:** Relationship of age, LVEDD, and PASP with preserved postoperative LVEF

## DISCUSSION

Ejection Fraction post-operatively is a predictor of all-cause mortality [13]. A higher ejection fraction is associated with a better prognosis [14,15]. Our results have shown that LVESD is a definitive parameter to predict post-operative LV function in mitral valve patients. The research also proved the role of pre-operative Ejection fraction in predicting post-operative Ejection Fraction. However, in comparison to pre-operative LVESD, pre-op EF has an inferior predictability value for post-operative LV function after mitral valve replacements. Wang et al., studied the role of pre-operative LVESD and EF in determining postoperative EF in CABG patients. They included a sample of 939 patients. They concluded that smaller LVESD and lower ejection fraction have a greater potential for postoperative improvement in ejection fraction and outcomes [16]. In retrospective research by Tribouilloy et al., studied the additive value of LVESD to EF and collected a sample of 335 patients to predict the association between these pre-operative parameters and postoperative left ventricular dysfunction after mitral valve repair surgery done for severe mitral regurgitation. They concluded that pre-operative EF  $> 64\%$  and LVESD  $< 37$  mm incurred a lower postoperative risk of LV dysfunction [17]. Quintana et al., studied the sample of 1705 patients suffering from severe mitral regurgitation but preserved left ventricular function and discussed that a normal pre-operative EF is a misleading criterion to predict postoperative left ventricular dysfunction and found that it is not uncommon for patients having a preserved pre-operative EF to suffer from LV dysfunction after the surgery [18]. Wu et al., studied the combined association between high inferior vena cava diameter and LVESD in the causation of major adverse cardiovascular events and overall mortality in patients undergoing hemodialysis. They concluded that high LVESD is directly linked to higher all-cause mortality and major adverse cardiovascular adverse events [19]. Starling et al., in their study divided the sample into 3 groups; one with normal contractile function, 2nd with impaired contractile function but preserved ejection fraction, and 3rd with impaired contractile function. The LV function was assessed after the mitral valve surgery and found that left ventricular elastance is a better predictor to determine post-operative LV function than LVEF [20]. These studies add an additive value to our research and testify to the global applicability of our results on patients of rheumatic mitral valve disease undergoing mitral valve replacements.

## CONCLUSIONS

Left ventricular end-systolic dimension (LVESD) is a reliable parameter to predict post-operative left ventricular ejection function. It can be regarded as a more

sensitive pre-operative criterion as compared to pre-operative ejection fraction to plan the post-operative management of the patient. Patients expected to have a more drop in left ventricular function post-mitral valve replacement can be planned meticulously with a multi-team approach to reduce the morbidity and mortality of the patients.

### Conflicts of Interest

The authors declare no conflict of interest.

### Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Evaluation of Patient Satisfaction with Fixed Prosthodontic Therapy Visiting Prosthodontic Department of a Teaching Dental Hospital

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## ARTICLE INFO

**Key Words:**

Fixed Prosthesis, Satisfaction, Aesthetics, Mastication, Speech

**How to Cite:**

Zubair, N. ., Raza, M. ., Khan, M. S. ., Ubaid, B. ., Alam, A. ., Hashim, L. ., & Ali, Z. (2022). Evaluation of patient satisfaction with fixed Prosthodontic therapy visiting Prosthodontic department of a Teaching Dental Hospital : Patient Satisfaction Towards Fixed Prosthodontic therapy. *Pakistan Journal of Health Sciences*, 3(06).

<https://doi.org/10.54393/pjhs.v3i06.352>

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Received Date: 12th November, 2022

Acceptance Date: 23rd November, 2022

Published Date: 30th November, 2022

## ABSTRACT

One of the important aspects of any successful prosthodontics treatment is the satisfaction level of patients with that particular treatment. Crowns and fixed partial dentures besides fulfilling clinical and laboratory norms must also satisfy the needs of patients. **Objective:** To evaluate satisfaction level of patients with crown and bridge they received in the past. **Methods:** This cross sectional study had a total of one hundred patients (males and females) who were evaluated for the satisfaction level of crown and bridges they received in recent past. Through a convenient sampling technique and present inclusion and exclusion criteria only those patients were considered who presented with the problem other than the existing fixed prostheses under consideration for the study. Self structured questionnaire was used to assess patient's satisfaction on the basis of type of prosthesis used, material of prosthesis, mastication, perceived aesthetics, taste of food and foul smell. Data were analysed through SPSS version 23.0. **Results:** Study had 46 males and 54 females with a mean age of 37 years. Majority of patients presented with metallic ceramic crowns. Approximately 79% patients were found to be comfortable with mastication. Most of the patients (98%) were satisfied with aesthetic while 93% patients did not feel any bad smell. A very small percentage of patients were not satisfied with their taste of food and speech. **Conclusions:** Overall satisfaction of patients on a scale from 1-10 showed that maximum number of patients were found to be satisfied from their previous crown and fixed partial denture treatment.

## INTRODUCTION

Partial edentulism, being highly prevalent oral condition, affects patient daily routine at large. In such conditions patients need replacement of missing teeth in order to enhance masticatory function, esthetic needs, comfort and social wellbeing including patient satisfaction [1-3]. Fixed partial dentures, being economical than implants and without surgical interventions, remains standard care for rehabilitation of short span edentulous spans. Attributes of successful prosthesis like level of comfort, chewing efficiency, integrity and health of dental arches and patient self esteem are enhanced with such replacement therapy [4, 5]. In routine clinical practice, for most of the times, emphasis is focused on mechanical, biological and functional aspects of prosthesis while formulating a

treatment plan for replacement of missing teeth, however, little or no attention is given to the levels of satisfaction and clinical outcomes of such prosthodontics treatment modalities [6]. Patient's satisfaction, acceptance of prosthesis and outcome in-terms of patient perception is important for any successful prosthodontics treatment [7]. Patient satisfactions has been shown to influence compliance and in turn treatment quality [8]. Patient's expectations of prosthetic treatment vary, some patient's priority is to restore masticatory function, while others seek treatment mainly for aesthetic concerns. Patient perceived satisfaction is a multifactorial phenomenon that may vary from different aspects like type of treatment, kind of material used, shade matching,

intraoral condition of patients and skill of practitioners. For this reason various studies have reported a variable range of satisfaction in terms of masticatory efficiency, comfort and esthetics. A number of studies observed a high level of satisfaction with the fixed prosthodontics treatments, ranging from 85% to 91% [9, 10]. Apart from technical and biomechanical aspects of prosthesis a more friendly behaviour of practitioner and supporting staff can also influence the level of satisfaction of patient with regard to the success of dental treatment [11]. Limited information and data is available with respect to patient's satisfaction treated with fixed prosthesis in local area, so this study was designed to assess this important aspect of treatment. The aim of this study was to evaluate the satisfaction of the patients with regards to mastication, aesthetics and phonetics after placement of crowns and fixed partial dentures. The obtained results will be of value to the practitioners in providing a kind of information about the prevailing clinical practices for rehabilitation of partially edentulous arches with fixed partial dentures

## METHODS

This descriptive cross sectional study was carried out at Outpatient Department of a private dental teaching hospital, Peshawar Dental College. The study was conducted from March to June-2022, after obtaining certificate of approval from Institutional Review Board. A total of 100 patients were recruited in the study through convenience sampling technique. Study included both males and females, having age from 15 to 65 years. They were selected on the bases of predetermined inclusion and exclusion criteria. It included patients who had received crown and fixed partial denture in the near past, irrespective of the place where the treatment was obtained. Patients with metal ceramic crowns and fixed partial dentures were included in the study. Patients presenting with chief complaints/ complications with failed crowns and fixed partial dentures were excluded. The aims and objective of the study were explained to the patients. Those found eligible and willing to participate were interviewed using self structured questionnaires which consisted of two parts, first part related to demographic data and second related to type of prosthesis, type of material used, mastication, phonetics, aesthetics, comfort, foul smell and perceived changes in taste. Questionnaire consisted of dichotomous questions and patients responses were recorded and marked accordingly on proforma. Questions also aimed to assess various problems related to prosthesis and to assess overall satisfaction level of patient on a scale from 1 to 10. The results were processed using SPSS version 23.0.

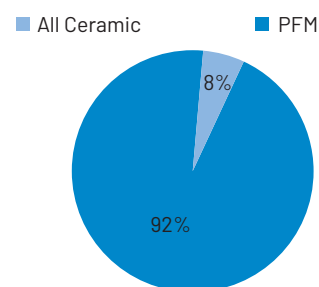
## RESULTS

A total of 100 patients were enrolled in the present study. Out of total recruited patients, 46 were males while 54 were females (Table 1). A male to female ratio of 0.85 was found. Patients had a mean age of 37 years and having a range of 15 to 65 years.

Gender	Male	54 %
	Female	46 %
	Male to Female Ratio	0.85
Age	Maximum	65 years
	Minimum	25 years
	Mean	37 years

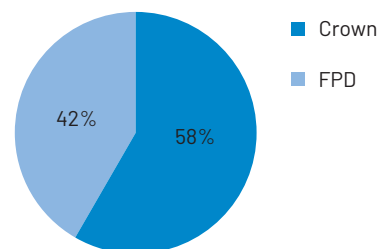
**Table 1:** Gender wise distribution and Age of Patients

It was observed that majority of patients (92%) were having porcelain fused to metal prostheses and the rest were having all ceramic prostheses (Fig-1).



**Figure 1:** Type of material used in prosthesis (PFM= Porcelain Fused to Metal)

Out of the total observed prostheses, 58% were crowns and 42% fixed partial dentures (FPD) as shown in Figure 2.



**Figure 2:** Type of Prosthesis (FPD=Fixed Partial Denture)

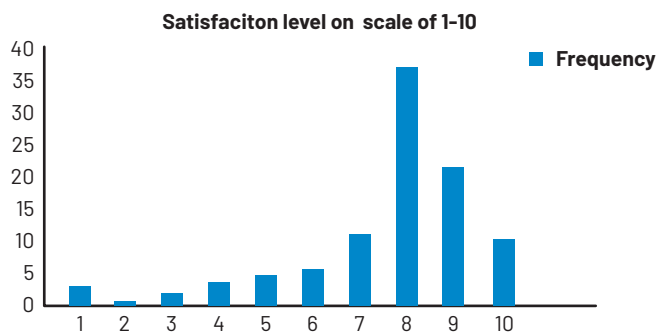
Frequencies of various variables such pain, discomfort and aesthetics showed that approximately 79% of patients were comfortable with mastication after wearing fixed prosthesis while 21% patients were not feeling comfortable with the masticatory performance of their particular prosthesis. As far as pain associated with prosthesis was concerned, majority of patients (80%) felt no pain while 20% patients reported some sort of pain (Table 2). The table also shows the level of satisfaction in relation to aesthetics after fixed prosthesis therapy. Most of the patients (98%) were found to be satisfied with aesthetics while only 2% of patients were unsatisfied with their crown or bridge they received in the past. The study observed that

almost 93% of patients did not feel any bad smell after placement of prosthesis while 7% of them reported bad smell. Almost all of the patients reported no problem as for taste perception with the prosthesis is concerned. A small number of patients (3%) reported difficulty in speech after the provision of fixed prosthesis while 97 patients were found to be satisfied.

Variable	Patient Responses					
	Yes			No		
	Male	Female	Total	Male	Female	Total
Mastication Comfort	43	36	79	11	10	21
Pain with Prosthesis	8	12	20	46	34	80
Esthetics Satisfaction	54	44	98	0	2	2
Bad Smell	5	2	7	53	40	93
Food Taste Change	0	1	1	54	45	99
Speech Difficulty	0	3	3	54	43	97

**Table 2:** Frequencies of responses for various variables

Overall satisfaction of patients on a scale from 1-10 shows that maximum patients were satisfied after receiving crown and fixed partial denture treatment (Figure 3). In ascending order, higher the number on scale the higher is perceived satisfaction level with prosthesis and vice versa.



**Figure 3:** Overall satisfaction on the scale 1-10.

## DISCUSSION

For more than a couple of decades an increase in demand of fixed partial dentures has been observed for prosthodontics rehabilitation of patients having partially edentulous arches. Patients usually prefer a type of replacement prosthesis which is closer to their natural teeth in many aspects like appearance, comfort and functions. These will also have a positive impact on self image of such patients. A good quality treatment must fulfill all realistic requirements and expectations of such individuals and must satisfy their needs. Assessment of patients' perceptions of the type of treatment they received is important in terms of assessing the perceived changes after receiving that particular treatment prosthesis. The performance of any fixed prosthesis is evaluated by measuring treatment outcomes such as masticatory function, facial esthetics, and longevity of prosthesis as well as associated technical complications.

Our study found that preponderance of patients (>85%) were satisfied with their fixed prosthesis. Our finding is somehow close to the study done earlier where it was found that more than 2/3rd of their study populations were satisfied with the expectations from their fixed prosthodontics treatment outcome [12]. An identical level of satisfaction was also mentioned in a couple of other similar kind of studies [13]. The high level of satisfaction observed in various research studies in many countries and regions might be attributed to the fact that such fixed prostheses fulfill most of the required predetermined expectations from patient perspectives. Moreover patients usually compare any kind of replacement prosthesis with their missing natural teeth in terms of esthetics, functions and comfort level. Any prosthesis having features closer to the natural teeth can be assumed to fulfill expectation and satisfaction level of patients. One of the major reasons for seeking prosthodontics treatments for missing teeth by patients is the desire to improve masticatory efficiency. In this regard fixed prosthodontics treatment therapy has satisfied quite a large number of patients, as observed in different studies [14-17]. It is desirable from patient perspective that any replacement prosthesis should have no or minimum effect on phonetics of an individual. Alteration in speech due to dental prosthesis can affect social life of patients [18]. Our study found that patients receiving crown or bridges had a minimal effect on speech and that majority of patients (97%) were found to be satisfied with the treatment they received. Our finding is not in agreement with the study done by Kashbur, where more than half of patient population reported altered phonetics with their treatment prostheses [12]. However our finding is in line with a study done earlier by Geiballa [15]. Patient realistic expectations must be met and treatment should satisfy patient needs. Any fixed prosthesis being considered appropriate from practitioners perspective before cementation, should also satisfy the needs of patients from patient perspective after cementation [19]. One of the reasons for the popularity of porcelain fused to metal fixed restoration is the excellent track record for its acceptable esthetics restoration. Therefore both practitioners and patients prefer such kind of aesthetically satisfactory replacement prostheses. Esthetics being a subjective quality, a disparity regarding the level of satisfaction can be anticipated amongst a certain group of people under consideration. Our study observed that almost all of the investigated people were satisfied from their fixed prosthesis except a small number of participants (2%). However another study, somehow closer to our results, found that more than 90% of patients were found to be satisfied from their esthetic requirements provided by their fixed prostheses [20].

## CONCLUSION

Study concluded that majority of patients were found to be satisfied from their crowns and bridges they received in the past. Most of the satisfaction were found in terms of esthetics.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Biochemical Effects of Oral Contraceptive Pill On Total Serum Protein, Hemoglobin and Antioxidants Capacity among Females Athletes

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## ARTICLE INFO

**Key Words:**

Contraceptive Pills, Total Serum Protein, Hemoglobin, Antioxidants Capacity, Female.

**How to Cite:**

Khan, A. ., Jamil, M. ., Zafar Iqbal Butt, M. ., Chaudhary, A. ., Ahmad Jan, A. ., Selamoglu, Z. ., & Canan Alp, E. . (2022). Biochemical Effects of Oral Contraceptive Pill On Total Serum Protein, Hemoglobin and Antioxidants Capacity among Females Athletes : Biochemical Effects of Oral Contraceptive Pill. Pakistan Journal of Health Sciences, 3(06). <https://doi.org/10.54393/pjhs.v3i06.341>

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Received Date: 11th November, 2022

Acceptance Date: 24th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

Total serum protein, hemoglobin and antioxidant system are essential to the body's physiological activities. Oral contraceptive pills influence the level of proteins of both types present in the blood; thus, it is found to change among pregnant women. **Objectives:** To scrutinize oral contraceptive pills' effects (OCP) on total serum protein, hemoglobin and antioxidant capacity among females. **Methods:** The participants were divided into the experimental group (EG-60) and control group (CG,-24). 5 ml of blood was collected from each subject and marked with a different identification code. The collected blood samples were processed through laboratory protocols, and thus the targeted tests were performed to achieve the desired results. The results of tests were processed through a statistical package for social sciences (SPSS, version-26), and thus appropriate statistical tools were applied for analysis. **Results:** Total number of subjects in both groups were 84. Mean of CG in term of hemoglobin was  $13.91 \pm .92$  and Mean of EG in term of hemoglobin was  $14.18 \pm .84$ . Mean of CG in term of total serum protein was  $6.75 \pm .48$  and Mean of EG in term of total serum protein was  $6.62 \pm .31$ . **Conclusion:** Based on the analysis, the researcher concluded that contraceptive pills significantly affect total serum protein, hemoglobin and antioxidant capacity among females.

## INTRODUCTION

Millions of women around the globe use contraceptive pills (OCP) to avoid unintended pregnancy. Therefore, awareness of the risk and benefits of OCP is essential [1]. Excessive use of OCP causes different health problems. OCP also causes oxidative stress. Oxidative stress refers to an imbalance level of both antioxidants and reactive oxygen Species (ROS) and nitrogen species (NOS); thus, this state negatively influences the antioxidant defence mechanism

[2, 3]. Free radicals are harmful because they retrieve electrons from different molecules, which cause the formation of oxidized forms [4]. Other research studies indicate that oxidative stress may cause various inflammatory, muscular, cardiovascular, and neurodegenerative diseases [4, 5]. Many studies reveal that exercise with maximum volume and intensity induces oxidative stress. In addition, several types of medicine also

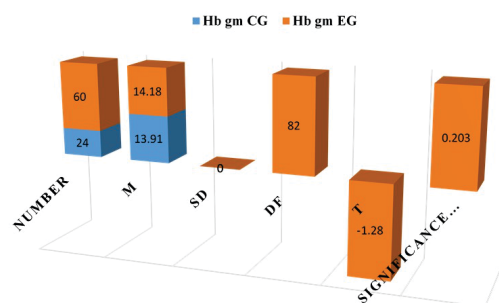
cause oxidative stress. OCP therapy (OCT) among premenopausal women increases oxidative stress, which causes many cardiovascular health problems. It means that OCT may cause adverse effects on vascular functions [6]. Many vivo and in vitro studies have shown that women with HRT observed antioxidant effects of estrogen [7, 8]. It is also reported that both estrogens and progestin cause oxidative stress. Proteins are the building blocks of cells and tissues of the body. It helps grow and develop health [9, 10]. Blood contains two important types of proteins, i.e. albumin and globulin. Both have their functions, as Albumin proteins possess fluid from leaking out of blood vessels, while Globulin proteins play an essential role in the parts of the immune system [10-12]. Total serum protein is the amount of protein present in the blood. It is used to measure the amount of two significant classes of protein present in the blood, i.e. albumin and globulin [13, 14]. OCP pills influence the level of proteins of both types present in the blood; thus, it is found to change among pregnant women [15]. Mostly hemoglobin is a protein in red blood cells that carry oxygen to various body organs and transports carbon dioxide from organs and tissues to the lungs [16, 17]. A low level of hemoglobin indicates anemia, while a high level indicates blood disorder polycythemia vera, smoking and dehydration, and high altitude. Likewise other proteins, OCP affects the level of hemoglobin [18, 19].

## METHODS

The researcher applied the following procedures to achieve the results of the study. The study subjects were comprised of users of OCP (EG=60) and non-user females of OCP (CG=24). Five (05) ml of blood was taken from each subject, and thus different identification code was given to each blood sample. The collected blood samples were processed through laboratory protocols. Therefore the targeted tests (i.e. Ferric reducing assay protocols (FRAP) for antioxidant capacity measurement and LFTS for diagnosing total serum protein and hemoglobin) were performed to achieve the desired results. The ethical and review board of Gomal University, Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan, approved the protocol of this specific research study. The collected facts or data were arranged and examined using mean, standard deviation, frequency and percentage, etc., through a statistical package for social sciences (SPSS, version-26).

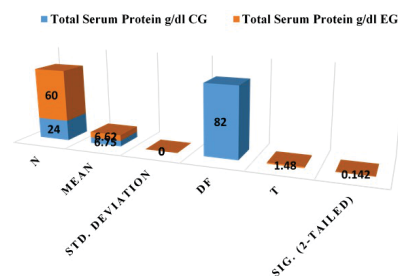
## RESULTS

Figure 1 indicates the total number of subjects in both groups were 84 (CG=24, EG=60) and level of hemoglobin in both groups. Mean (M) and standard deviation (SD) of CG in term of hemoglobin was  $13.91 \pm .92$  and thus Mean (M) and standard deviation (SD) of EG in term of hemoglobin was  $14.18 \pm .84$ , Df was -1.28 and P values was .203.



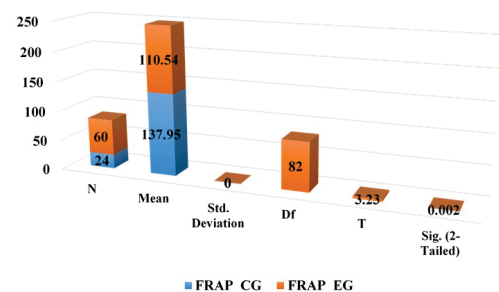
**Figure 1:** Hemoglobin level in both EG and CG

Figure 2 indicates the total number of subjects in both groups was 84 (CG=24, EG=60) and the total serum protein in both groups. The Mean (M) and standard deviation (SD) of CG in term of total serum protein was  $6.75 \pm .48$  and thus Mean (M) and standard deviation (SD) of EG in term of total serum protein was  $6.62 \pm .31$ , Df was -1.48 and P values was 0.142.



**Figure 2:** Level of total serum protein in both EG and CG

Figure 3 indicates the total number of subjects in both groups was 84 (CG=24, EG=60) and oxidative stress in both groups. The Mean (M) and standard deviation (SD) of CG in term of FRAP was  $137.95 \pm .20.87$  and thus Mean (M) and standard deviation (SD) of EG in term of FRAP was  $110.54 \pm .31$ , Df was -82 and P values was .002.



**Figure 3:** Level of oxidative stress in both EG and CG

## DISCUSSION

After a critical assessment of all the above discussion, it is clear that OCP and other medicines affect the physiology of different enzymes and hormones. What are the effects of OCP on hemoglobin and total blood protein and antioxidants system? To discover this fact, the researcher intends to carry out a study titled "Biochemical effects of contraceptive pill on total serum protein, hemoglobin and antioxidants capacity among female athletes. The current result reveals that OCP has significant effect upon

antioxidants capacity. In line with this finding, the study conducted by Adejumo et al indicates that OCP among females' levels of serum antioxidants thus it caused oxidative stress [20]. The study conducted by Khan et al. showed that OCP, as well as other types of vaccination like Covid-19 vaccination, also causes oxidative stress among female athletes [21]. The study indicates that OCP alter the level of hemoglobin. The same finding is drawn by other studies that OCP affects females' menstrual cycle and hemoglobin levels [22, 23]. The result also indicates effects of OCP on total serum protein. This emerging finding is supported by previous finding that OCP alters the blood serum protein level [15, 24].

## CONCLUSIONS

Based on analysis and findings, the researcher concluded that OCP significantly affects total serum protein, hemoglobin and antioxidant capacity among female athletes.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Microbiological Assessment of Raw Milk Available in the Metropolitan City of Sindh, Karachi, Pakistan

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## ARTICLE INFO

## Key Words:

Milk, Microbiological, Quality, Safety, Assessment

## How to Cite:

Zaheer Abbas, S. ., Naseem Khan, M. ., Zehra Naqvi, A. ., Tabassum, N. ., Ali Mirani, Z. ., Basit Khan, A. ., & Ali, R. . (2022). Microbiological assessment of raw milk available in the metropolitan city of Sindh, Karachi - Pakistan: Microbiological Assessment of Raw Milk . Pakistan Journal of Health Sciences, 3(06). <https://doi.org/10.54393/pjhs.v3i06.288>

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Received Date: 27th October, 2022

Acceptance Date: 16th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

Currently, milk quality is judge on its health and hygienic parameters equally as its composition. Raw milk is a rich medium for the growth and proliferation of different pathogenic microorganisms such food-safety hazard may incorporate into the dairy chain, not only affect its safety and quality but also cause various milk borne diseases. **Objective:** To evaluate the microbiological assessment of raw milk accessible in Karachi with the intention to develop risk tracking strategies and its mitigation plan in future. **Methods:** Total 270 raw milk samples were collected from different sites throughout the dairy supply chains in each district of the city. Microbiological assessment of raw milk was carried out by following the bacteriological analytical manual (BAM, FDA) protocol. **Results:** The raw milk safety and quality at the dairy farms were satisfied, except raw milk storage tanks samples. The bacterial count boosted in almost all the samples collected during its transportation, higher aerobic and pathogenic load was observed in the retail shop's samples however, maximum counts were noticed in the selling point milk samples. None of the milk samples contained other pathogens like *Listeria* or *Salmonella*. **Conclusions:** The milk quality of the supply chain, retail shops and storage tanks at dairy farms were un-satisfied based on different microbiological parameters.

## INTRODUCTION

Currently, the milk safety and hygienic parameters are equally judged as its composition due, to the present trends in consumer preferences to use naturally pure or minimally processed raw milk [1, 2]. Normally, raw milk gets contaminated by direct transfer from the blood to the milk through an udder infection called mastitis and post milking contamination occurs during its handling. According to literature review, enterotoxin-producing *Staphylococcus aureus*, human pathogenic verocytotoxin-producing

*Escherichia coli* (VTEC), human pathogenic, *Listeria monocytogenes*, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Leptospira* spp. *Salmonella* spp. etc. are deemed the main microbiological hazards related to raw milk consumption [1]. Milk is a significant source of staphylococcal food poisoning which leads to septicemia, pneumonia, gastroenteritis and dermatitis in humans [3]. *Salmonella* causes illness in human through fecal contamination of food or water [4]. The main source of

human illness is milk and milk products contaminated with *Salmonella* species, that have been considered responsible for causing typhoid fever, enteritis and bacteremia [5, 6]. *E. coli*, a fecal coliform, is an indicator bacterium of unhygienic handling of food. *E. coli* is responsible for a wide range of infections like mild diarrhea, gastroenteritis, septicemia and typhoid fever [7]. *Listeria monocytogenes* is usually present in the dairy farm's soil, manure, plants, water and food chain environment [8]. It can thrive in harsh environment and even in raw milk that has been refrigerated. It can cause mastitis in cow and can be shed in milk of healthy cows [4, 9]. Additionally, improper milk handling, storage and transportation from the farm to the table increases the risk of pathogenic microbial contamination, which has a negative impact on the milk's quality and makes it unhealthy for human consumption [10]. Contaminated or open raw milk is responsible for many zoonotic diseases like hepatitis, typhoid, animal contact disease, influenza, and aerosolized dust illnesses are common in Pakistan due to absence of suitable food standards, unhygienic conditions, poor sanitation, poverty and illiteracy are the main factors contributing to the rise of food-borne illnesses [11, 12]. The inadequate monitoring and ineffective law enforcement, is substantially worse in developing and underdeveloped nations [13]. Therefore, maintaining and control milk quality is one of the big challenges in the dairy sector. Implementing Good Veterinary Practices (GVP), Good Management Practices (GMP), and Good Hygienic Practices (GHP) is crucial to reducing or eliminating the risks [14]. Therefore, this study was designed to evaluate the microbiological assessment of raw milk available in Karachi city with the intentions to develop risk tracking strategies and its mitigation plan in future.

**METHODS**

Raw milk and their complete supply chain within the city were studied to assesses their quality and safety attributes according to different Microbiological Standards as indicated in table 1.

Food	Microorganisms	Standards*		
		1	2	3
Milk	<i>Aerobic Plate Count</i>	105 CFU/mL	2.5x10 <sup>4</sup> CFU/mL	5x10 <sup>4</sup> CFU/mL
	<i>Coliforms</i>	-	10 CFU/mL	5 CFU/mL
	<i>Escherichia coli</i>	-	3/CFU/mL	2 CFU/mL
	<i>Staph. aureus</i>	-	0/mL	0/mL
	<i>Salmonella</i>	0/25mL	0/mL	0/mL
	<i>Listeria monocytogenes</i>	0/25mL	0/25mL	0/25mL

**Table 1:** microbiological parameters of milk assessment

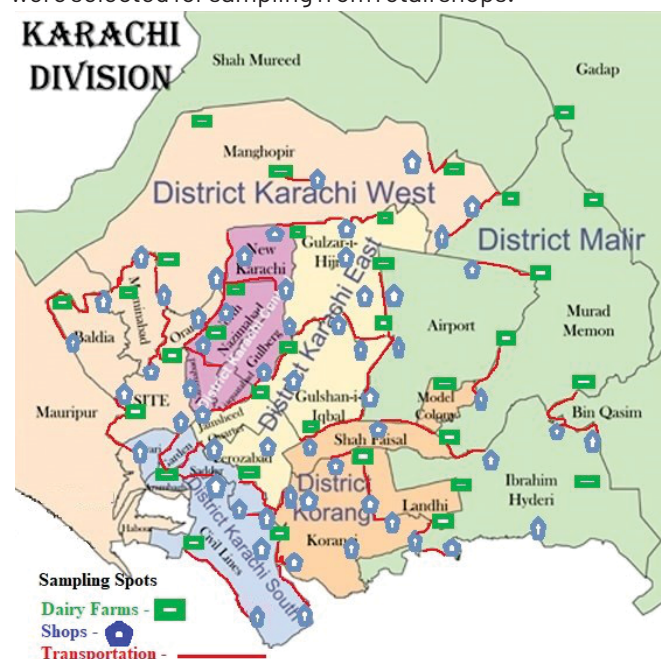
1. The Punjab Pure Food Rules, 2007
2. Australia/New Zealand; Microbiological Limits for Food Standard 1.6.1, issue 78
3. European Commission - Microbiological Criteria for Dairy Products

For the evaluation of the microbiological assessment the dairy supply chains were studied in the five districts of Karachi as shown in figure 1. Total 9 sampling spots were selected throughout the milk supply chain, as specified in the table 2.

Sampling Spots								
Dairy Farm				Transportation		Shop		
1	2	3	4	5	6	7	8	9
Direct from Animal	Milking Jug	Milk Collecting Bucket	Storage Tank	Milk Dispensing Cans	Milk Receiving Cans	Storage Tank	Temporary Storage Tub	Selling Point Tub

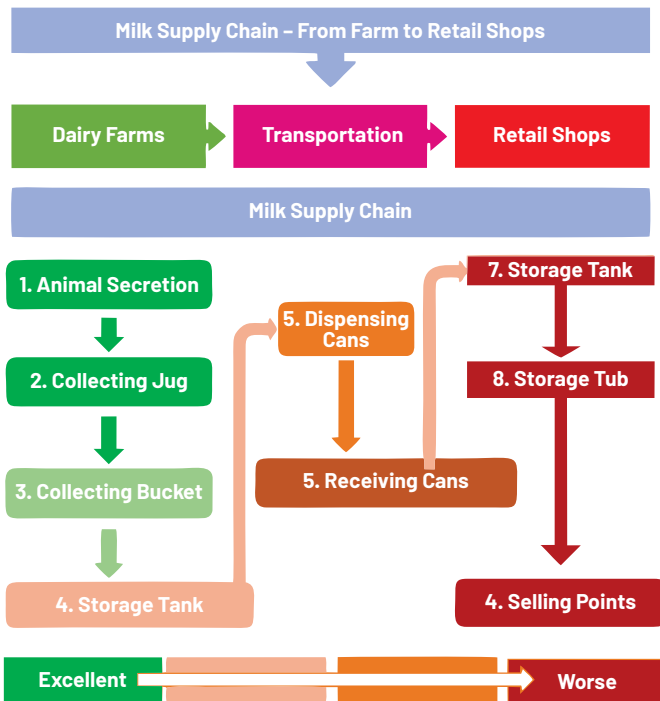
**Table 2:** Raw milk sampling collecting points

Four sampling points were chosen from dairy farms cites, 2 spots were selected during supply chain while, 3 venues were selected for sampling from retail shops.



**Figure 1:** Source: map: dawn gis(November 29, 2015)

Three samples from each sampling point were collected. For sample collection, sterile, clean polythene plastic bags were used. The sample units were quickly and aseptically transferred to the lab in a clean, chilled container after being properly sealed. Most samples were examined for bacteriological examination as soon as they arrived or within 24 hours after being held at 0-4°C. TPC, Staph. aureus, Salmonella, Listeria, Coliforms & E. coli isolates were analyzed in milk samples as per the US FDA (BAM - Ch#01, 12, 05, 10 and 04) protocol. TPC, E. coli and Staph. aureus was enumerated by using (PCA, EMB and BPA) agar respectively by pour plate method while, MPN - Presumptive and Confirmed tests were performed for Coliforms. However, Salmonella and Listeria spp. were analyzed by enrichment and culturing method.



**Figure 2:** Flow chart of complete milk supply chain

For the detection of *Listeria monocytogenes*, 25 ml milk sample was transferred to 225 ml *Listeria* broth having 2.5ml mixture of selective supplement and incubated it for 24 hours at 35 °C. After the incubation 1 ml was transferred to BHI (brain heart infusion) agar plates and incubated for next 48 hours at 35 °C. Similarly, for the *Salmonella* (isolation): 25 ml milk sample was mixed in 225 ml lactose broth and incubated for 24 hours at 35°C. 0.1 ml of the incubated sample was transferred to 10 ml RV (Rappaport Vassiliadis) medium and another 1 ml to 10 ml TT (Tetrathionate) broth. RV medium was incubated for 24 hours at 42 °C and TT broth tubes for 24 hours at 43 °C. A loopful (10 µl) of incubated TT broth was streaked on the BS (Bismuth Sulfite) agar, XLD (Xylose Lysine Deoxycholate) agar and HE (Hektoen enteric) agar plates and incubated for 24 hours at 35°C. Similar, procedure was repeated for incubated RV medium. After incubation the plates were examined.

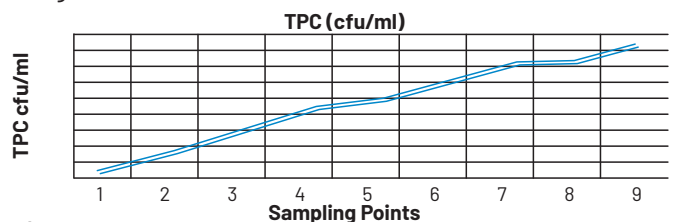
**RESULTS**

Raw milk directly obtained from the lactating animals showed good results when tested for total aerobic count, Coliforms, *E. coli*, and *Staph. aureus*. Average APC 135 CFU mL<sup>-1</sup> and average 2 CFU mL<sup>-1</sup> Coliforms were observed in samples taken from milk collection jugs at all dairy farms. It is illustrated that average 3.9x10<sup>3</sup> CFU mL<sup>-1</sup> APC, 8 CFU mL<sup>-1</sup> Coliform and 5 CFU mL<sup>-1</sup> *Staph. aureus* count was observed in the collecting buckets samples. The total bacterial count was under the limitation however Coliforms and *Staph. aureus* counts slightly exceeded the limitation

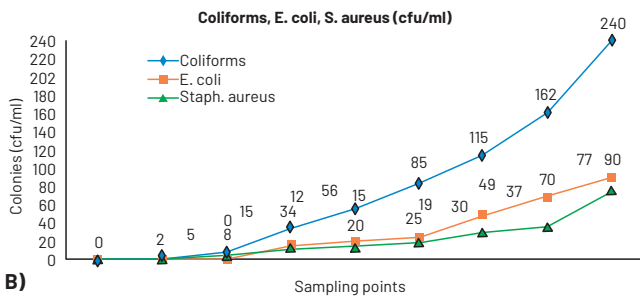
as shown in the table 3, on the bases the raw milk at this point was of marginally acceptable quality. Milk samples from bulk storage tanks at dairy farms had a high microbiological count, with an average of 2.1x10<sup>5</sup>CFU mL<sup>-1</sup> APC, 34CFU mL<sup>-1</sup> Coliforms, 15CFU mL<sup>-1</sup> *E. coli* and 12CFU 25mL<sup>-1</sup>*Staph. aureus* detected.

Organisms	Sampling Points								
	Dairy Farms			Supply Chain		Retail Shops			
	1	2	3	4	5	6	7	8	9
APC	2	135	3.9x10 <sup>3</sup>	2.1x10 <sup>5</sup>	4x10 <sup>5</sup>	5.8x10 <sup>6</sup>	7.8x10 <sup>7</sup>	9.9x10 <sup>7</sup>	8.5x10 <sup>8</sup>
Coliforms	0	2	8	34	56	85	115	162	240
<i>E. coli</i>	0	0	0	15	20	25	49	70	90
<i>S. aureus</i>	0	0	5	12	15	19	30	37	77

**Table 3:** Microbiological assessment (cfu/ml) of raw milk from farm to shops. 1; Direct Animals 2; Milk Collecting Jug 3; Milk Collecting Bucket 4; Bulk Storage Tank, 5; Dispensing Cans, 6; Receiving Cans 7; Storage Tank 8; Milk storage tub 9; selling point. Since the count was beyond the defined microbiological parameters, the milk's quality was at this point was of poor quality. Further, boosted microbial count was recorded in milk samples collected during transportation the average APC counts 5.8x10<sup>6</sup>CFU mL<sup>-1</sup> was noted in the milk supply cans, as average 85 CFU mL<sup>-1</sup> Coliforms, 25 CFU mL<sup>-1</sup> *E. coli* and 19 CFU mL<sup>-1</sup> *Staph. aureus* counts were shown in the shipment cans milk samples. The microbiological limits breached at these point and hence milk quality was account as of unacceptable quality. Average 7.8x10<sup>7</sup>CFU mL<sup>-1</sup> APC count was noted in the retail shops storage tank milk samples while average 115 CFU mL<sup>-1</sup> and 49 CFU mL<sup>-1</sup> Coliforms and *E. coli* count was noted respectively while, 19 CFU mL<sup>-1</sup> *Staph. aureus* load was observed in the storage tank milk samples at the retail shops. These sites were judged to have poor milk quality because of the excessive bacterial growth in the samples. The retail shops selling point milk samples had the highest level of bacteria. As average 8.5x10<sup>8</sup>CFU mL<sup>-1</sup> APC, 240CFU mL<sup>-1</sup> Coliforms, 90CFU mL<sup>-1</sup> *E. coli* and 77CFU mL<sup>-1</sup> *Staph. aureus* count was recorded in the selling points milk samples. The count was beyond the acceptable bacterial limits, therefore, the quality of milk was declared unacceptable according to the microbiological criteria as shown in table 01. The average APC, Coliforms, *E. coli* and *Staph. aureus* count in milk samples from direct animals to selling points is illustrated in figure 3.



A)



**Figure 3:** Average bacterial count at each sampling points  
 A) Average TPC count in milk samples collected from direct animals to the selling points at shops B) Average Coliforms, E. coli and Staph. aureus count in milk samples collected from direct animals to the selling points at shops

## DISCUSSION

Raw milk is a perfect medium to support the growth and proliferation of different bacteria [15]. Milk samples collected from direct animals were almost free of microorganism (average TAPC; 2CFU/mL) this indicates that there is no inherent danger of bacterial contamination in dairy farm animals [16]. The majority of the dairy farms milk samples collected from storage tank showed exceeded microbiological limits (average APC;  $2.1 \times 10^5$  CFU/mL APC, 8 CFU/mL Coliforms, 5CFU/mL Staph. aureus) due to lack of cooling systems, non-implementation of good management practices (GMP) and good hygiene practices [14, 17]. Likewise, the leading microbial flora associated with raw milk samples in and around were in the order of aerobic count > Coliforms > Escherichia coli > Staphylococcus aureus among the isolated pathogens. The existence of these bacteria in milk reflects the various sources of contamination such as animal, human, environment, utensils etc. [18]. The majority of the milk supplied to the city is transported mainly from Bhains Colony [15]. The delivery of milk from a great distance at ambient temperature encourages the growth and proliferation of bacteria. According to reports, lack of refrigeration and lengthy transportation lead to contamination in the milk supply chain [19]. The milk samples taken from bulk milk supply cans had a high bacterial counts (average APC;  $5.8 \times 10^6$  CFU/mL, Coliforms 85CFU/mL; E. coli 25CFU/mL; Staph. aureus 19CFU/mL). These high counts are related to improper milk handling practices, contamination from animal bedding, mixing of normal milk with milk taken from an animal with an infected udder, etc. Total bacterial, Coliform, E. coli and Staph. aureus count in milk samples collected from supply chain were beyond the acceptable limits [15]. The overall bacterial count in milk storage tanks without refrigeration and with refrigeration ( $-4^\circ\text{C}$ ) at uncontrolled temperature at various retail stores were high (average APC;  $7.8 \times 10^7$  CFU/mL, Coliforms 115CFU/mL; E. coli 49CFU/mL,

Staph. aureus 30CFU/mL) highlights the same risks like lack of training for the staff, cleaning and disinfection plans, the absence of a waste management strategy and a failure to adhere to temperature limitations are all examples of noncompliance [20]. Milk samples collected from shop's selling points had high microbial count (average APC;  $8.5 \times 10^8$  CFU/mL, Coliforms 240CFU/mL; E. coli 90CFU/mL, Staph. aureus 77CFU/mL) its high number might be linked to the milk being collected in an unsanitary manner and being handled carelessly during transportation. Moreover, coliforms contaminated water in milk during transportation could be possible reason of its high count[15]. Although, the overall milk quality at the retail shops were unacceptable as it strongly exceeded the microbiological parameters of both national and international standards.

## CONCLUSIONS

It could be concluded that the raw milk sold in Karachi at retail stores is of poor microbiological quality and is unsafe for human consumption because it contains pathogenic bacteria, which are responsible for a number of food-borne illnesses. A possible risk to consumer health is indicated by the high bacterial count and the presence of several pathogenic microorganisms. Overall, Karachi's raw milk is of poor quality for human consumption. It is therefore, significantly important to ensure high quality raw milk production under good hygienic conditions, beside this an effective sanitary and hygienic measures must be implement during milk handling, transportation and marketing to ensure its safety.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Hydro-dissection: An Effective Intra-Operative Technique for Difficult Laparoscopic Cholecystectomies

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## ARTICLE INFO

**Key Words:**

Cholecystectomies, Laparoscopic, Hydrodissection

**How to Cite:**

Ali, A. ., Saeed, S. ., Shahid, N. ., Ahmed Qureshi, J. ., Ahmed, M. ., & Salam, A. . (2022). Hydro-dissection: An Effective Intra-Operative Technique for Difficult Laparoscopic Cholecystectomies: Hydro-dissection for Difficult Laparoscopic Cholecystectomies. *Pakistan Journal of Health Sciences*, 3(06). <https://doi.org/10.54393/pjhs.v3i06.338>

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Received Date: 7th November, 2022

Acceptance Date: 22nd November, 2022

Published Date: 30th November, 2022

## ABSTRACT

Hydrodissection, a technique used to treat nerve entrapments, involves injecting an anaesthetic, saline, or 5% dextrose in water to separate the nerve from the surrounding tissue.

**Objectives:** To assess the efficacy of this technique in all patients undergoing difficult laparoscopic cholecystectomy in terms of operative time, haemorrhage, and intra-operative complications. **Methods:** A multicenter observational study was conducted at the department of surgery, PAF Faisal Hospital and Anis Bantva Trust Hospital Karachi. A total of 219 patients were included in this study who underwent laparoscopic cholecystectomy for symptomatic gall stones, with age ranging from 18-70 years, with intra-operative Cuschieri classification >1, using a non-probability sampling method. **Results:** This study included 219 patients from hospital records categorized as per intra-operative difficulty grading of Cuschieri from grade II-IV. The mean age of patients was 40.46 ±12.50 years, with an average duration of symptoms of 16.95 ± 8.73 days. There were 160 (73.1%) males and 59 (26.9%) females. About two-thirds of patients were admitted through the emergency department. The pre-operative and intraoperative diagnosis of patients was symptomatic cholelithiasis 76 (34.7%), acute on chronic cholecystitis (27.9%), chronic cholecystitis 57 (26.0%), empyema and mucocele gallbladder 11 (5%) each, and Gangrenous gallbladder 3 (1.4%) were recorded. **Conclusion:** This study showed a clear association of intra-operative complicated anatomy during laparoscopic cholecystectomy to its conversion to open cholecystectomy. Techniques of dissection are of significant importance to minimize injuries to vital structures.

## INTRODUCTION

In this contemporary era, laparoscopic cholecystectomy (LC) is a gold standard procedure performed electively and in emergencies for symptomatic gall stones. The increased demand for laparoscopic is of a shorter hospital stay and fewer complications. However, a problematic gallbladder may lead to bile duct injury, increasing conversion into open/standard cholecystectomy [1]. The bile duct injury is the main complication of this surgical procedure. The incidence in open cholecystectomy has been documented at 0.2% compared to laparoscopic cholecystectomy, reported to be 0.1% -1.5% [2, 3]. The most common reason for bile duct injury is the misidentification of common bile

duct as cystic duct or artery, and the importance of a "critical safety view" (CVS) has been guided by Strasberg et al. 2017 [4]. CVS comprises three components: gallbladder Hilum is devoid of connective tissue, just two structures accessing the gallbladder, and at least one-third of the gallbladder is mobilized from the cyst plate. Nevertheless, only about one-third of patients meet the CVS criteria [5]. A study reported that misidentification of structure in the Calot's triangle (92.7%) by the surgeons was the primary reason for bile duct injury leading to higher rates of morbidity following laparoscopic cholecystectomy [6]. Alfered Cuschieri (1990) proposed a classification

stratifying the complicated laparoscopic cholecystectomy based on anatomic and intraoperative findings [7]. Numerous studies have shown adequate human tissue dissection using water jet streams in various medical and surgical procedures [8, 9]. In Laparoscopic cholecystectomies, where anatomy is not clear to dissect, hydro-dissection has shown promising results [10]. In 1998, Naude et al. reported that the hydro dissection technique during laparoscopic cholecystectomy reduces the chances of intraoperative hemorrhage, gallbladder rupture, stone spilling, and operative time [11]. We also believe that hydro dissection can effectively clear the obscure anatomy during laparoscopic cholecystectomy. Previously this technique is used fairly in cases where anatomy is obscure by adhesions and mostly in acute settings. However, no comprehensive data is available to show the superiority of this technique. This technique should be taught from the beginning of surgical training to achieve optimal outcomes of laparoscopic surgical procedures and avoid dreaded complications like bile duct injury. We set out to evaluate the efficacy of this technique in all patients undergoing difficult laparoscopic cholecystectomy in terms of operative time, haemorrhage, and intra-operative complications.

## METHODS

This multicenter observational study was conducted at the department of surgery, PAF Faisal Hospital/ Fazaia Ruth Pfau Medical College, Anis Bantva Trust Hospital, Karachi. The data were collected prospectively from the hospital database after approval from the institutional ethical committee, from 1st September 2021 to 28th February 2022. Total 219 number of patients were included in this study who underwent laparoscopic cholecystectomy for symptomatic gall stones, with age ranging from 18-70 years, with intra-operative Cuschieri classification >1 was included in this study, using a non-probability sampling method. In contrast, those who were Cuschieri grade I or associated with Common bile duct calculi were excluded. Demographic characteristics such as age, gender, diagnosis, intra-operative difficulty as per Cuschieri grading were extracted from the hospital record after approval from the ethical review committee of the hospital. All procedures were performed by qualified general surgeons in their department. Hydrodissection techniques were used in all cases and outcome variables including operating time, length of hospital stay, conversion to open cholecystectomy, other complications were recorded in the proposed proforma. The water stream under high pressure is called hydro jet in 1000ml saline bag with inflatable cuff around to create a pressure of 250 mmHg to 300 mmHg. Hydrodissection is a technique in which

injection of 50 mL or more of saline between tissue spaces was injected to create an edematous area, allowing delineation of tissue planes to ease excision with fewer chances of bleeding [11]. The data were entered and analyzed using Statistical Program of Social Sciences ver. 20.0 (SPSS version 20.0). Mean with standard deviation, frequency, and percentages are calculated for continuous and categorical variables, respectively. Cross-tabulations were formulated. The Chi-square test and Fischer's exact test were run to determine any significant relationship/association. P-value <0.05 was considered significant.

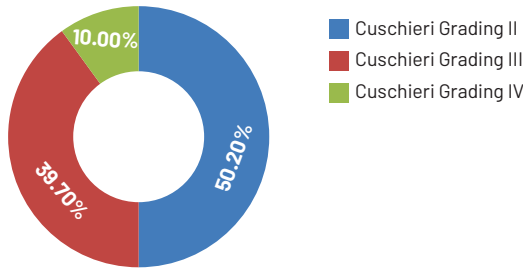
## RESULTS

This study included 219 patients from hospital records categorized as per intra-operative difficulty grading of Cuschieri from grade II-IV. The mean age of patients was  $40.46 \pm 12.50$  years, with an average duration of symptoms of  $16.95 \pm 8.73$  days. There were 160 (73.1%) males and 59 (26.9%) females. About two-thirds of patients were admitted through the emergency department. The pre-operative and intraoperative diagnosis of patients was symptomatic cholelithiasis 76 (34.7%), acute on chronic cholecystitis (27.9%), chronic cholecystitis 57 (26.0%), empyema and mucocele gallbladder 11 (5%) each, and Gangrenous gallbladder 3 (1.4%) were recorded as shown in table 1.

Variables ( n= 219)		Mean $\pm$ SD/Frequency (%)
Age (21-66 years)		40.46 $\pm$ 12.50
Gender	Male	160 (73.1%)
	Female	59 (26.9%)
Duration of symptoms (days)		16.95 $\pm$ 8.73
Mode of Admission	OPD	58 (26.5%)
	ER	161 (73.5%)
Diagnosis (pre-operative + Intraoperative)	Symptomatic Cholelithiasis	76 (34.7%)
	Chronic Cholecystitis	57 (26.0%)
	Acute on chronic Cholecystitis	61 (27.9%)
	Empyema Gallbladder	11 (5%)
	Mucocele Gallbladder	11 (5%)
	Gangrenous Gallbladder	3 (1.4%)
Duration of Surgery (minutes)		16.95 $\pm$ 8.73
Hospital stay (hours)		
Lap converted to open	Yes	17 (7.8%)
	No	202 (92.2%)

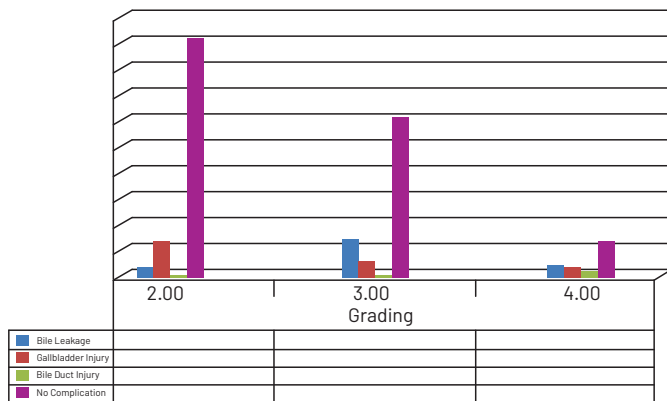
**Table 1:** Descriptive analysis of the data.

According to Cuschieri Grading of intraoperative difficulty, 110 (50.2%) patients were of Grade II, 87 (39.7%) were of Grade III, and 22 (10%) of patients were recorded as grade IV; as shown in figure 1.



**Figure 1:** Frequency of intra-operative complex cases as per Cuschieri Grading

The mean duration of surgery was  $75.82 \pm 22.34$  minutes. The Intra-operative complication in patients is recorded with bile leakage (10%) of cases, gallbladder injury in (12.3%), and common bile duct injuries (0.9%) of patients. Furthermore, the stratification of complications as per difficulty grading is shown in figure 2.



**Figure 2:** Stratification of intraoperative complications

Out of 219 patients, 202 (92.2%) patients were operated laparoscopically, and only 17(7.8%) patients were converted to open cholecystectomy. The conversion of the cases as per grading shows 50% of grade IV cases converted to open while remaining were treated laparoscopically. The Pearson's chi-square test shows a significant association of intra-operative difficulty with conversion to open cholecystectomy as shown in table 2.

Laparoscopic conversion into Open Cholecystectomy	Cuschieri Grading			p-value
	II	III	IV	
YES	0	7	10	< 0.00001.
NO	109	81	12	

**Table 2:** Association of conversion to open cholecystectomy with intra-operative difficulty

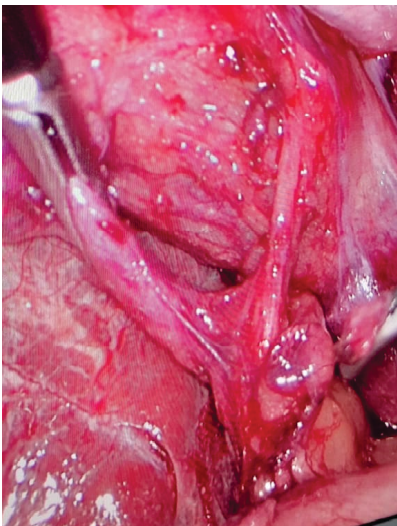
## DISCUSSION

Laparoscopic procedures usually take longer than open, and intra-abdominal adhesions make it more challenging as anatomy is obscure. Hydro-dissection and hydro jet streams are documented to break adhesions and improvise visualization of anatomical planes to assist tissue dissection. Hydro-dissection has been used for the last 25 years for complex laparoscopic procedures,

especially gallbladder [12, 13]. In our study, a total of 219 patients were included who were categorized according to intra-operative difficulty grading of Cuschieri. Our study concluded that obscure anatomy leading to intraoperative difficulty is more prevalent in males than females with an approximate ratio of 3: 1 as compared to other similar studies, which correlates with male preponderance in difficult laparoscopic cholecystectomy [14,15]. About 3/4th of the studied population were admitted through the emergency department with a frequency of preoperative and intraoperative diagnosis of symptomatic cholelithiasis (34.7%), acute on chronic cholecystitis (27.9%), chronic cholecystitis (26.0%), empyema gallbladder and mucocele gallbladder 5%, and gangrenous gallbladder (1.4%) respectively. Agarwal et al. studied preoperative risk factors associated with predictive difficult laparoscopic cholecystectomy revealed that repetitive attacks, prolong duration of symptoms, and male gender are associated with higher grades of adhesions and intra-operative difficulty [16]. In our study, the average time of symptoms was  $16.95 \pm 8.73$  days which may be correlated with higher pain tolerance of the male gender compared to their counterpart. All patients underwent laparoscopic surgery using hydro-dissection or hydro-jet stream injection to clear the obscure anatomy, thereby facilitating dissection with a mean operative time of  $75.82 \pm 22.34$  minutes comparable to other studies in the literature [14]. However, none has included difficulty grading as in our research and used hydro-dissection as a method of surgical dissection of difficult gallbladder. Hydro-dissection by either injecting saline in between tissue planes or using small jet propulsion techniques to separate adhesions from organs has been used in all open surgeries and laparoscopic surgeries. It is a way of blunt dissection to minimize damage to the organs and bleeding. We used 50 ml – 500 ml of warm normal saline in jet propulsion to break adhesions surrounding the Calot's triangle to improve better visualization and safe clipping of the cystic duct and the cystic artery, using a standard suction irrigation port. Following saline jet adhesion-lysis, we remove fluid from the peritoneal cavity to prevent complications associated with fluid overload and sepsis. Intra-operative complications such as common bile duct (CBD) injury in our study are recorded as 0.9% which is comparably lower than 1.4% in the literature [17]. The most challenging anatomy (Cuschieri grade IV) cases, which usually ended up in open cholecystectomy; however, in our observational study, about 50% of patients were managed laparoscopically. Hence, proving the importance of the hydro-dissection technique as a novel technique to improve surgical outcomes in difficult laparoscopic cholecystectomies by reducing complications and less dissection time. The



hydro-jet technique is superior to the diathermy, blunt or sharp dissection. Moreover, it becomes difficult to use diathermy hemostasis within tissues saturated with saline. Temperature and volume need to be monitored carefully to avoid hypothermia. Hydrodissection is another form of saline/water tissue dissection where a one off fixed amount of saline/adrenaline solution is injected into adherent tissues to create water logging, leading to separation of tissues along bloodless natural planes (figure 3) [13]. The disadvantages are that there is no pressure or jet and the flow is not continuous. According to a previous investigation the HD techniques feasibility in a porcine study was valid but failed in human study for showing routine efficacy, simple cholecystectomy. The HD group had quicker and cleaner dissections in the operating field [18]. Other studies suggested that HD technique could be utilized in laparoscopic cholecystectomy. HD used in laparoscopic cholecystectomy of 55 patients were categorized into different groups depending on the determination of surgical difficulty level using Cuschieri Scale [19]. The anatomy of all patients were clearly and effectively visualized as demonstrated by their results. Sharp dissection was needed in some patients for complete procedure. According to a previous study conducted on 133 patients underwent laparoscopic cholecystectomy using HD reported that liver cirrhosis could be dissected by retrograde and prograde dissections [20]. Another study found a decrease in occurrence of GB damages, blood loss, and dissection times [21]. In Multi-Stream Saline Jet (MSSJ), we use physiological normal saline that is readily available and inexpensive. It cleanses body systems, dilutes any blood, encourages hemostasis, and is readily absorbed. Dissection is faster, because one can visualize anatomical bloodless tissue planes more readily.



**Figure 3:** Critical view of safety Hydrodissection

## CONCLUSIONS

This study shows a clear association of intra-operative complicated anatomy during laparoscopic cholecystectomy to its conversion to open cholecystectomy. Techniques of dissection are of significant importance to minimize injuries to vital structures. Hydro-dissection is proved to be a safer and effective technique to overcome the complex anatomy, thereby limiting complications.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Influence of Phacoemulsification on Pre-Operative and Post-Operative Intraocular Pressure

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## ARTICLE INFO

## Key Words:

Pupil Size, Instilling Nepafenac, Phacoemulsification, Cataract

## How to Cite:

Ayub, M., Riaz, R., Rashid, M., Shoukat, T., Mujahid, M., & Anwar Faridi, T. (2022). Influence of Phacoemulsification On Pre-Operative and Post-Operative Intraocular Pressure: Phacoemulsification On Pre-Operative and Post-Operative Intraocular Pressure. *Pakistan Journal of Health Sciences*, 3(06).<https://doi.org/10.54393/pjhs.v3i06.312>

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Received Date: 2nd November, 2022

Acceptance Date: 19th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

Various geographic regions have different ocular disease spectrums. It relies on the area's geographic position, economic situation, cultural diversity, and ethnic integrity. Visual impairment (VI) affects 624 million people worldwide, including 19 million children. Due to decreased productivity, blindness has a major financial impact on the individual, family, and society. **Objectives:** To compare the effect of phacoemulsification surgery and to determine the mean decrease in pupil size after instilling nepafenac 0.1% (preoperative IOP vs postoperative IOP). **Methods:** This study was conducted on 120 patients from period 2016-2017, who have given nepafenac 3 drops per day (steroid anti-inflammatory drops) one day prior to surgery. The pupil size was measured with a caliper; immediately before (preoperative) and at the end of surgery (postoperative). The difference between pupillary diameters was noted and the decrease in pupil size was calculated. **Results:** The mean age was  $52.53 \pm 7.20$  years in the given population. There were 42 (35%) males and females were 78 (65%). The preoperative measurement of the pupil size was  $7.13 \pm 1.06$  mm which was reduced to  $6.27 \pm 1.34$  mm at end of surgery. The mean decrease in pupil size was  $0.86 \pm 0.46$  mm. There was significant decrease in pupil size from baseline (preoperative) measurements than after the surgery ( $p < 0.05$ ). **Conclusion:** It is concluded that nepafenac 0.1% during phacoemulsification surgery can be beneficial in maintaining mydriasis in eyes of patients.

## INTRODUCTION

Visual impairment (VI) affects 624 million people worldwide, including 19 million children. Due to decreased productivity, blindness has a major financial impact on the individual, family, and society [1]. Since almost 20 years ago, the World Health Organization (WHO) has prioritized the prevention of blindness through its programme, which it runs in conjunction with the International Agency Blindness Prevention (IAPB). The fundamental idea behind this policy is that if the services are made available, up to 80% of blindness can be avoided [2]. Cataract is a clouding

of the lens that results in a decrease in vision [3]. Cataracts commonly present gradually and damage one or both eye [4]. Blurred vision, dullness or diplopia, inability to open eyes in light, difficulties with strong light, and difficulty seeing in the dark are all symptoms [5]. In the vast majority of patients, cataract removal with intraocular lens (IOL) implantation is a common approach of recovering eyesight [6]. While extracapsular cataract extraction is still one of the most often utilized procedures in Pakistan, it is gradually being superseded by phacoemulsification [7], a

minimally invasive, suture-free approach for removing cataracts and implanting IOL [8]. The cornea's endothelium is a layer of cells in the posterior (inner) section of the cornea [9]. Nuclear sclerosis includes malnutrition, low socioeconomic status, and poor education regarding progression [10]. The combination of nuclear sclerosis type of cataract and aging was demonstrated in the Age-Related Eye Disease Study (AREDS) [11]. Studies prove that cases taking vitamin C supplements have advanced situations of eyelid development [12]. In this study researchers compared the effect of phacoemulsification surgery to determine the mean decrease in pupil size after instilling nepafenac 0.1% (preoperative IOP vs postoperative IOP).

## METHODS

It was a quasi-experimental study conducted on 150 eyes. The patients with cataract between age of 40-65 years were selected for the study. The patients with previous intraocular surgery including YAG iridotomy, filtration surgery, dystrophy, opacity (seen by slit lamp examination), synechial angle closure more than 180 degrees and inflammatory eye disease (seen by slit lamp examination) were excluded from this study. After approval from Ethical Research Board, Services Institute of Medical Sciences/ Services Hospital, total 150 patients fulfilling inclusion criteria were enrolled by obtaining the medical record of patients admitted in Eye ward. Written informed consent was taken from each participant. Sociodemographic information like name, age, and gender were recorded. Preoperative complete ophthalmic examination was performed by measuring intraocular pressure (IOP) with Goldmann Applanation Tonometer. Proper sterile precautions were taken to prepare the area for surgery, including use of antiseptics like povidone-iodine. Sterile drapes, gowns and gloves were employed. A plastic sheet with a receptacle helped to collect the fluids during phacoemulsification. An eye speculum was inserted to keep the eyelids open. The surgeries were performed by using retro-bulbar anesthesia. An incision with 2.75-mm keratome blade was made on cornea by clearing temporal lobe and the viscoelastic material (USA) was filled in the anterior chamber was filled. Then, continuous phacoemulsification using an Infiniti Vision System (Alcon, USA) was performed consecutively by inserting a foldable intraocular lens (RayOne Cflex, Rayner) into the capsular bag. After the viscoelastic material removal, the stromal hydration was used for incision closure. Then, 0.3% Tobramycin eye drops and 0.1% Dexamethasone eye drops were instilled four times a day and gradually decreased over one month after the surgery. The data was entered and analysis was carried out by using the software SPSS

version 26.0. The variables analyzed were age, gender and intraocular pressure. The quantitative data like age was presented with simple descriptive statistics like mean and standard deviation. The descriptive data like gender was presented as frequency and percentage. The changes in intraocular pressure and pupil size were presented as mean and standard deviation and paired sample test was performed to compare continuous variable like IOP and pupil size changes in preoperative and postoperative measurements. The comparison for reduction in pupil size with age was analyzed by independent sample t test p-value  $\leq 0.05$  was considered statistically significant.

## RESULTS

A total 150 patients were included in this study. About 30 cases were excluded from the study due to non-compliance and follow-up issues. Baseline characteristics are shown in (Table 1).

Parameters	Minimum (n=120)	Maximum (n=120)	Mean $\pm$ SD
Age (years)	40	65	52.53 $\pm$ 7.20
Pupil Size (mm)	0.1	2.0	0.86 $\pm$ 0.46

**Table 1:** Descriptive parameters in cataract patients

The mean follow-up for pupil size was 7.13  $\pm$  1.06 mm before the surgery and was 6.27  $\pm$  1.34 after the surgery which was statistically significant and comparison of decreased pupil size (Mean  $\pm$  SD 0.952  $\pm$  0.47 in age group of 40-50 and Mean  $\pm$  SD 0.796  $\pm$  0.44 in age group of 51-65 years) was insignificantly reduced between two age groups (40-50 and 51-65 years) with p-value 0.064 (Table 2).

Parameters	Pupil Size (mm) N=120		
		Mean $\pm$ SD	p-value
Age groups (years)	40-50 years	0.952 $\pm$ 0.47	0.064
	51-65 years	0.796 $\pm$ 0.44	
Measurement of Pupil Size During Surgery	Preoperative	7.13 $\pm$ 1.06	0.000
	Postoperative	6.27 $\pm$ 1.34	
Gender	Male	0.92 $\pm$ 0.45	0.306
	Female	0.83 $\pm$ 0.46	

**Table 2:** Comparison of decrease in pupil size in different parameters.

On the other hand, pupil size reduction was insignificantly associated with gender distribution ( $p > 0.05$ ). The mean preoperative intraocular pressure (IOP) was 18.63  $\pm$  1.80 mmHg and after 24 hours of surgery; the postoperative IOP was 15.21  $\pm$  1.98 mmHg. There was statistically significant reduction in IOP after surgery (P 0.000) (Table 3).

IOP (mmHg) Score	Preoperative IOP	Postoperative IOP	Mean Reduction in IOP	P-value
Mean $\pm$ Standard Deviation	18.63 $\pm$ 1.80	15.21 $\pm$ 1.98	3.42 $\pm$ 2.87	0.000*

**Table 3:** Measurement of intraocular pressure (IOP) during the phacoemulsification surgery in cataract patients.

\*P-value  $< 0.05$  considered statistically significant

## DISCUSSION

Nearly half (47.8 or 17.7 million) of all cases of blindness are due to cataracts, which continue to be the major cause of blindness widely [13]. Cataracts are treated surgically, which is a largely provident surgery with a good chance of restoring vision [14]. To diminish the "backlog" of cataract surgeries, there has been a global action (VISION 2020 the Right to Sight) to increase the number of cataract surgical procedures [11, 15]. Globally, it's projected that 15 million cataract surgeries are carried out annually, an increase in 5 million from just five times ago [16]. According to study conducted by Memon between 1987 and 1990, cataracts regard for 66 of blindness cases in Pakistan [13, 17]. The plan emphasized the demand for a significant expansion of cataract surgery services. Dick et al., showed that cataract is still the most common cause of age related eye conditions [18]. Jacobi et al., found that ciliary body was moved forward by the enlarging lens, which caused the tendons to relax and the space between trabecular plates to constrict. As the lens enlarges, the anterior lens capsule is displaced forward, causing the zonules to apply antecedently directed traction on the ciliary body and uveal tract [19]. In the first many days after surgery, phacoemulsification constantly causes low grade inflammation. This could reduce IOP by either reducing ciliary body waterless product, as in uveitis, or by adding exodus, like in picky ray trabeculoplasty or with prostaglandin analogues. Shingleton et al., found that following cataract surgery, there has been substantiation of lower intraocular pressure (IOP) in eyes without glaucoma. In discrepancy to our disquisition, that the mean IOP 24 hours after study was advanced than pre-op. [20]. The average IOP was 14.53.4 mm Hg before surgery, and it was 17.06.0 mm Hg 24 hours latterly.

## CONCLUSIONS

Our study has concluded that intraocular Pressure was reduced after twenty-four hour of surgery than preoperative IOP in patients after phacoemulsification. It has been concluded that nepafenac 0.1% during phacoemulsification surgery can be beneficial in maintaining mydriasis in eyes of patients.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Ultrasound Guided Hydrostatic Versus Open Reduction in Intussusception

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## ARTICLE INFO

## Key Words:

Ultrasound-guided Hydrostatic Reduction, Open Reduction, Intussusceptions, Successful Reduction, Recurrence, Hospital Stay

## How to Cite:

Hameed, S. ., Haider, N., Rehman, W. U. ., Hashim, I. ., Ahmed, A. ., Shahbaz, F. ., & Saleem, M. . (2022). Ultrasound Guided Hydrostatic Versus Open Reduction in Intussusception: Ultrasound Guided Hydrostatic Reduction. *Pakistan Journal of Health Sciences*, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.370>

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Received Date: 14th November, 2022

Acceptance Date: 27th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

The surgical and nonsurgical technique has been utilized to manage intussusception. Surgical management of intussusceptions involves open laparotomy along with manual reduction. The non-surgical technique, Ultrasound-guided hydrostatic reduction (USGHR) is a renowned alternative technique for intussusception reduction. **Objective:** To compare the ultrasound-guided hydrostatic reduction versus open reduction for the management of intussusception in terms of successful reduction, recurrence, and hospital stay. **Methods:** It was a randomized controlled trial in which 158 cases were admitted through the Emergency Department of Pediatric Surgery of The Children's Hospital Lahore, from August 2018 to August 2019. These patients were divided into 2 groups (79 in each group), Group A (ultrasound-guided hydrostatic reduction) and group B (open reduction). Data were collected through a questionnaire, which was entered into the computer using SPSS version 24.0. **Results:** Among 79 patients treated in-group A, 54.4% were up to 12 months old, and 67.1% males, in this group the hospital stay for 74.7% was 1-2 days and 74.7% had a successful reduction. In group B; patients treated in group B, 77.2% were up to 12 months old, and 72.2% were males. The hospital stay for 59.5% of patients was 5-7 days, and 83.5% had a successful reduction of intussusceptions. The recurrence was only in group B (3.8%) after the reduction of intussusceptions. **Conclusion:** The study concluded that ultrasound-guided hydrostatic is effective in terms of successful reduction, recurrence and hospital stay and should be preferred among children due to its safety and effectiveness.

## INTRODUCTION

Intussusception was first described in 1692 [1]. It is acquired invagination of the intestine, one portion invaginates in the adjoining bowel. Its prevalence is about 31 to 38/1per 00,000 live births cases during 1st & 2nd year of the life respectively [2]. Males are three times commonly affected by intussusception than females. It has been classified, according to the area of involvement, for example, ileo-ileo-colic, ileo-colic, ileo-ileal, colo-colic, and jejuno-jejunal [3]. Most of intussusceptions (90%) are ileocolic and remaining 10% are of colo-colic or ileo-ileal type [4]. Intussusception clinical presentations could

differ and can comprise non-specific symptoms like crying episodes, vomiting, sluggishness and abdominal pain. Appearance of stool "currant jelly", delayed finding while indicator for the bowel ischemia, is seen among majority of cases. Ultrasonography is investigation of choice in current era for intussusception [5]. Nonsurgical and surgical technique has been utilized to manage the intussusception. Surgical management of intussusceptions involves open laparotomy along with manual reduction. The USGHR is also a popular treatment method to treat intussusceptions. This technique is much

simple, economical, efficient and quick for the management of intussusception [6]. The USGHR other advantages comprise patients less discomfort, less mortality and morbidity and less hospital stay when compared with surgical treatment [7]. Besides its benefits, open reduction is still preferred by majority of pediatric surgeons in our country. The main reasons are lack of surgical and radiological expertise and hesitancy to accept new modality. Furthermore, no authentic study has been performed till date in Pakistan. The objective of this study is to do the comparison of ultrasound guided hydrostatic reduction versus open reduction in intussusception in terms of successful reduction, recurrence and hospital stay [8].

## METHODS

It was a Randomized controlled trial conducted in one year from August 2018 to August 2019 at department of Pediatric Surgery with the collaboration of Radiology Department of Children Hospital Lahore. A total of 158 cases were taken and divided into 2 groups (79 in each group). The sample size is calculated using the World Health Organization sample size determination in health sciences software version 2.0. for randomized control trial studies parameters for estimating an odd ratio with specific relative precision of 30 % (0.30), with confidence interval of 95%, anticipated probability of exposure given diseases (P1) 0.46, anticipated probability of exposure given no disease (P2) 0.30 and anticipated odd ratio of 2.0 was opted using the following formula. A total sample size of 158 was calculated which includes 100 cases and 58 age-matched controls. The patients of age  $\leq 15$  years of either gender with intussusception presenting within 48 hours after the development of the symptoms were included. While patients with recurrent intussusception, non-idiopathic intussusception with lead point on (USG) and children with radiological evidence of Pneumoperitonium or with features of peritonitis were excluded. Children fulfilling inclusion criteria were taken in this study from emergency department of Pediatric surgery of Children Hospital Lahore. After taking informed consent from parents or attendants of the children a detailed history was taken along with their age, gender and address. Following the physical examination, biochemical tests, blood grouping and cross matching, ultrasound abdomen and abdominal X-ray in erect position were done for all cases. Ultrasound linear array transducer of 7.5 to 10MHz using ALOKA SSD5500 was used. After resuscitation and making diagnosis with the help of ultrasound patients were assigned a group by lottery method. In group A (ultrasound guided hydrostatic reduction group) after giving sedation, abdominal ultrasound was performed in the transverse and

longitudinal planes to establish a diagnosis of intussusception and localize the region of the abdomen where the lesion is situated which is recognized by the 'dough nut' and 'pseudo kidney' signs. An appropriate sized Foley's catheter was passed per rectum lubricated with 2% lignocaine and the balloon inflated (with 7-10ml of N/S) and secured in situ. The buttocks were be taped together to provide a seal. The saline was heated to 37 oC injected in upright position and kept at a height of 100cm above the bed level. 100 cm height gave approximately 73 mmHg of pressure. The hydrostatic pressure was monitored by a sphygmomanometer attached to the Foley's catheter by way of a T-connection device. 500-1000ml of N/S was used depending on the size of patient. Reduction was deemed to achieve when a free flow of fluid was seen within the bowel and the disappearance of the dough-nut or pseudo kidney sign, mass or it crosses the ileocecal junction and free flow water in few inches in distal ileum. Once reduction achieved the catheter was removed after deflating the balloon while the excess fluid was drained by lowering the saline bag below the level of bed and some fluid was also spontaneously excreted by patient. If the intussusception was not reduced after three minutes of sustained pressure, the saline pressure was lowered and child rested for three minutes. Three such attempts were made before considering the intussusception irreducible and going for open procedure. After the procedure the patient was shifted to Surgical Follow up/ Recovery under monitoring. All the ultrasounds were performed by the radiology department. For patients who were planned in group B, they were operated with conventional open technique. All cases were followed up for 4 weeks to see underlying complications such as recurrence of intussusception with the help of ultrasound. Beside that patients were followed on outdoor basis, physically examined and were also informed in detail at the time of discharge about symptoms of recurrence. All follow-up scans were done by radiologist. The data collected were entered and analyzed using SPSS version 22.0. For quantitative variables like age and duration of hospital stay were calculated. For qualitative variables like gender and complications were presented as frequency and percentages. Independent sample t-test/Mann Whitney U-test was applied to compare hospital stay in both groups. Chi-square test was applied to compare complications in both groups. P-value  $\leq 0.05$  was considered significant.

## RESULTS

A total of 260 cases presented in Emergency, after resuscitation and making diagnosis 102 cases patients were divided into two groups (Group A and B). The mean age of the patients was 29.11 + 41.48 months and 18.18 +



24.75 months in Group A and group B respectively. In both group male gender was dominant details are given in table 1.

Variables	Group A	Group B
Age	29.11 + 41.48	18.18 + 24.75
Gender		
Male	53 (67.1%)	57 (72.2%)
Female	26 (32.9%)	22 (27.8%)

**Table 1:** Frequency distribution of patients according to age and gender in both groups

The clinical findings; patients in group A, 76 (96.2%) had abdominal pain, in group B, 76 (96.2%) patients had abdominal pain, and other symptoms were includes; abdominal distension, loose motion, constipation, bloody stool, vomiting, jelly color stool, features of intestinal obstruction, bleeding PR and had palpable mass in both groups details are shown in table 2.

Clinical Findings	Group A		Group B	
	Yes	No	Yes	No
Abdominal pain	76 (96.2%)	3 (3.8%)	76 (96.2%)	3 (3.8%)
Abdominal distension	14 (17.7%)	65 (82.3%)	20 (25.3%)	59 (74.7%)
Loose motion	6 (7.6%)	73 (92.4%)	7 (8.9%)	72 (91.1%)
Constipation	11 (13.9%)	68 (86.1%)	14 (17.7%)	65 (82.3%)
Bloody stool	5 (6.3%)	74 (93.7%)	0 (0.0%)	79 (100.0%)
Vomiting	24 (30.4%)	55 (69.6%)	37 (46.8%)	42 (53.2%)
Jelly color stool	7 (8.9%)	72 (91.1%)	15 (19.0%)	64 (81.0%)
Intestinal obstruction	2 (2.5%)	77 (97.5%)	0 (0.0%)	79 (100.0%)
Bleeding PR	24 (30.4%)	55 (69.6%)	18 (22.8%)	61 (77.2%)
Palpable mass	0 (0.0%)	79 (100.0%)	3 (3.8%)	76 (96.2%)
Fever	0 (0.0%)	79 (100.0%)	3 (3.8%)	76 (96.2%)

**Table 2:** Frequency distribution of patients according to clinical findings

Among 79 patients treated in group A, 59 (74.7%) had successful reduction of intussusception, Likewise in group B, 66 (83.5%) had successful reduction of intussusception and p-value was (0.17) insignificant. In group A no recurrence after reduction of intussusception was observed, while among patients treated in group B, 3 (3.8%) had recurrence after reduction of intussusceptions. Out of 3 cases with recurrence, inflammatory fibroid polyp observed in 1 case and recurrence occur after 48 hours, no specific reason or any specific operative findings were observed in 3rd case that lead to recurrence. The result was found statistically insignificant. The mean hospital stay was 6.81 + 3.31 in group B, while its 2.52 + 1.76 days in group A. The results were found significant as the p-value was 0.00. Details are summarized in table 3.

Characteristics	Group A		Group B		p-value
	Frequency	Percentage	Frequency	Percentage	
Successful Reduction					
Yes	59	76.7%	66	83.5%	0.17
No	20	25.3%	13	16.5%	

Recurrence					
Yes	0	0.0	3	3.8	0.08
No	79	100.0	76	96.2	
Hospital Stay					
(Mean + SD)	2.52 + 1.76		6.81 + 3.31		0.00

**Table 3:** Frequency distribution of patients according to successful reduction and recurrence along with findings of mean hospital stay in both groups

## DISCUSSION

Study revealed that according to clinical findings, majority (96.2%) of the patients in group A, had abdominal pain, followed by vomiting (30.4%), bleeding PR (30.4%), abdominal distension (17.7%), constipation (13.9%), jelly color stool (8.9%), loose motion (7.6%), bloody stool (6.3%) and intestinal obstruction (2.5%). Likewise among patients treated in group B, majority (96.2%) had abdominal pain, followed by vomiting (46.8%), abdominal distension (25.3%) bleeding PR (22.8%), jelly color stool (19.0%), constipation (17.7%), loose motion (8.9%), palpable mass (3.8%) and fever (3.8%). While the findings of study undertaken by Talabi and fellows (2018) highlighted that among patients treated with USGHR, 100.0% had abdominal pain and vomiting, followed by palpable abdominal mass (95.6%), red currant stool (80.0%), dehydration (40.0%), fever (31.1%) and abdominal distension (13.3%). The results of a study showed that in open reduction group, 100.0% patients had abdominal pain and vomiting, followed by red currant jelly stool (60.0%), abdominal distension (40.0%), palpable abdominal mass (40.0%) and fever (28.0%) [5]. The results of different studies revealed that among patients who were treated with ultrasound guided hydrostatic reduction the mean age of the patients was 29.11 + 41.48 months. Likewise among patients who were treated with open reduction the mean age of the patients was 18.18 + 24.75 months. In both groups, most of the patients were up to 12 months old. As far as gender of the patients is concerned, indicated that in both groups males were in majority. Age range was same as mentioned in literature [9]. When hospital stay was compared among patients of both groups, study showed significant results (P = 0.00) and found that hospital stay was less among patients of group A. This corresponds to the findings of a study carried out by Ogundoyin and collaborators (2015) that also reported statistically significant results (P 0.00) and confirmed that hospital stay was less among patients treated with ultrasound guided hydrostatic reduction [10]. Another study conducted by Courtney and coworkers., 1992 also demonstrated that majority of the patients (70.0%) treated with open reduction were up to 12 months old and 30.0% were aged above 12 months [11]. It was found during study that among patients treated with ultrasound guided hydrostatic reduction; rate of successful reduction was 74.5% while it

was 83.5% among patients treated with open reduction [12]. The findings of our study are better than a study undertaken by reported that USGHR success rate was 60.0% [13]. But a study conducted by Kolm P (1992) exhibited better situation that USGHR success rate was 90.0% [14]. A recent study conducted by Meyer., 1992 highlighted the better efficacy of USGHR technique and found that success rate was 80.7% [15]. It is significant to mention that no recurrence occurred among patients treated with ultrasound guided hydrostatic reduction while recurrence was seen among 3.8% patients treated with open reduction. The findings of our study are better than the study conducted previously who stated that among children treated with USGHR, 2.2% had recurrent intussusception [16, 17]. Bratton and fellows., 2001 showed 7.5% recurrent intussusception among children experienced USGHR [18]. Another study reported that in USGHR group, recurrence occurred in 2.6% of children [19]. As far as open reduction is concerned, the findings of our study are comparable with a study done by Calder and coworkers., 2001 who reported 3.6% recurrence rate of intussusception [20]. Nayak and fellows., 2008 also confirmed in their study that USGHR success rate was 84.4% [21].

## CONCLUSIONS

Present study compared the ultrasound guided hydrostatic versus open reduction in intussusception. Study concluded that ultrasound guided hydrostatic is simple, effective, economical and quick method for managing intussusception. It was observed that USGHR is better in term or recurrence rate and hospital stay but regarding reduction, open method has higher success rate.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Gingivitis and Correlated Elements Amongst Patients Visiting Dental Care Facility in Rawalpindi

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## ARTICLE INFO

## Key Words:

Periodontitis, Gingivitis, Smoking, Oral Hygiene

## How to Cite:

Bashir, N., Rashid, F., Bilal, A., & Hassan, R. (2022). Gingivitis and Correlated Elements Amongst Patients Visiting Dental Care Facility in Rawalpindi: Gingivitis Amongst Patients Visiting Dental Care Facility in Rawalpindi. *Pakistan Journal of Health Sciences*, 3(06).<https://doi.org/10.54393/pjhs.v3i06.358>

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Received Date: 5th November, 2022

Acceptance Date: 21st November, 2022

Published Date: 30th November, 2022

## ABSTRACT

Gingivitis is one of the commonly known oral diseases globally. Gingival diseases are non-ordinary contamination that embraces an assorted clan of pathological units triggered by numerous etiologic aspects, if left untouched can crack into an added dangerous malady known as periodontitis. **Objectives:** To evaluate the incidence of gingivitis in patients coming to dental care facility i.e., DentoScope Institute of Advanced Dentistry, Rawalpindi and to learn the level of gingivitis and its related hazard aspects. **Methods:** This was a cross sectional research carried out to evaluate the level of gingivitis amongst the subjects appearing at DentoScope Institute of Advanced Dentistry Rawalpindi, Pakistan. The time of the research was eight months from January 2022 to August 2022. Non-probability purposive sampling was carried out for the collection of the subjects. **Results:** 400 patients were observed of which 172 (43%) were females and 228 (57%) were males. With a total of 141 patients out of 400, the age group from 30 to 39 appears to be the largest amongst all other varieties, followed by the 40 to 49 age group, which had a total of 131 patients. **Conclusions:** Inflamed gingiva, also commonly known as gingivitis is an avoidable normally happening disease in Pakistan that can be initiated by several various causative issues. Amongst diverse related risk aspects that cause gingivitis, chewing tobacco or tobacco smoking is the most regular one reported.

## INTRODUCTION

Gingivitis is one of the commonly known oral diseases globally [1]. Gingival diseases are non-ordinary contamination that embraces an assorted clan of pathological units triggered by numerous etiologic aspects, if left untouched can crack into an added dangerous malady known as periodontitis [2]. However, if gingivitis is left untreated and unregulated, it can result in a gap between the gums and the teeth, which can harm the bone and tissue supporting the teeth [3]. If the infection worsens, teeth may start loosening up in the gums and ultimately may need to get extracted [4]. Numerous insults add to gingivitis from use of certain medicines, smoking, uncontrolled diabetes, irritation by dental appliances, HIV and over hanging fillings/restorations [5]. Gingivitis is preventable and avoidable disease of periodontium. This is

only possible if appropriate brushing technique is adapted, twice a day every day; use of mouth washes, regular visits to the dentist, and proper cleaning of mouth after every meal [6]. In Pakistan, several scholars have established that periodontal problems never happen unaided; they are almost always linked with other associated elements [7-10]. The goal of the current study was to evaluate the incidence of gingivitis in patients coming to dental care facility i.e., DentoScope Institute of Advanced Dentistry, Rawalpindi Pakistan and to learn the level of gingivitis and its related hazard aspects.

## METHODS

This was a cross sectional study carried out to evaluate the level of gingivitis amongst the subjects visiting DentoScope Institute of Advanced Dentistry, Pakistan for

treatment. The length of the current study was eight months i.e., January 2022 to August 2022. Non-probability purposive sampling was carried out for the collection of the subjects. A Confidence Level of 95% was considered with precision of 5% and a predictable proportion of 50% was set. Conferring to the Daniel formula for sample size design 400 samples was calculated. Hence, 400 patients were cross-examined to estimate the severity of gingivitis. Patients aged among 18 to 50 years with all teeth except third molar. Patients with any identified handicapped, systemic diseases and illiterate patients were exempted from the current study. The locked concluded questionnaire was reformed from studying various research studies which consisted of two parts. First comprised the queries about the demographic features of the participants and the second encompassed the material on risk features that are related to gingivitis. To analyze the data SPSS version 25.0 was used. Frequency tables, occurrence distribution & percentages were used for tentative statistics like gender and Age-groups. Chi Square test was used to extent relations amongst the variables. P-value  $\leq 0.05$  was set as significant for the study. Vocal info was delivered to the all contributors regarding the persistence, risk and aids of the research. Inscribed knowledgeable agreement was attained from each contributor. All of the data provided by members were kept private and unidentified.

## RESULTS

A sum of 400 subjects were observed of which 172 (43%) were females and 228 (57%) were males. With a total of 141 patients out of 400, the age cluster from 30 to 39 appeared to be the largest amongst all other, followed by the 40 to 49 age cluster, which had a total of 131 patients. According to the findings, different types of gingivitis were seen in different patients. Among the patients, 88 (22%) had severe inflammation, 45 (11.3%) had mild inflammation, and 267 (66.7%) had moderate signs of gingivitis. (Table 1).

Variables	Frequency (%)
<b>Gender</b>	
Female	172 (43%)
Male	228 (57%)
Total	400 (100%)
<b>Age Groups</b>	
20-29	75 (18.75%)
30-39	141 (35.25%)
40-49	131 (32.75%)
50 and above	53 (13.25%)
Total	400 (100%)
<b>Gingival Index (GI)</b>	
Mild	45 (11.3%)
Moderate	267 (66.7%)
Severe	88 (22%)
Total	400 (100%)

**Table 1:** Demographic Variables

Table 2 shows that bulk of the subjects (n=318, 79.5%) didn't have any systemic issues alongside with gingivitis. Many of the participants (n=272, 68%) used tobacco or tobacco containing products. Many of subjects (n=332, 83%) brushed only once daily as equated to 17% who brushed twice daily. Most of the members (n=360, 90%) used toothpaste for brushing as equated to 40 (10%) who used maswak as the cleaning substantial. Majority of the patients (n=301, 75.25%) stated that their gums bleed while brushing however a good number of these subjects (n=277, 69.25%) not once go to see a doctor for any of their dental issues. Maximum of the subjects (n=260, 65%) had ache in their gums and consequently utmost of them (n=249, 62.25%) also had mastication issues though eating due to the ache. P value  $< 0.05$ , significant association was seen among the amount of gingivitis and tobacco mastication or tobacco comprising stuffs. It has been established that the subjects using tobacco in any custom are extremely pretentious by the gingivitis as related to those subjects who are not using tobacco in any custom which also stressed the point that the usage of tobacco can source solemn circumstances e.g., oral sub mucosal fibrosis plus even oral cancer. A P value  $< 0.001$ , highly significant association among sex of the patients and gingivitis was establish. Males (169, 74.1%) had more severe inflammation whereas maximum number of females (111, 64.5%) indicated a moderate form of inflammation.

Variables		Incidence (%)
"Do you have any systemic problem?"	No	318 (79.5%)
	Yes	82 (20.5%)
"Do you take any form of tobacco or tobacco containing products?"	Yes	272 (68%)
	No	128 (32%)
"How many times a day you clean (brush/ maswak) your teeth?"	Once	332 (83%)
	Twice	68 (17%)
	Thrice	00 (00%)
"What instrument you use for cleaning teeth?"	Datum	00
	Neem	00
	Tooth paste	360 (90%)
	Maswak	40 (10%)
"Does your gum bleed while brushing?"	Yes	301 (75.25%)
	No	99 (24.75%)
"Have you ever visited a dentist?"	Yes	123 (30.75%)
	No	277 (69.25%)
"Do you have chewing problems while eating due to pain in the gums?"	Yes	260 (65%)
	No	140 (35%)
"Do you have a problem of bad breath?"	Yes	249 (62.25%)
	No	151 (37.75%)

**Table 2:** Risk features related with gingivitis and features causing gingival tissue

## DISCUSSION

Gingivitis is an avoidable usually stirring disease in Pakistan

that can be instigated by numerous diverse risk aspects such as use of medicines, tobacco smoking, diabetes mellitus, orthodontic appliances, improper brushing etc. [11]. Amongst the various related risk features that grounds the gingivitis, chewing/smoking tobacco was the most regular one described. The tobacco chewing was allegedly similarly shared in both the genders [12, 13]. Gingivitis affects gum health bringing about trouble in chewing; stagnation, exasperation of the gum and bad odor that does not go away like that even after cleaning the teeth via brushing or mouth washes [14]. Though, gingivitis could be prohibited and is rescindable by means of the appropriate brushing procedure; two times regularly brushing along with consistent visit to the clinic of dentist, mouth washes usage and appropriate cleaning once meal is served [15]. The existing study displays that maximum number of the subjects were using brush only a time daily and the brushing procedure was also dubious henceforth the higher ratio of gingivitis between these patients. The current study ratifies this conclusion that the patients using pastes and mouthwashes had somewhat improved oral cleanliness as related to those who were using just brush or mouthwash, since usage of both these products condensed the amount of bacterial oral flora and hence prohibited a person from gingival tenderness. It's well known that braces specially fixed are responsible for certain pathological dissimilarities in the mouth of the patients [16]. These deviations are detected through initially in the management. These fixed appliances if not well kept hygienically helps by offering a capacity round the tooth where plaque can accrue on the surface around the tooth that can further leads and causes gingival tenderness [17, 18]. In the current study, few of the patients particularly patients who were female and were having orthodontic appliances, were establish to have poorer oral hygiene with plaque and bad odor. Therefore, orthodontic appliances in the management of patients can be measured as a risk aspect for gingivitis and periodontal swelling [19, 20]. Epidemiological surveys conducted on a steady routine may give essential data about changes in pattern and Prevalence of gingivitis, which can be supportive in design & providing treatment.

## CONCLUSIONS

Inflamed gingiva, also commonly known as gingivitis is an avoidable normally happening disease in Pakistan that can be initiated by several various causative issues. Amongst diverse related risk aspects that cause gingivitis, chewing tobacco or tobacco smoking is the most regular one reported. A highly significant association was found among gender of the patients and gingivitis as well as amongst the degree of gingivitis and tobacco. Males were having more severe gingival inflammation.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

Prevalence and Phenotypic Detection of Carbapenem and Multi Drug Resistant of *E. coli* in Urinary Tract Infection Patients in District SwatUzma Noor<sup>1</sup>, Muhammad Suliman<sup>1</sup>, Husna Shams<sup>2</sup>, Amir Sultan<sup>3\*</sup>, Shah Hassan Khan<sup>4</sup> and Shazia<sup>1</sup><sup>1</sup>Upper Swat College of Nursing Swat, Pakistan<sup>2</sup>Microbiology Department, Sarhad University Peshawar, Pakistan<sup>3</sup>Nursing Department, Saidu Group of Teaching Hospital Swat, Pakistan<sup>4</sup>Provincial TB Program, Khyber Pakhtunkhwa, Pakistan

## ARTICLE INFO

## Key Words:

*E. coli*, Urinary Tract Infections, Carbapenem, Multi Drug Resistance

## How to Cite:

Noor, U. ., Suliman, M. ., Shams, H. ., Sultan, A., Hassan Khan, S. ., & Shazia, . (2022). Prevalence and Phenotypic Detection of Carbapenem and Multi Drug Resistant of *E. Coli* in Urinary Tract Infection Patients in District Swat : Detection of Carbapenem and Multi Drug Resistant of *E. coli*. Pakistan Journal of Health Sciences, 3(06), 243-247.  
<https://doi.org/10.54393/pjhs.v3i06.367>

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## ABSTRACT

Among prevalent infectious diseases, the most frequently occurring infections are the Urinary Tract Infections (UTIs) which predominantly occur in the community as well as in the hospital settings and are one of the main cause of morbidity and mortality worldwide. **Objectives:** To determine the frequency of MBL *E. coli* species in urine samples, antibiotic susceptibility pattern and the prevalence of MDR for *E. coli*. **Methods:** There were 200 urine samples obtained from Anwar clinical laboratory Saidu Sharif, District Swat, Pakistan. Samples of urine were obtained and then cultivated in selective media i.e. Cysteine Lactose Electrolyte Deficient Agar (CLED) and MacConkey Agar Plates. In traditional morphological and biochemical studies, isolates were identified. **Results:** Total 58 (29.6%) positive isolates were recovered from male while 116 (70.3%) urine specimens were positive from female patients, A total isolated bacteria were MBL positive including 36 (31.3%) isolated *E. coli*, Furthermore, in the total isolated species were identified as MDR positive in which 80 (69.5%) were *E. coli*, The most potent antibiotics found against bacteria were the highest for Meropenem (78.2%), Imepenum (73.9%), and Amikacin (26.0%) Cefuroxime (21.7%), respectively and Cefaclor (19.1%) were most sensitive while antibiotic mostly resistant showed. **Conclusion:** This study concludes that, the most prominent bacterial isolate in the urine samples was *E. coli* 115 (69.6%), Carbapenem resistance is frequently observed isolates of *E. coli*, which indicate that MBL phenotype should be regularly determined in clinical settings to prevent emerging Carbapenem resistance.

## INTRODUCTION

Each year, approximately 150 million infections are caused by urinary tract pathogens throughout the world. Among nosocomial infections, UTI's are the most recurrent, with a prevalence of 35%. Most UTI's are caused by *E. coli*, which occurs commonly in less severe UTI's [1]. After respiratory infections, this is the most common condition. The kidneys, ureters, bladder, and urethra are collectively referred to as the urinary tract. *Escherichia coli* is the bacteria mostly involved in causing UTI's Almost 35% of healthy women are suffering from UTI symptoms, and about 5% of women are suffering from painful urination (dysuria) each year. In women, the frequency of UTI's is

greater than in men [2]. Carbapenemase production in *Enterobacteriaceae* is a dominant issue affecting human health throughout the world. Carbapenemases can degrade  $\beta$ -lactam antimicrobial agents as well as carbapenems [3]. Metallo  $\beta$  lactamases (MBL's) include a wide range of  $\beta$ -lactamases not merely resistant to cephalosporin but to carbapenems as well. In *Enterobacteriaceae*, the ESBL phenotype is mostly observed, such as in *Morganella* and *E. coli* [4]. Recently, this pathogen has been frequently isolated in hospital settings across the globe, and MDR is emerging. These strains pose a challenge for clinicians and microbiologists



because of their increased propensity to cause not only nosocomial infections but also community-acquired infections [5]. Recent research has shown that uropathogenicity is the main cause of UTI's in *E. coli*, although *K. pneumoniae* is also a common cause of UTI's. The phenotypic tests comprise the modified Hodge test (MHT) and the process to inactivate carbapenems. The MHT senses the development of Carbapenemase in Enterobacteriaceae isolates and is easy, cheap, and highly accessible in routine clinical microbiology settings according to the Clinical and Laboratory Standards Institute (CLSI) [6]. A variety of hospitals reported UTI's in admitted as well as non-admitted patients. Nosocomial UTI's are frequently reported with a prevalence of 25–50% among hospitals, leading to economic loss and affecting human health [7]. The carbapenems group of drugs is very effective in the treatment of bacterial infections and can also save lives in the event of an MDR infection, in particular health-related infections. The resistance to carbapenems is also a significant problem for the healthcare system, restricting the antibiotic choices available to treat these infections. Carbapenemase production is recorded globally at higher rates in gram-negative bacilli [8]. Production of antimicrobial resistance has been increasing rapidly in recent times, and the future public health problems this may cause need concerted interventions worldwide in many health sectors. As a result, there have been several deaths in Europe, and the European Centre for Disease Prevention and Control (ECDC) estimated that 25,000 people could die per year from antimicrobial resistance-related infections [9]. Carbapenems are considered to be one of the most effective medicines for the treatment of bacterial infections, and a major public health issue is the rise and spread of resistance to these antibiotics [10]. A study was conducted where a total of 200 gram-negative bacilli (GNB) samples were collected. Isolates that display intermediate or prone areas, i.e., 16 mm or 21 mm, on disc diffusion were included in the study. (MHT) examined these isolates afterwards. Of the 200 isolates, 138 (69 %) were positive for Carbapenemase development by Modified Hodge. Of the 138 positive MHT species, the frequency is *E. coli* [11]. The MHT senses the development of Carbapenemase in *Enterobacteriaceae* isolates and is easy, cheap, and highly accessible in routine clinical microbiology settings according to (CLSI) [6]. A study was conducted on patients suffering from UTIs. Among 1074 isolates, the most highly reported microorganism was *E. coli*, isolated in 559 cases and exhibiting 14.5% MDR. *K. pneumoniae* was present in 168 samples and showed the highest MDR rate of 54.2%, followed by *P. aeruginosa*, which was isolated in 97 samples with a 38.1% MDR [12]. The aim of the current research work

was prevalence and phenotypic detection of Carbapenem and multi drug resistant bacteria in UTI patients in District Swat. The study will identify the prevalence of MDR among isolated uropathogens i.e. *K. pneumoniae*, *Citrobacter* and *E. coli*.

## METHODS

A descriptive, cross-sectional study design was used in this study. The samples of urine were collected from Anwar clinical laboratory in Saidu Sharif, District Swat, Pakistan, and included males and females of different age groups. A total of 200 urine samples were collected randomly. The patients previously not administered with antibiotics were included in the study, while others were excluded from the study. The urine samples were collected in sterile bottles from patients expected to have UTI's and were cultured on Cystine-Lactose-Electrolyte-Deficient Agar (CLED) and MacConkey agar plates. The samples were then incubated at 37°C for 24 hours. Nutrient agar was used for sub-culturing of samples a standard Gram staining procedure was used for morphological identification of bacterial isolates [13]. To identify *E. coli* morphologically and biochemically, different identification tests were used. *E. coli* species appeared in the form of opaque yellow colonies on CLED agar plates [14]. Four different biochemical tests were performed for the identification of microorganisms, i.e., urea, citrate, Triple Sugar Iron (TSI), and Sulfur Indole Motility Media (SIM) [15]. The carbapenemase enzyme production in *E. coli* is identified by modified Hodge test MHT. 0.5 McFarland dilution of the test microorganism was inoculated in 5ml of distilled water and the inoculum turbidity was adjusted with 0.5 McFarland. Test microorganism was streaked on MHA plates and was allowed to dry for 3-5 minutes. A 10µg Imepenum or Meropenum antibiotic disc was placed in the center of agar plate and then subjected to incubation at 37°C for 24 hours [11]. To determine MDR in isolated bacteria, different antibiotic discs were inoculated on MHA to build a uniform bacterial lawn with the aid of a sterile swab. Using sterile forceps at similar distances, antibiotic discs were placed above the surface (not less than 22 mm). The plates were set at 37°C for 24 hours in the incubator. The resistance of bacteria to a specific antibiotic has been demonstrated by the inhibition zone around antibiotic discs. The inhibition zone was calculated in mm according to the guidelines of CLSI, 2019. The antibiotic sensitivity test was conducted through "Kirby Bauer disc diffusion" method to determine the susceptibility pattern as per the CLSI guidelines, 2019 according to the procedure followed by [16]. The discs were placed on the test organism and control strains as controls on different agar plates. The diameter of the test organism's inhibition zone was measured with a scale. The filter paper discs with a proven antibiotic concentration

were placed on Muller-Hinton Agar (MHA) plates after inoculating MHA with a pure colony of microorganism. Antibiotics placed on MHA inhibit bacterial growth in an area where drug concentration is sufficient to kill bacteria or prevent their spread. The inhibition zone of the test organism is calculated after the formation of a clear visible zone.

## RESULTS

A total of 200 urine samples were obtained from Anwar clinical laboratory in Saidu Sharif, District Swat Pakistan. Samples were collected from children and adults of both genders. Of the 200 samples, (82%) n = 165 were positive, while (18%) n = 35 were negative. In 165 positive samples, the number of female positive samples was higher (67%) compared to male positive (33%). In the urine samples, *E. coli* was recovered in the majority (69.6%), followed by *K. pneumoniae* (18.7%) and *Citrobacter* (11.5%) (table 1).

Variables	Characteristic	Frequency (n=200)
Total samples	Positive	165 (82%)
	Negative	35 (18%)
Gender	Male +	58 (33%)
	Female +	116 (67%)
Isolates	<i>E. coli</i>	115 (69.6%)
	<i>K. pneumoniae</i> ,	31 (18.7%)
	<i>Citrobacter</i>	19 (11.5%)

**Table 1:** Distribution of isolates and their gender wise frequency  
The total samples of *E. coli* n=115 were analyzed through Metallo  $\beta$  Lactamase which showed (31.3%) n=36 were positive while the majority of the MBL was negative (68.6%) (table 2).

Bacterial species	MBL positive	MBL negative	Total
<i>Escherichia coli</i>	36 (31.3%)	79 (68.6)	115

**Table 2:** Metallo  $\beta$  Lactamase (MBL) findings of samples  
*Imepenem* (73.9%) shows sensitivity, respectively, followed by *Amikacin* (69.5%), *ampicillin* (69.6%), and *co-trimaxazole*. The isolated bacterial species were tested for antibiotic sensitivity profiles. The most potent antibiotics found against bacteria were the highest for *Meropenem* (78.2%) and (60.8%) and *Nitrofurantoin* (60%), *Ampicillin + Salbactum* (57.3%), *Fusidic acid* (53.9%), *Penicillin* (51.3%) *Piperacillin + Tazobactam* (50.4%), *Linezolid* (51.3%), *Ceftazidime* (48.6%), *Amoxicillin + Clavulanic acid* (43.4%), *Cefepime* (39.1%), *Fosfomycin* and *Gentamicin* (30.4%). *Norfloxacin* and *Penicillin* (29.5%), *Cefadroxil* and *Amikacin* (26.0%), *Cefuroxime* (21.7%), and *Cefaclor* (19.1%) were the most sensitive, while antibiotics were mostly resistant as shown in table 3.

S. No	Antibiotics	<i>E. coli</i>	
		Sensitivity	Resistant
1.	Co-trimaxazole	70 (60.8%)	45 (39.2%)
2.	Fosfomycin	35 (30.5%)	80 (69.5%)
3.	Amoxicillin + Clavulanic acid	50 (43.5%)	65 (56.5%)
4.	Cefadroxil	30 (26%)	85 (74%)
5.	Cefaclor	22 (19.2%)	93 (80.8%)
6.	Cefexime	19 (16.5%)	96 (83.5%)
7.	Gentamicin	35 (30.5%)	80 (69.5%)
8.	Amikacin	80 (69.5%)	35 (30.5%)
9.	Ciprofloxacin	30 (26%)	85 (74%)
10.	Norfloxacin	34 (29.5%)	81 (70.5%)
11.	Nitrofurantoin	69 (60%)	46 (40%)
12.	Ceftazidime	56 (48%)	59 (52%)
13.	Ampicillin + Salbactum	66 (57%)	49 (43%)
14.	Cefepime	45 (39.2%)	70 (60.8%)
15.	Piperacillin + Tazobactam	58 (50.5%)	57 (49.5%)
16.	Imipenem	85 (73.9%)	30 (26.1%)
17.	Meropenem	90 (78.2%)	25 (21.7%)
18.	Ampicillin	79 (68.6%)	36 (31.3%)
19.	Cefuroxime	25 (21.7%)	90 (79.2%)
20.	Linezolid	59 (51.3%)	56 (48.6%)
21.	Penicillin	34 (29.5%)	81 (70.43%)
22.	Fusidic acid	62 (53.9%)	53 (46.0%)

**Table 3:** Susceptibility pattern of *E. coli*

A total of 115 isolates were MDR positive, of which 80 (69.5%) isolates were *E. coli*, while 35 (30.4%) were MDR negative (see table 4).

S No	Bacterial species	MDR positive	MDR negative	Total
	<i>Escherichia coli</i>	36 (31.3%)	79 (68.6)	115

**Table 4:** MDR results of samples

## DISCUSSION

UTIs are the most common infectious disease associated with the multiplication of microorganisms in the urinary tract. This research has been carried out to isolate and identify this research has been carried out to isolate and identify *E. coli* in the urine samples and also to find antibiotic susceptibility, MDR and MHT detected in the clinical isolates. UTIs are mostly (about 95%) caused by a single bacterial species, *E. coli*. Other bacteria that cause UTIs include *Proteus*, *Staphylococcus*, *Mycoplasma*, *Chlamydia*, *Klebsiella*, *Pseudomonas*, *Enterobacter Serratia*, and *Neisseria* spp. Each year, approximately 35% of healthy women are reported to have UTI symptoms, and approximately 5% of women experience painful urination (dysuria). The prevalence of UTI is higher in women compared to men [2]. In this study, we found a high incidence of *E. coli* (50.8%). Our results for *E. coli* are in agreement with the findings of a study that reported a high incidence of *E. coli* (50%). In this study, we found an elevated incidence of *Enterobacteriaceae* isolates [16]. In the finding of a study, 339 (77.1%) were *E. coli*, 56 (12.7%)

were *K. pneumoniae*, and 14 (3.2%) were strains of *P. mirabilis* and accounted for 11% (2.5%), while Sub Enterica had 9(2.0%), and *C. freundii. E. cloacae* Enterobacteriaceae resistance rates to cephalosporin are ranged from 47.5% for Cefepime to 63.2% for cefuroxime [17]. Cefoxitin was more active, with a resistance rate of 22.7% among nine cephalosporin's tested. This group of bacteria had a cumulative tolerance rate of 31.6% and 32.7%, respectively, to aminoglycosides, gentamicin, and tobramycin. The prevalence of MDRs among *Enterobacteriaceae* isolates was documented in patients having symptomatic treatment. Our findings showed that the rate of susceptibility of clinical bacterial isolates was the highest for Meropenem (78.2%) Imepenem (73.9%), respectively, followed by Amikacin (69.5%), Ampicillin (69.6%), Co-trimoxazole (60.8%), Nitrofurantoin (60%), Ampicillin + Salbactam (57.3%), Fusidic acid (53.9%), Penicillin (51.3%), Piperacillin + Tazobactam (50.4%), Linezolid (51.3%), Ceftazidime (48.6%) Amoxicillin + Clavulanic acid (43.4%) Cefepime (39.1%), Fosfomycin and Gentamicin (30.4%), Norfloxacin and Penicillin (29.5%), Cefadroxil and Amikacin (26.0%) Cefuroxime (21.7%), respectively and Cefaclor (19.1%) were the most sensitive, while antibiotics were mostly resistant, as shown in previous studies. The major MDR isolates were found to be *K. pneumonia* (95.6%) and *E. coli* (92.9%). Although the rate of MDR is different in different areas, similar groups of bacteria were found in Bahirdar, Ethiopia (*E. coli* at 94.6 percent and *K. pneumoniae* at 80%)[18], Nepal (*E. coli* at 74 percent and *K. pneumoniae* at 44 percent) and Dakar (*E. coli* and *K. pneumoniae* at 89 percent) [19]. The prevailing MDR was uropathogens. In addition, these bacteria are often difficult to treat because of their intrinsic resistance to several groups due to the predominant MDR uropathogens[20].

## CONCLUSIONS

The study results established the sensitivity and resistance of the identified organisms to the drugs. In the current study, the most prominent bacterial isolate in the urine samples was *E. coli* 115 (69.6%). Culture sensitivity revealed that the most effective antibiotics were Meropenem and Imepenem while resistance was observed against Cefixime, Ampicillin, Cefaclor, and Ceftriaxone. MHT was detected in any isolate, whereas *E. coli*, MHT production was tested to be positive.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Comparison of the Efficacy of Letrozole Versus Danazol in Pain Relief in Endometriosis

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## ARTICLE INFO

## Key Words:

Endometriosis, Danazol, Letrozole, Pelvic Pain.

## How to Cite:

Nawaz, S., Habib, S., Ayoub, S., Shams, G., Naeem, N., & Sultana, R. (2022). Comparison of The Efficacy of Letrozole Versus Danazol in Pain Relief in Endometriosis: Efficacy of Letrozole and Danazol in Endometriosis. *Pakistan Journal of Health Sciences*, 3(06). <https://doi.org/10.54393/pjhs.v3i06.345>

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Received Date: 11<sup>th</sup> November, 2022Acceptance Date: 26<sup>th</sup> November, 2022Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

Endometriosis is a chronic inflammatory disease defined as the presence of endometrium-like tissue outside the uterus which is responsive to the estrogen levels in blood circulation.

**Objective:** To compare the efficacy of letrozole versus danazol in pain relief in endometriosis.

**Methods:** This randomized controlled trial was conducted at the department of Obstetrics & Gynecology, Ayub Teaching Hospital, Abbottabad, Pakistan from January 2018 to December 2021. Patients diagnosed with endometriosis were enrolled and detailed medical history was taken. Patients were randomly divided into either Letrozole (n=120) or Danazol (n=120) group. Both treatment groups were evaluated after 3 months of treatment and efficacy was compared in terms of pain relief in patients of endometriosis. **Results:** In a total of 240 patients, the mean age was 28.30±4.76 years. The mean endometrial cyst size was 2.48±1.14 cm. At baseline, mean visual analog scale (VAS) score was recorded as 5.46±1.09 points in letrozole group and 5.28±1.01 points in danazol group (p=0.186). After three months of treatment, the mean VAS score was 2.94±1.96 points in letrozole group and 3.99±1.90 points in danazol group (p=0.002). Relief of symptoms was observed in 114 (47.5%) women and more patients reported relief of symptoms in letrozole group (65 patients) than the danazol group (49 patients) (p=0.039). **Conclusion:** Letrozole was more effective as compare to danazol in relief of pain in patients with endometriosis.

## INTRODUCTION

Endometriosis is considered to be a frequent gynecological issue and described as the existence of endometrial tissue present outside the uterus and cause various symptoms like infertility, chronic pelvic pain and cyclic menstrual cramps [1]. Literature reports the prevalence of endometriosis between 2-10% among females of general population but its proportions soars up to 50% among infertile females [2, 3]. Although the exact mechanisms by which the disease causes its occurrence, the pathophysiology and its progression are not yet clear. However, it has been well established now that endometriosis responds to estrogen exposure and its levels in blood. Its growth and regression have been found to be estrogen-dependent [4, 5]. Aromatase and 17 $\beta$ -hydroxysteroid dehydrogenase type 1 have been found to be

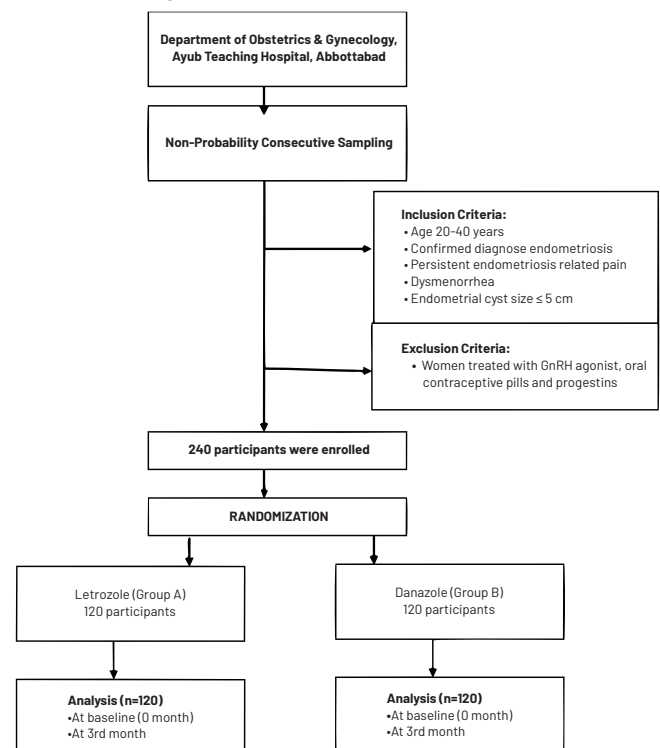
present in endometriotic implants. These enzymes are responsible for the conversion of androstenedione to estrone and estrone to estradiol, respectively [6]. The control of symptoms of endometriosis, particularly the pain relief is very crucial in improving the quality of life including education and work, sex, intimacy and emotional wellbeing [2, 3]. More than 50% women having chronic pelvic pain secondary to or associated with endometriosis do not respond to current medications that decrease the effect of estrogen on the body. Endometriosis has been known to have recurred even after conservative surgery and these recurrences are associated with pain which is resistant to repeated surgical attempts to find a cure [7]. The presence of endometriosis in menopause or its re-emergence despite treatment with estrogen production

inhibitors such as gonadotropin-releasing hormone (GnRH) agonists, there appears to be another source of estrogen production [8]. Studies shown that estrogen is produced in nearby tissues such as skin and adipose tissue [9]. Current treatment goal (e.g. combined oral contraceptives, Depo-Provera, oral progestins, danazol and GnRH agonists) is to induce hypo-estrogenism or to counteract estrogen action. The adverse effects of danazol and the reported increase in the initial risk of ovarian cancer actually made its use obsolete [10]. As discussed above, surgical treatments are usually not appropriate for all patients, and they also fail to provide symptomatic relief in majority of patients [6]. Letrozole is a 3rd generation non-steroidal aromatase inhibitor that produces selective aromatase inhibition. It causes a significant decrease in the body's total estrogen and has become a standard cancer care estrogen receptor positive [2, 11]. The purpose of this study was to compare the efficacy of Letrozole with that of Danazol with respect to provision of pain relief in women with diagnosed endometriosis and evaluate the efficacy of letrozole and danazol in terms of reducing symptoms of chronic endometriosis.

## METHODS

After getting ethical approval from institutional review board (IRB) of Ayub Teaching Hospital Abbottabad, this randomized controlled trial was conducted at the department of Obstetrics & Gynecology from January 2018 to December 2022. After informed consent, a total of 240 patients diagnosed with endometriosis were enrolled. Sample size is calculated from the WHO sample size by the following parameters; the efficacy of letrozole as 75% and the efficacy of danazol as 60%, level of significance 5% and power of test was 80% [8]. The non-probability consecutive sampling technique was used for patients' selection. All women between the age of 20–40 years who had been diagnosed as having endometriosis either radiographically or on laparoscopic examination and were having persistent endometriosis related pain including dysmenorrhea that persisted or recurred after one or more previous treatments or surgery and/or GnRH agonists and having endometrial cyst size less than 5cm were included in this study. Women who were treated successfully by other medical treatment options including GnRH agonists, oral contraceptive pills and progestins were excluded from the study. The investigator thoroughly gone through the case history, physical examination and routine investigations. Patients were randomly assigned to the letrozole (A) group and the danazol (B) group electronically. Random sequencing numbers generated electronically by biostatistician and distribution were sealed in light envelopes to ensure encryption. The data was collected on predesigned patient proforma which included 0–10cm

visual analogue scale (VAS) as subjective measure. In letrozole group patients were administered per oral route letrozole 2.5 mg/day whereas, patients in danazol group were administered per oral route danazol 600 mg/day. Patients were called for follow-up after three months of treatment with either drug and they were asked to record their responses on VAS scale. Patients' response on the VAS scale were recorded at baseline (0 month) and at the end of treatment (3rd month) as shown in figure 1. Data analysis was performed with version 21 of SPSS. Data validity was assessed by the Shapiro-Wilk test for general and similarity, based on which parametric or nonparametric test was used to determine within the group and for all group differences in the two groups. To determine the effectiveness of the two groups the chi square test was applied. The confounding variables such as age, VAS score and endometrial cyst size were controlled by stratification. An independent sample t-test of post stratification was used. The value of  $p \leq 0.05$  was considered significant.



**Figure 1:** Consort diagram

## RESULTS

In a total of 240 patients, the mean age of the patients was  $28.30 \pm 4.76$  years with minimum 20 years and maximum 36 years of age. The mean endometrial cyst size was  $2.48 \pm 1.14$  cm with minimum 1cm and maximum 4cm. Relief of symptoms was observed in 114/240 (47.5%) and treatment was found efficacious in 54.2% ( $n=65/120$ ) of patients in group A (Letrozole) and in 40.8% ( $n=49/120$ ) of patients in

group B (Danazol).

Efficacy of drug used	Groups		Total	p value*
	Letrozole (A)	Danazol (B)		
Yes	65 (54.2%)	49 (40.8%)	114 (47.5%)	0.039
No	55 (45.8%)	71 (59.2%)	126 (52.5%)	
Total	120	120	240	

**Table 1:** Efficacy of treatment according to the drug used in both groups, n=240. \*Chi square test

At baseline, mean VAS score was recorded as  $5.46 \pm 1.09$  points in letrozole group and  $5.28 \pm 1.01$  points in danazol group ( $p=0.186$ ). After three months of treatment, the mean VAS score was  $2.94 \pm 1.96$  points in letrozole group and  $3.99 \pm 1.90$  points in danazol group ( $p=0.002$ ). Mean VAS score recorded in both groups at baseline and at the end of treatment (3rd month), Table 2.

VAS score	Letrozole group	Danazol group	p value*
	Mean $\pm$ SD	Mean $\pm$ SD	
At baseline	$5.46 \pm 1.09$	$5.28 \pm 1.01$	0.186
At 3rd month	$2.94 \pm 1.96$	$3.99 \pm 1.90$	0.002

**Table 2:** VAS score for pain reported by patients before and after treatment in both groups, n=240. \*Independent sample t test

Patients with an endometrial cyst size 1cm or less were 64 (26.67%), cyst size between 1-2cm were 56 (23.33%), and with cyst size between 2-3 and 3-4 cm were 60 (25%) each. The association between drug's efficacy and the endometrial cyst size was measured, Table 3.

Efficacy of drug used	Endometrial Cyst size in cm				Total	p value*
	1	2	3	4		
Yes	32	27	27	28	114	0.953
No	32	29	33	32	126	
Total	64	56	60	60	240	

**Table 3:** Endometrial Cysts size in both groups, n=240. \*Chi square test

## DISCUSSION

This study enrolled 240 patients who were diagnosed with endometriosis. Patients' assessment of pelvic pain was recorded at the end of third month of treatment on VAS scale. Treatment was considered effective if the responses recorded on the VAS had a maximum score of 3. In the letrozole group, 54.2% patients reported a decrease in the symptoms of endometriosis i.e., chronic pelvic pain and cyclic menstrual pain. Whereas, 45.8% patients did not report any improvement in pain associated with endometriosis. In the danazol group 40.8% patients reported a symptomatic relief while the symptoms of endometriosis were not relieved in 59.2% patients. A p value of 0.039 was obtained which was significant. There was no significant association between endometrial cyst size and the efficacy of drugs in relieving the symptoms. Ferrero et al conducted a comprehensive research to identify studies that evaluated the efficacy of aromatase inhibitors. They noted that progestogens or contraceptive

reduce the severity of symptoms and improve quality of life. Letrozole was found to be more effective when administered in combination with another drug than alone. However, when administered along with the gonadotropin-releasing hormone analogue, it significantly reduced the recurrence of symptoms [12]. A randomized controlled trial by Rasul et al reported from Pakistan that letrozole was more effective than danazol in providing symptomatic relief to patients with confirmed endometriosis. They enrolled patients with confirmed endometriosis. They concluded that the most common points of chronic pelvic pain, dysmenorrhea and dyspareunia among letrozole group were less than danazol groups [13]. Earlier, similar results had been reported by Roghaei et al who studied the effects of letrozole on refractory endometriosis and chronic pelvic pain in premenopausal women [14]. They noted that aromatase inhibitors were beneficial in treating chronic pelvic pain due to refractory endometriosis and that these drugs had no negative effect on the fertility. This study also found that letrozole was superior to danazol in providing symptomatic relief to patients diagnosed with endometriosis, though no effort was made to determine its effect on the fertility of the patient. Also, no comparison was done between the side effects caused by danazol and letrozole. Almassinokiani et al treated women with either oral contraceptive pills or a combination of letrozole and OCP. With a baseline VAS score of at least 5, these women were treated for 4 months after which they were re-assessed. The researchers noted that there was a comparable effectiveness in both treatment modalities and that letrozole did not affect the outcomes [15]. These results are in contrast to other reports from the same region which showed that letrozole was both effective and superior to other drugs in treating pain associated with endometriosis [16]. A systematic review by Goenka et al concluded that aromatase inhibitors have a promising role in pain with endometriosis but because of shortage of evidence, this association is not strong enough [17]. Interestingly, a randomized controlled trial reported that letrozole was better as gonadotropin releasing hormone inhibitors in reducing the volume of endometriotic tissue and in controlling the symptoms [18]. Patients received oral letrozole (2.5 mg/day) or gonadotropin-releasing hormone agonist (goserelin, 3.6mg) for 12 weeks. Uterine volume and adenomyoma were determined at baseline and during treatment at 4, 8 and 12 weeks. At the end of the study, no significant differences were found. In this study, there was a significant difference in the symptomatic relief provided by both letrozole and danazol. The results of this study confirm earlier findings by many researchers, yet there are conflicting reports [19, 20]. However, as a first ever study of its kind in this region, the results of this study are

promising, thereby indicating a need for a large-scale trial to confirm these findings.

## CONCLUSIONS

Efficacy of letrozole was found better than danazol for treatment of endometriosis. Letrozole an aromatase inhibitor has shown promising results for providing symptomatic relief to patients with endometriosis.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Open versus Laparoscopic Appendicectomy in Pediatric Patients; A Comparative Study in a Single Center

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## ARTICLE INFO

## Key Words:

Appendectomy, Acute Appendicitis, Laparoscopy, Open Appendectomy, Pediatric

## How to Cite:

Rehman, H. U. ., Naeem, T. ., Bugti, Q. ., Shah, V.-E.-S. ., Fayaz, M. ., & Rashid, M. . (2022). Open Versus Laparoscopic Appendicectomy in Pediatric Patients; A Comparative Study in A Single Center: Open and Laparoscopic Appendicectomy in Pediatric Patients. *Pakistan Journal of Health Sciences*, 3(06). <https://doi.org/10.54393/pjhs.v3i06.371>

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## ABSTRACT

Appendicitis is the commonest surgical emergency in paediatric patients. Appendicectomy is still being performed by both open and laparoscopic methods. The first laparoscopic appendicectomy was performed in 1983. **Objective:** To compare the outcome of open appendectomies with laparoscopic appendectomies in pediatric patients was the objective of this study. **Methods:** Two hundred pediatric patients of both genders with acute appendicitis were enrolled from emergency department of Pediatric Surgery, Qazi Hussain Ahmad medical complex, Nowshera, from March 2020- December 2020. In this convenient study patients were dividing into two groups. Group A patients received open appendectomy and Group B received laparoscopic appendectomy. Outcome of both procedures were noted and compared between groups by chi square test. **Results:** Mean ages of patients were 10.11±2.67 and 10.01±2.31 years (p=0.796) in group A and B, respectively. There were 63.0% and 69.0% males in group A and B, respectively. Mean operative time, mean hospital stay and mean VAS were 26.19±8.14 vs. 36.79±11.41 min., 2.01±0.61 vs. 1.03±0.01 days and 3.67±1.41 and 6.07±2.01 (p=0.000) in group A and B, respectively. Complications were hemorrhage (0.0% vs. 0.0%; p=1.0), iatrogenic injury (0.0% vs. 0.0%; p=1.0) and Pelvic collection (3.0% vs. 0.05; p=1.0), SSI (6.0% vs. 0.0%; p=0.00) in group A and B, respectively. None of the pediatric patients after laparoscopic appendectomy required another exploration to deal with complications however, 3.0% patients needed exploration in open appendectomy. No mortality (0.0%) was observed in any group. **Conclusions:** laparoscopic appendectomies in pediatric patients is safe and feasible as compared to open appendectomy

## INTRODUCTION

Up until the invention of laparoscopic appendectomy (LA) in 1983, the open appendectomy (OA) method, which was first reported in the 19th century and is carried out through a right lower quadrant incision, has largely remained constant [1]. Appendicitis is the commonest surgical emergency in paediatric patients [2, 3]. In USA, one million children present with acute appendicitis, every year [4, 5]. Incidence of acute appendicitis is high in young age groups with a life time risk of 7%-9% [6, 7]. Several techniques to approach inflamed appendix are narrated in literature [8, 9]. Children are those patients that demand less invasive surgery as compared to adults because of parents

emotional and child's psychological factors [10, 11]. Appendicectomy is one of the most frequent emergency procedures in children, however the advantages of laparoscopic appendectomies (LA) over open appendectomies (OA) are not yet clear [12,13]. Particularly because of the potentially disruptive effects of illness on their lives, children represent a group of patients who would greatly benefit from reduced postoperative complications, earlier mobilization, and ultimately discharge from hospital [14]. The results of LA and OA in children have been extensively studied, but conclusions have been difficult to come to due to the small study size,

lack of many randomized trials, and potential heterogeneity in patient characteristics, surgical technique and severity of appendicitis between these studies [15]. Laparoscopic appendectomy, unlike other laparoscopic surgeries has not been found superior to open surgery for acute appendicitis [16]. Current study was conducted to confirm the possible benefits of the laparoscopic procedure. The purpose of this study is to compare the clinical outcome in terms of hospital stay, operating time, postoperative complications and analgesia requirement for pain between open and laparoscopic appendectomy. Researchers undertook this study to evaluate the results of open and laparoscopic appendectomies in paediatric patients in order to assess the efficacy of this limited access strategy.

## METHODS

Two hundred pediatric patients (newborn 12 years) of both gender with acute appendicitis were enrolled from emergency department of Pediatric Surgery, Qazi Hussain Ahmad Medical Complex, Nowshera from March 2019 - December 2020. Patients with appendicular mass on clinical examination were excluded from the study. In this convenient study patients were dividing into two groups (100 in each group). Group A: patients underwent open appendectomy. Group B: patients underwent multiport laparoscopic appendectomy. Demographic features and outcome of both procedures were noted and compared between groups by chi square test. p-value of less than equal to 0.05 was considered significant. The sample of the study was calculated through devising a pro-forma for the two procedures. The required data were collected and calculated for the two groups following statistical package for the social sciences (SPSS) technique version 21.0. Regarding the inclusion and exclusion criteria all the cases of paediatric age group were included in the study while those cases with perforated appendix having frank peritonitis were excluded from the study. We excluded all patients above 12 years of age from this study.

## RESULTS

The mean ages of patients were 10.11±2.67 years and 10.01±2.31 years (p=0.796) who underwent open and laparoscopic appendectomies, respectively. The majority of patients i.e. 51.0% and 63.0% were belonged to age group 7-9 years in open and laparoscopic appendectomies, respectively. We compared different variables between the two groups in terms of age and gender of the patients to evaluate the commonest age group which was 7-9 years old with a total number of patients 114 patients. Among these patients 51 patients were treated with open surgery and 63 patients underwent laparoscopic surgery. The second commonest age group was 10 - 12 years old patients with a

total number of 70 patients out of which 39 patients were managed as open procedure and a laparoscopic approach was carried out in 31 patients. The other age groups were divided into 4-6 years old patients with acute appendicitis with a total number of 13 patients which was 8 patients for open surgery and 5 cases for laparoscopic surgery. The 1-3 years old age group was least common where the diseased patients with acute appendicitis were treated with open procedure with 2 to 1 ratio for open versus laparoscopic surgery. (Table 1)

Variables		Open appendectomy (n%)	Laparoscopic appendectomy (n%)	p-value*
Age (years)	Mean±SD	10.11±2.67 years	10.01±2.31 years	0.796**
	Newborn	0 (0.0)	0 (0.0)	
	1-3	2 (2.0)	1 (1.0)	
	4-6	8 (8.0)	5 (5.0)	
	7-9	51 (51.0)	63 (63.0)	
	10-12	39 (39.0)	31 (31.0)	
Gender	Male	63 (63.0)	69 (69.0)	0.981**
	Female	37 (37.0)	31 (31.0)	

**Table 1:** Characteristics of patients and acute appendicitis

\*Chi square test; \*\*Not significant

Regarding the outcome of open and laparoscopic appendectomies in paediatric patients we selected some parameters and compared them between the two groups. We selected four parameters which were mean operative time, hospital stay, pain intensity measured on the basis of visual analogue scale (VAS) and post-operative complications. Some important complications which were considered for the study were hemorrhage, iatrogenic injury, pelvic collection, surgical site infections (SSI) and the need for exploration again. Characteristics of patients and acute appendicitis and Outcome of open and laparoscopic appendectomy in paediatric patients are shown in Table 1 & 2. No mortality was reported in any case among any group of open and laparoscopic appendectomy.

Parameters		Open appendectomy (n%)	Laparoscopic appendectomy (n%)	p-value*
Mean operative time		26.19±8.14 min.	36.79±11.41 min.	0.000***
Hospital stay		2.01±0.61 days	1.03±0.01 days	0.001***
Pain VAS		3.67±1.41	6.07±2.01	0.000***
Complications	Hemorrhage	0 (0.0)	0 (0.0)	0.0001***
	Iatrogenic injury	0 (0.0)	0 (0.0)	1.0**
	Pelvic collection	3 (3.0)	0 (0.0)	1.0**
	Surgical site infections (SSI)	6 (6.0)	0 (0.0)	0.00***
	Need for exploration	3 (3.0)	0 (0.0)	0.00***
	Mortality	0 (0.0)	0 (0.0)	1.0**

**Table 2:** Outcome of open and laparoscopic appendectomies in paediatric patients

\*Chi square test; \*\*Not significant, \*\*\*significant

## DISCUSSION

Laparoscopy appendectomy is well known among adult patients to deal with acute appendicitis but in children, it is not well established in emergency circumstances [17]. In the present study, we compared the short term outcome of this minimal access approach for acute appendicitis with open technique of appendectomy in children to determine the safe use of laparoscopic appendectomy. The majority of patients i.e. 51.0% and 63.0%, in our study was belonged to age group 7-9 years in open and laparoscopic appendectomies, respectively and the mean ages of patients were  $10.11 \pm 2.67$  years and  $10.01 \pm 2.31$  years ( $p=0.796$ ) who underwent open and laparoscopic appendectomies, respectively. However, in a retrospective study by Pogorelic Z et al, median age of patients was 13 years [18]. Similar to our study, in a Retrospective cohort study by Langer et al, mean age of patients was  $10.4 \pm 3.7$  years and  $12.8 \pm 3.2$  years in open and laparoscopic appendectomies, respectively [14]. The male predominance was observed in our study i.e. 63.0% and 69.0% ( $p=0.981$ ) in group A and B, respectively. Similarly, in a retrospective study by Pogorelic Z et al, majority of patients were male i.e. 64% and 58% in open and laparoscopic appendectomy groups, respectively [18]. In a Retrospective cohort study by Lee SL et al, majority of patients were male i.e. 63% and 57% in open and laparoscopic appendectomies, respectively [19]. Mean operative time of appendectomy in our study was  $26.19 \pm 8.14$  min. and  $36.79 \pm 11.41$  min. ( $p=0.000$ ) in group A and B, respectively. In a retrospective study by Pogorelic Z et al, median operative time were 45 min and 30min. in open and laparoscopic appendectomy groups, respectively [18]. Mean Hospital stay in our study after appendectomy was  $2.01 \pm 0.61$  days and  $1.03 \pm 0.01$  days ( $p=0.001$ ) in group A and B, respectively. In a retrospective study by Pogorelic Z et al, median hospital stay were 6 days and 3 days after open and laparoscopic appendectomies, respectively. Mean VAS after appendectomy in our study was  $3.67 \pm 1.41$  and  $6.07 \pm 2.01$  ( $p=0.000$ ) in group A and B, respectively. Complications of open and laparoscopic appendectomies in our study were hemorrhage (0.0% vs. 0.0%;  $p=1.0$ ), iatrogenic injury (0.0% vs. 0.0%;  $p=1.0$ ) and Pelvic collection (3.0% vs. 0.05;  $p=1.0$ ), SSI (6.0% vs. 0.0%;  $p=0.00$ ). In a retrospective study by Pogorelic Z et al, Complications after open and laparoscopic appendectomies were wound infection (3.9% vs. 1.0%;  $p < 0.05$ ), intrabdominal abscess (1.7% vs. 1.7%;  $p > 0.05$ ), dehiscence of appendiceal stump (0.2% vs. 0.3;  $p > 0.05$ ), ileus (0.4% vs. 0.0%;  $p > 0.05$ ) and postoperative wound bleeding (0.0% vs. 0.3%;  $p > 0.05$ ) [18]. In a meta-analysis by Aziz et al, authors observed that wound infection was significantly lower after laparoscopic appendectomy as

compared to open appendectomy (1.5% vs. 5%) however more intra-abdominal abscess formation and longer operative time were observed in laparoscopic appendectomy than open appendectomy [20]. None of the pediatric patients after laparoscopic appendectomy required another exploration to deal with complications in our study however, 3.0% patients needed exploration in open appendectomy. In a retrospective study by Pogorelic Z et al, reoperations were performed in 1.3% and 1.3% patients who underwent open and laparoscopic appendectomy groups, respectively. No mortality (0.0%) was observed in any group in our study [18]. This study was carried in single center on small sample size. Multicenter and larger sample sizes are required to make guidelines.

## CONCLUSIONS

Current results showed the advantages of the laparoscopic approach over open appendectomy including shorter hospital stay, decreased need for postoperative analgesia, early food tolerance and lower rate of wound infection. It is therefore recommended that laparoscopic appendectomies in pediatric patients is safe and feasible as compared to open appendectomy because of good short term outcome of laparoscopic approach in children.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Effectiveness of Preoperative Vaginal Cleansing with an Antiseptic Solution among Cesarean Patients

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## ARTICLE INFO

## Key Words:

Antiseptic solution (AS), Cesarean section (CS), Povidone iodine (PI)

## How to Cite:

Tabasum Abro, S. ., Sohail, F. ., Majid Sheikh, E., Kaleem, R. ., gul, Z., & Fazal, K. . (2022). Effectiveness of Preoperative Vaginal Cleansing with an Antiseptic Solution among Cesarean Patients: Effectiveness of Vaginal Cleansing among Cesarean Patients. *Pakistan Journal of Health Sciences*, 3(06). <https://doi.org/10.54393/pjhs.v3i06.378>

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## ABSTRACT

Cesarean section is thought to be one of most common surgical method for delivery of baby, perhaps most frequent procedure by obstetricians. The most important factor after Cesarean section to return to normal life functions and look after new born is Infectious morbidity.

**Objective:** To compare the Effectiveness of preoperative vaginal cleansing with an antiseptic solution among cesarean patients. **Methods:** This Comparative study was done in department of Obstetrics and Gynecology, Sheikh Zayed Hospital Chandka Medical College Larkana from 20 June 2019 and the last at 19 December 2019. we included 336 patients fulfilling the inclusion criteria. Informed consent was taken. The data were collected on prepared proforma in two groups as A group (intervention group) and B (control group) respectively. **Results:** Study includes 336 patients with mean age of 26.29±4.7 and 26.52±5.9 years, divided in two groups 168 in each group A and B respectively. Out of 336, 14(4.2%) developed endometritis, 8(2.4%) developed wound infection and 16(4.8%) developed fever. The composite morbidity was 11.3%; with 26.3% of group A and 73.6% of group B. **Conclusions:** This study showed that the use of 10% Povidone iodine was significant in reducing post op morbidity. Cleansing of vagina with an antiseptic solution is easy intervention before cesarean section.

## INTRODUCTION

In current era where different and improved techniques of surgery are evolved in field of surgery post operative infection still important factor to achieve surgical results. In field of obstetrics cesarian section is most commonly performed procedure and accounts for major mode of child birth worldwide, according to statics only in united states of America it accounts for more than 30% mode of birth, whereas in the UK, the operative vaginal delivery rate is stable at between 10 and 15% [1]. Post operative morbidity remained special concern for any obstetrician that includes postoperative fever as result of endometritis, or wound complications at surgical site results in disruption

of the abdominal incision and hematoma formation that needs antibiotics, readmission in hospital for longer period and wound care that causes finical burden and negligence of newborn baby [2]. In long run, chances to develop disabilities like fallopian tube blockage resulting in secondary infertility and chronic pelvic pain are increased. Moreover, it accounts about one tenth of maternal deaths globally [3]. Chances for developing infection is more in cesarean mode of delivery in comparison with vaginal route of delivery. In different studies rate of post operative morbidity varies from 7% up to 20% [4]. Meanwhile various strategies are in practice to reduce this burden of infection

as there is paucity and variable data with different techniques, we planned this study with use of use of 10% Povidone iodine in our population[5]. CS in the 2nd stage of labor is associated with increased morbidity to the mother. Most common reasons of CS are abnormal position of the fetus during birth, labor that fails to progress or does not progress normally and baby is too large to be delivered vaginally [6]. Other reason may include placental complications such as placenta previa, and premature detachment from the fetus is known as abruption. Certain maternal medical conditions (such as diabetes, high blood pressure, or human immunodeficiency virus [HIV] infection) and active herpes lesions in the mother's vagina or cervix can also be the reason of CS [7]. Some cesarean deliveries are planned and scheduled, while others may be done as a result of problems that occur during labor. The objective was to make local guidelines to improve the standard of care for patient's outcome and to make it cost-effective.

## METHODS

This Comparative study was done after the approval of ethical committee in department of Obstetrics and Gynecology, Sheikh Zayed Hospital Chandka Medical College Larkana from 20 June 2019 to 19 December 2019. We included 336 patients in two groups A and B each with 168 patients fulfilling the inclusion criteria using Non-Probability, Consecutive Sampling. All the full-term pregnant patients admitted in gynae and obs unit for elective cesarean with age of 20 to 40 years were included and gave informed consent. We excluded patients with known immune compromised state (i.e., chronic liver disorders, chronic kidney disease or obesity), bleeding placenta previa, history of Pre cesarean section infection, obstructed labor, or preeclampsia and those with history of allergic to antiseptic solutions. The data were collected on prepared proforma from the prepared list those having Vaginal preparation with povidone-iodine solution were recruited as the intervention group (group A) and others are recruited as control group (group B). Demographic along with duration of labor, indication of caesarian recorded, post op morbidity defined as oral temperature of 38°C or more after 24 hours of procedure, endometritis was defined as uterine tenderness and foul-smelling lochia requiring broad spectrum intravenous antibiotic administration and wound complications labeled if infection at surgical site (seroma, hematoma, and disruption of the abdominal incision) that requires antibiotics will be assessed and collected on Performa. Data were entered and analyzed into SPSS version 20.0. The qualitative data like DM, rupture of membrane, Postoperative fever, endometritis, wound infection Postpartum composite infectious morbidity was

presented as frequency and percentages. Quantitative data like age (in years), BMI, parity hemoglobin was presented as means and standard deviations. Effect modifiers were controlled and chi square test was applied to compare the effectiveness postoperatively in both groups with p-value < 0.05 remained significant.

## RESULTS

Among the total study subjects (n=336), 168 in each group, group A (intervention group) and group B (control) respectively. The patients in both groups showed no significant difference in demographic characteristics with a p value of >0.05. In group A and group B the minimum age was 21 years and maximum 40 years with mean age of the study subjects was 26.29±4.7 and 26.52±5.9 years respectively. Mean weight of the patients was 72±13.9 and 72±45.9 in group A and group B respectively and mean height of the patients was 1.65±0.09 and 1.65±0.09 in group A and group B respectively. In group A and group B the mean BMI was 27.87± 4.02 and 27.87± 4.02 respectively. Mean hemoglobin of the patients was 9±1.9 and 10±2.9 in group A and group B respectively and mean parity of the patients was 3.1±1.9 and 3.0±1.2 in group A and group B respectively while mean parity of the gestational age was 37.12±1.9 and 37.45±1.2 in group A and group B respectively and mean length of labor after admission in hours are 3.03±6.41 and 3.26 ± 5.98 of group A and B respectively. In order of frequency the main indication of CS include repeated CS 66(39.3%), narrow pelvis 57(33.9%) and malpresentation of baby 45(26.8%) in group A while in group B the main indication of CS include repeated CS 71(42.2%), narrow pelvis 55(32.7%) and malpresentation of baby 42(25%) as shown in Table 1.

Variable	Group A	Group B
Mean Age years	26.29±4.7	26.52±5.9
Mean weight in kg	72±13.9	72±45.9
Mean height in cm	162.5±14.6	165.3±12.6
BMI	27.87± 4.02	27.87± 4.02
Mean hemoglobin in gm	9±1.9	10±2.9
Mean parity	3.1±1.9	3.0±1.2
Mean gestational age in weeks	37.12±1.9	37.45±1.2
Mean length of labor after admission in hours	3.03 ± 6.41	3.26 ± 5.98
Repeated CS	66(39.3%)	71(42.2%)
Narrow pelvis	57(33.9%)	55(32.7%)
Malpresentation of baby	45(26.8%)	42(25%)

**Table 1:** Comparison of demographic variables

Out of 336, 14(4.2%) developed endometritis, 2(14.3%) in group A and 12(85.7%) in group B with significant (p value=0.006). Out of 336 patients 8(2.4%) developed wound infection, 2(25%) from group A and 6(75%) were from group B with insignificant (p value=0.15). Latter those were readmitted and managed on the lines of wound care

protocol. Among 336 patients 16(4.8%) developed fever, 6(37.5%) from group A and 10(62.5%) from group B with insignificant ( $p$  value=0.30). The composite morbidity was 11.3% with 26.3% of group A and 73.6% of group B. Out of 336, 83(24.7%) had ruptured membrane, 38(45%) in group A and 45(54%) in group B with insignificant ( $p$  value=0.37) as shown in Table 2.

Study Variables	Total	Group A (Intervention group)	Group B (Control group)	p-value
Postpartum endometritis	14 (4.2%)	2 (14.3%)	12 (85.7%)	0.006
Postoperative wound complication	8 (2.4%)	2 (25%)	6 (75%)	0.15
Postoperative febrile morbidity	16 (4.8%)	6 (37.5%)	10 (62.5%)	0.30
Composite morbidity	38 (11.3%)	10 (26.3%)	28 (73.6%)	0.002

**Table 2:** Comparison of Post caesarean infectious morbidities

## DISCUSSION

Use of prophylactic parenteral antibiotics and other antiseptic solutions for vaginal cleansing remained in practice previously to see the outcome in terms of post operative infectious morbidity. In some previous studies Povidone iodine and chlorhexidine used for vaginal scrub while some obstetricians used intravaginal metronidazole for decrease in post operative morbidity but results were variable. We studied intervention with 10% Povidone iodine as it is cheaper, safe and easy to apply before surgery. Significant decrease in infectious morbidities post procedure (26.3% vs 73.6%) in the intervention with 10% Povidone iodine group in comparison with control group was seen in our study. Specially this reduction more in women with active labor undergoing caesarean section. Overall, post-CS infectious morbidity were significantly reduced from 24.4% in the control group to 8.8% in the intervention group;  $p$  value <0.05 by Ahmed et al., [8]. These results were consistent with observation of Guzman et al., where (6.9 vs. 11.6%) reduction povidone-iodine vaginal preparation in comparison with patients who not received, also Osborne et al., shows significant reduction in the total number of bacteria in vagina by at least 98% with the preoperative vaginal cleansing with Povidone iodine [9, 10]. In our study post caesarean endometritis was (14.3% vs 85.7%) in group A vs B. Similar Results were observed in study by Pitt et al., which shows (17% vs 7%) after using intravaginal metronidazole and also study by Rouse et al., used Chlorhexidine vaginal irrigation for the prevention of peripartur infection shows decrease in post caesarean endometritis [11, 12]. While study by Starr et al., showed post caesarean endometritis occurred in 7.0% of subjects who received a preoperative vaginal preparation and 14.5% of controls ( $P < .05$ ) [13]. Another Study by Haas et al., also showed a statistically significant reduction in the

incidence of post caesarean endometritis [14]. Our results are not consistent with study done by Sowapat et al., who prepared vaginal povidone scrub along with normal saline scrub did not find statically significant result [15]. This may be due cleansing effect of normal saline on vaginal flora. Maternal anemia, prolonged rupture of membranes and longer duration of labor due to multiple failed trails with repeated vaginal examinations by mid wives also remained consistent with our findings as risk factors. Najmi et al., also shows similar factors for early cesarian and morbidity [16]. This study finding includes Composite morbidity 38(11.3%) where Postpartum endometritis 14(4.2%) observed (14.3% vs 85.7%) in group A vs group B was statically significant. Among 336 patients only 8(2.4%) developed wound infection 2 in group A and 6 in group B some patients required Resuturing and parenteral antibiotics while study by Memon et al., showed 4 subjects had wound infection, 1 in cleansing group and 3 in the control group this may be due to small sample size in their study [17]. In other study by Tita et al., incidence of post caesarean incisional wound infections decreased, similar observation is also done by Monif et al., in their study [18, 19]. We observed Postoperative febrile morbidity 16(4.8%), out of them 6 in group A and 10 in group B with statically insignificant  $p$  value the results are consistent with the study done by Reid et al., which demonstrate no significant difference in the rate of post CS febrile morbidity with the intervention, however associated risk factors have already been discussed and reported to have a role in development of fever [20].

## CONCLUSIONS

Significant reduction was seen in post operative composite morbidity after use of use of 10% Povidone iodine. Vaginal Cleansing is cheaper and easy to practice before caesarean section. In future more research is needed to investigate all those high-risk factors and safe manipulation to reduce post op morbidity.

## Conflicts of Interest

The authors declare no conflict of interest.

## Source of Funding

The authors received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Strength and Reliability of Fabricate Zirconia by Additive Manufacturing

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## ARTICLE INFO

## Key Words:

Additive Manufacturing, Fabricate, Zirconia, Clinical practice, Strength

## How to Cite:

Khan, H. ., Amer Khan, M. ., Fahad, S. ., Tariq, A. ., Shawana, ., &amp; Ayub, Z. . (2022). Strength and Reliability of Fabricate Zirconia by Additive Manufacturing: Strength and Reliability of Fabricate Zirconia by Additive Manufacturing. Pakistan Journal of Health Sciences, 3(06).

<https://doi.org/10.54393/pjhs.v3i06.374>

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Received Date: 1st November, 2022

Acceptance Date: 25th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

Zirconia's distinctive intrinsic qualities have drawn the interest of the dentistry community in medical settings. The technology of additive manufacturing (AM), which produces very little waste, has been utilized to create complex and highly accurate materials. Despite AM has a number of potential benefits for efficiently producing functional, complicated shape zirconia components, there is still a paucity of industrial importance in implementations. **Objective:** To evaluate the strength and reliability of zirconia manufactured using the AM technology. **Methods:** A 3D printer was used to create zirconia bars in both horizontal and vertical orientations. The samples' geometrical correctness, density, layer thickness, and ductility were all measured using short bars. In tests for tensile properties, long bars were utilized. Using a caliper, the lengths of three short bars were measured, and the average values were calculated. They were contrasted with the theoretical parameters using a one-sample t-test. **Results:** It was discovered that varied construction orientations affect dimensional correctness, translucency, and dynamic qualities. Vertical-printed zirconia is denser and translucent than horizontally-printed zirconia. **Conclusions:** Nonetheless, zirconia that has been printed horizontally has remarkable precision and mechanical qualities. Stress and poor adhesion between the layers of materials should be fixed.

## INTRODUCTION

The dentistry community has been interested in zirconia ceramics due to its special qualities as an endodontically treated teeth materials and the rising patient desire for attractive, metal-free restorations [1]. Due to their exceptional mechanical characteristics, biocompatibility, high stability, and visual qualities, zirconia restorations are being utilized extensively in dentistry [2, 3]. Additionally, monolithic zirconia restorations becoming increasingly common in hospitals because to greater translucency and improvements in coloring techniques. Zirconia restorations provide additional benefits because of its mechanical characteristics [4], such as requiring less tooth preparation and removing the possibility of veneer

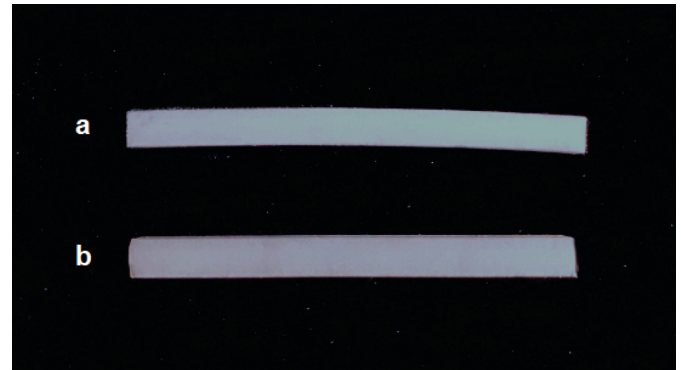
chipping for porcelain fused to zirconia restorations [5]. The term "net shaping forming" is frequently used to describe additive manufacturing, creating the idea that it will automatically generate items with "precisely the same" structure as the suggested conceptual layout. This is false with in majority of instances, especially when drying, debinding, and sintering are involved both before and after printing, such as is the situation with the present ceramics stereolithography process used to produce zirconia dental prosthesis [6]. Additive manufacturing (AM) offers various benefits and has established itself as a legitimate method of producing metals and polymers for use in dentistry [7]. Three-dimensional (3D) printing, also known as AM, which

is different from subtractive manufacturing in that it produces less waste, has been applied to create complex and highly precise materials [8]. Zirconia is one of the dental ceramics that is growing in popularity and application in dentistry because of its exceptional qualities [1, 2, 9]. It provides the opportunity to construct the structure and morphology of ceramic components without geometrical restrictions in a material-saving way since it is the only method for ceramic AM that is now commercially available [10]. Thus, it is advantageous to use AM techniques to considerably lower production waste and associated manufacturing costs [11]. Although AM has a number of potential benefits for efficiently producing functional, complicated shape zirconia components, there is still a paucity of industrial interest in actual applications. The purpose of this study was to evaluate the strength and reliability of fabricate zirconia manufactured using the AM principle.

## METHODS

Zirconia powder (Guangdong Orient Zirconic Ind. Sci. Tech. Co., China) and alumina powder (AztroGrit, USA) were combined in a 4:1 weight (wt) ratio. After that, ultrasonography was used to dilute the combination in ethanol. Afterwards, zirconia balls were used to ball-mill the blending in a planetary ball mill for six hours. After that, the mixture was dried for 12 hours in a 60 °C oven. Lastly, a 100-mesh screen was used to sift the dry powder. Four ingredients made up the blended solution that was utilized to make the enameled suspension: acrylamide, N, N' methylenebisacrylamide, glycerin, and deionized water. With a volume concentration of 30 vol%, the powder was then mixed to the mixture. Polyvinyl pyrrolidone K-15 was chosen as 1.2 wt% of the powder, and it was utilized as the dispersion to create the ceramic suspension. After that, zirconia balls were used to ball-mill the ceramic suspension for 12 hours. A vacuum mixer was then used to de-gas the suspension for 30 minutes. Under ultrasound, 2-hydroxy-2-methyl-1-phenyl-1-acetone was added to the ceramic suspension as an initiator in order to create a UV-curable ceramic suspension. The mass fraction of the photo initiator used in this investigation was set to 1 weight percent of the premixed solution. The Magics programme was used to produce the structural framework and slice the sections after the UG application was used to make the 3D model. The stereolithographic machine was then equipped with the final data, which had an x-y resolution, laser beam diameter, and layer thickness of 0.1 mm, 0.06 mm, and 0.07 mm. two distinct patterns of zirconia tiny bars (22 mm long) and long bars (36 mm long) i.e., vertically (V) and horizontally (H) was obtained by stereolithography using the ceramic suspension mentioned above (Figure 1). Both were 3mm

thick and 4mm wide. The short bars were printed (V), lying on three 4 mm<sup>2</sup> faces and for (H), the long and short bars lying on four 36 mm<sup>2</sup> faces and four 22 mm<sup>2</sup> faces respectively. The specimen dimensions' correctness, densities, layer thickness, and flexural strength were all measured using short bars. In tests for toughness, long bars were employed. They went through a binder burning procedure to produce dense parts after being ultrasonically cleaned with ethanol.



**Figure 1:** Long bars of V and H-group samples: a) shows a V-sample bar and b) shows an H-sample bar

One-way ANOVA was utilized to perform the study, and post hoc was employed to compare the groups for group H. The As-V and Polished-V-samples were compared using independent-samples t-tests. The sets for group H were compared using LSD post hoc, and one-way ANOVA was utilized to conduct the study. The As-V and Polished-V-samples were compared using independent-samples t-tests. The obtained products were sent to the Scanning Electron Microscopy Lab. at Centre for Nanotechnology and Advanced Materials Research, UET, Lahore is fully operational and scanning electron microscopy was used to investigate the fracture surfaces of the short bars following 3-point bend tests. The structural dependability of the AM zirconia fabricate was characterized with Weibull-modulus and Weibull-characteristic strength. Utilizing the methodology covered by Xiang et al., the fracture toughness was evaluated and the comparison was analyzed through LSD post hoc test and one-way ANOVA [11]. The data were normal and the variance was homogeneous. Statistical software (SPSS Statistics for Windows, version 26.0) was used to conduct all statistical analyses.

## RESULTS

To explore the stress concentration, that might cause the materials' distortion and loss of accuracy, volumetric shrinking was examined. Only the width of the group H-samples deviates noticeably from the expected dimensions, whilst the length of the group V-samples shows the most disparity (Table 1). The assembling altitude

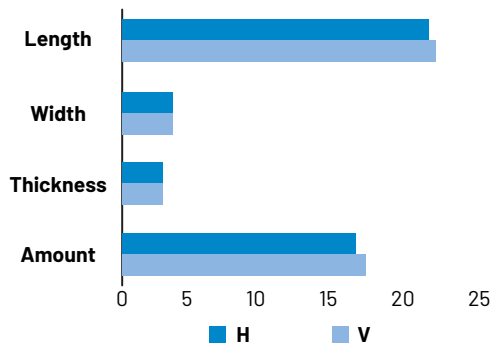
of the Z-axis layers represented by these two measurements. This specifies that a minor stack height is associated with precise dimension.

Group	Amount	Thick ± SD	Wide ± SD	Lengthy ± SD
V	17	2.94 (±0.02)*	3.97 (±0.09)*	22.24 (±0.10)*
H	16	2.95 (±0.04)*	3.97 (±0.05)*	21.96 (±0.04)*

\*P= 0.05 displays statistically relevant variations from the theoretical dimensions

**Table 1:** Dimensional mean and standard deviations (SDs) in millimeters

With the exception of the thickness of H-samples and length of the V-samples, which are spread fairly uniformly in the bar graphs shown in Figure 2 in which the majority of data is lower in comparison with theoretical value (almost all points are above the theoretical values). This demonstrates that more shrinkage than anticipated happens in the XY direction during the sintering process. The wide fluctuations in size demonstrate the unreliability of the findings for huge diameters. The sole mean value that exceeds the predicted value is the length of V, demonstrating that the shrinkage in the Z axis direction is less severe than expected. Low shrinkage is thought to be a factor in potential deformation and the development of flaws between subsequent layers. When the printing dimensions are huge, this tendency is amplified (22 mm).



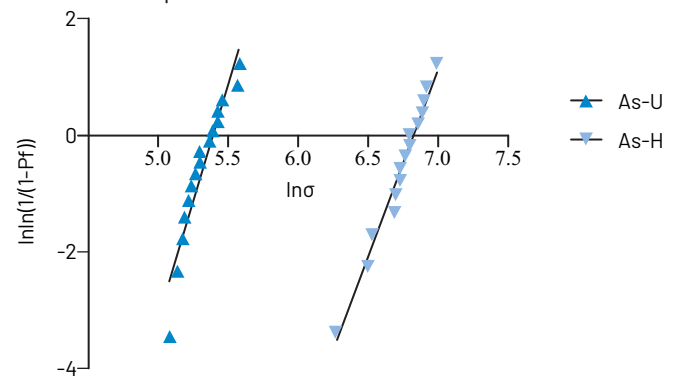
**Figure 2:** Measurements of the samples bars

The width of H is equal to the theoretical value thanks to a balance struck between the excessive shrinking and layer-by-layer delamination. This suggests that printing accuracy may not match clinical standards, particularly when the stacking height is composed of various thicknesses. Yet, these findings offer a benchmark for raising printing precision. Table 2 shows the initial H-group samples' flexural strength. The results clearly show that the Polished-H-samples have a higher flexural strength. Although stereolithography (SLA) is a near-net shaped process, strengths of components along with surface morphologies in as-sintered SLA ceramic are critical for calculating the dependability of these materials when used in dental restorations.

Prime Groups	Groups	Amount	MPa	Weibull moduli	Weibull characteristics
H	As-H	8	895.43 (±174.96)	6.50	920.22
	Polished-H	6	1095.94 (±200.98)		
V	As-V	17	205.73 (±32.00)	7.99	219.59
	Polished-V	4	226.45 (±46.10)		

**Table 2:** Characteristics of study samples

The flexural strength between the Polished-V and As-V samples i.e., (226.44 45.10 MPa) and (205.73 32.00 MPa) almost resemble each other. Despite the samples in the V-group having denser samples than those in H-group, an opposite tendency in flexural strength discovered. The samples that were printed vertically had parallel layers to the force applied, which is one explanation for this. This shows that the binding inside a single layer is stronger than the bonding between the layers. The samples manufactured vertically before and after polishing had identical flexural strengths. This behavior further confirms that there is insufficient adhesion between neighboring layers and that the effect of surface characteristics on flexural strength is not readily apparent. Layers are securely sintered into a complete body as evidenced by structural characteristics that have a minor ripple-like appearance. It needs to be recognized that imperfections including pores, agglomerations, and surface faults are unavoidable. These imperfections raise the possibility of a partial loss of AM zirconia's strength. Because of this, zirconia requires polishing, refining, and tinting in order to increase both its flexural strength and dependability as well as its visual and aesthetic qualities. The porosity in HC, the agglomerations, and the surface faults in V are representative flaws of AM zirconia, respectively. Any kind of sample might have one of these three categories of defects. The size of the data dispersion increases with decreasing Weibull modulus. In contrast to As-V, which has values of 219.6 MPa and 8, As-H has a greater Weibull characteristic strength and modulus of 920.22 MPa and 6.50 (Figure 3). This strength typically fits better when defining the strength of ceramic. The data of As-H appear to be more dispersed due to the lower Weibull modulus.



**Figure 3:** The As-H and As-V-group Weibull plots

The indentation method is widely used to evaluate toughness since it is rapid and simple. In the same test circumstances, this approach may be used to study the difference in fracture toughness of other substances, although the computed results do not truly represent zirconia's fracture resistance. According to ISO 23146, the SEVNB technique is advised for use for testing ceramic durability. The SEVNB technique is not appropriate for zirconia because it is challenging to generate a precise notch-tip radius in yttria tetragonal polycrystalline zirconia; thus, the samples used in this investigation were precisely cut into a V shape. The  $K_{Ic}$  value for the H, V, and C groups, which are 12.63 (1.38), 9.29 (1.0), and 14.72 (0.97) MPa $\sqrt{m}$ , differ noticeably from one another. The H-group can inhibit fracture propagation better than the V-group, as evidenced by the fact that its  $K_{Ic}$  values are substantially higher.

## DISCUSSION

By adjusting the production parameters, AM has been demonstrated to produce both completely sintered (solid) and partially sintered (more porous) objects. In order to simulate the mechanical characteristics of dentin and enamel and make it possible to create reinforced composite dental restorations, adding pores can alter the material's mechanical properties. Li et al., evaluated the internal and marginal adaptation of zirconia ceramic dental crowns along with the mechanical and physical characteristics of SLA additively generated zirconia crowns [10]. Flexural strengths of 812-128 MPa and a Weibull modulus of 7.44 made the SLA-manufactured zirconia crowns in this experiment strong enough to be used to construct dental crowns. Similar to this, Li et al., investigated and contrasted the efficacy of milled and SLA produced zirconia crowns with chamfer, rounded shoulder, and knife-edge finishing lines [12]. Utilizing 3D deviation evaluation, fabrication reliability was measured, and margin quality was evaluated using optics. Three digital abutment models with knife-edge finishing lines, rounded shoulders, and chamfers of 0.5 mm depth were created. Numerous threshold values could be found in literature for the roughness of surface which obstructs bacterial adherence [13-15]. Because of this, the  $R_a$  values of three-varieties of AM zirconia, together with H-coatings with or without manual flaws and surface of V, are still too high even when compared to the roughness value that is considered to be the most acceptable ( $R_a$  0.59  $\mu m$ ) (the minimum  $R_a$  is 0.70  $\mu m$ ). As a result, if these fabrics were to be utilized in dental restoration, the chance of secondary caries and periodontium inflammation would simultaneously increase. The opposing enamel is also worn down by a rough surface [15, 16]. To prevent the growth of microorganisms and antagonist wear, it is crucial that the

AM zirconia be polished. In the current study, there was no statistically significant difference between the As-H sample and the AM zirconia flexural strength, however both H-samples' strengths were decreases in comparison to the Polished-H sample. The H-group has considerably higher  $K_{Ic}$  values for fracture toughness than the V-group, representing that the H-group is enhanced and able to prevent crack propagation. The V-notch and force line are parallel to the layers in the V-group of samples but perpendicular to the layers in the H-group of samples, which may be why specimens with different orientations exhibit varying flexural strengths. Similar findings were also discovered by Xiang et al., [11]. Khanlar et al., analyzed the many AM techniques that may be used to create zirconia, including SLA, direct light processing, direct inkjet printing, and lithography-based (LCM) processes [2]. Only in the SLA among various AM processes was create zirconia found to be strong and reliable. These findings concur with the present research's findings of Ferrage et al., and Lüchtenborg et al., as well [17, 18]. The early lab investigations demonstrate several AM processing methods for zirconia for a variety of clinical uses, mostly in implant and restorative dentistry [19, 20]. Although each method has significant benefits, AM of zirconia for dental applications seems to most frequently use vat polymerization [21]. Although in-vitro investigations indicate that this new technique has similar mechanical qualities and precision to milling and its potential is highly promising, more advancements are required in a number of areas, including printer improvement, material research, and optimizing the printing settings.

## CONCLUSIONS

It was discovered that varied construction orientation affects dimensional correctness, translucency, and mechanical qualities. Vertically printed zirconia is denser and translucent than horizontally printed zirconia. Furthermore, zirconia that has been printed horizontally has remarkable precision and mechanical qualities. Tension and a lack of strong adhesion between the materials' successive layers are the main issues that need to be fixed. AM zirconia having considerable promise for use in dental applications and can be employed in single-unit dental prostheses, but more research is required to demonstrate their dependability under conditions that more closely resemble real-world clinical settings.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Frequency of Port Site Infection after Laparoscopic Cholecystectomy

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## ARTICLE INFO

**Key Words:**

Port Infection Site, Cholangitis, Gallbladder Disease, Gall Stones, Laparoscopic Cholecystectomy

**How to Cite:**
 Bilawal Khan, M. ., Khan, A. ., Ahmad Khan, Z. ., Khan, K. ., Waqas Khan, M. ., & Rehman, K. . (2022). Frequency of Port Site Infection After Laparoscopic Cholecystectomy: Port Site Infection and Laparoscopic Cholecystectomy. *Pakistan Journal of Health Sciences*, 3(06).

<https://doi.org/10.54393/pjhs.v3i06.375>
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Received Date: 2<sup>nd</sup> November, 2022Acceptance Date: 25<sup>th</sup> November, 2022Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

Cholangitis is an inflammation of the biliary tree due to Gallstones. The port region is susceptible to postoperative infections when a patient has excessive wounding and a microorganisms isolated from spontaneously procured tissue or fluid inside the upper cut.

**Objectives:** To analyze the frequency of port site infection (PSI) and to assess variables influencing PSI following laparoscopic cholecystectomies. **Methods:** This research was carried during 2022 in two hospitals in Peshawar(Pakistan). Only 55 of the 907 patients who had PSI after going through LC surgeries were included and were kept under observations for six months. Data were collected by questionnaire, imported into the SPSS for statistical analysis. Descriptive statistics and Chi-square test were used for association between variables.

**Results:** 34 patients out of 55 had CC, whereas 21 patients underwent surgery following an AC and became infected. Following LC, PSI frequency were lower than after open cholecystectomy. Majority of patients were women. Only five patients, based on the PSI, got an infection at the lateral ports, whereas 11 patients and 39 patients respectively, developed infections at the umbilical and epigastric ports. PSI came from majority of the female patients showing a significant association in frequency of PSI in relation to gender. **Conclusion:** Females tend to have high PSI rates and frequent epigastric port PSIs.

## INTRODUCTION

The gallbladder is located on the visceral inferior side of liver [1]. The commonest typical biliary pathology is thought to be gallstones. Gallstones are thought to afflict 10-15% of people in developed civilizations [2]. Among the most frequently performed surgeries in the US, cholecystectomies are done over nearly 700,000 patients annually [3]. Cholelithiasis is now prevalent at rates of 3-4% in Asian populations and 10-15% in western nations [4]. Gallstones are discovered in 8% and 20% of patients in Pakistan who are older than 40 and 60 years old, accordingly [5]. Gallstones are hard, stone-like fragments

of bile waste. When scanning is done for other signs, more than 80% of gallstone patients are not aware that the gallbladder disease was also shown to be present [6]. Regarding gastrointestinal and liver illnesses, one of most frequent clinical indication in the United States is gallstone disease (GSD) [7]. Cholelithiasis is prevalent in 3-11% of the Chinese population, 7.1% in India, and 5% in Taiwan [8-10]. Although there is currently a lack of information in Pakistan, a prior study indicated that the surgical frequency in Pakistan's southern Sindh region was 9.03 percent [11]. In 1986, Eric Mühe conducted the first



laparoscopic cholecystectomy (LC), which quickly rose to the status of the "Gold Standard" for the selective management of chronic gallstone disease [12, 13]. Multiple surgical treatments frequently lead to problems. Infections at the surgery area is among these issues (SSI). As a diversity of parasites may survive inside the body and get contaminated as a consequence of surgical intervention, the infection may be internal or exterior. In certain situations, a patient's bacterial pathogens may be invasive and result in infection. On a single laparoscopic procedure, this can happen during both open and partial surgery [14]. LC coupled with SSIs is extra open than cholecystectomy [15]. Even though port core infection is common after cholecystectomy, they are becoming more common and have a significant influence on the overall results of the procedure, including delayed return to work, higher expenditures, and unfavorable aesthetic adverse effects. The port region is susceptible to three different forms of postoperative infections [16, 17]. The patient has discharge from excessive cutting and microbes isolated from spontaneously procured tissue or fluid inside the upper cut. The first surgical infection happens within one month of surgery, affects only the skin and subcutaneous tissue, affects the patient's skin and subcutaneous tissue. The second form, a severe surgery infection, affects deep tissue that attaches the fascia and deep muscles to the wound and may appear 30 days after surgery. The patient has at least two of the following conditions: abscess, reduction of deep incision, and purulent discharge from deep incision. The third form of surgical site infection (SSI) affects any organ or place other than the incision that was made or utilized during surgery [18, 19]. Therefore, the current research was designed to analyze the frequency of port site infection (PSI) and to evaluate factors that influence PSI after laparoscopic cholecystectomies.

## METHODS

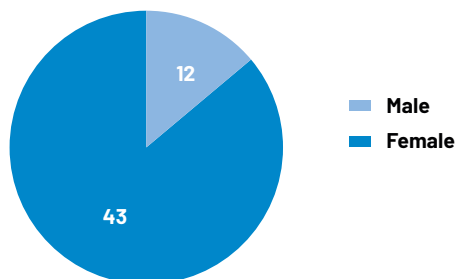
This research was carried out from January, 2022 to October, 2022 in Hayatabad Medical Complex Hospital and Khyber Teaching Hospital, Medical Teaching Institute Peshawar, Pakistan. In this research, patients who had port site infections (PSI) following LC were included. Patients with coexisting pancreatitis, cholangitis, or incomplete data were excluded from this research. Only 55 of the 907 patients who had LC surgeries were included in our research because they had PSI. An interventional radiologist performed ultrasound (US)-guided trans-hepatic PC under local anesthesia with a pigtail catheter. In all groups, oral food intake was regulated on the basis of patient's medical condition, and the decision to discharge was evaluated based on food tolerance. In all operations, the gallbladder is retrieved from epigastric port without the

use of a retrieval bag by skilled surgeons employing four-port methods and reusable equipment. Most patients had the sub-hepatic tube drain placed, and they were released the day following surgery. On the seventh day following surgery, the sutures were removed without any signs of infection. All PSI-affected patients had sensitive swabs that were fermented. Patients who have chronic, incurable illnesses have tests with general anaesthesia, have their persisting sinuses removed, have their sinuses dissected, and then have the incision left open to recover for another reason. Chronic sinus excisional biopsies were made, sent to the histological evaluations, and samples were examined using PCR (PCR). Participants with tuberculosis (TB) received oral anti-TB treatment for 9 months. After six months of follow-up, all patients showed good responses. To reduce bias in the study, patients whose functions were changed to open procedures and those who had a record of persistent co-morbid diseases were excluded from the study. We gather information from seasoned surgeons who have adequate documentation and postoperative follow-up in the same purpose and to prevent iatrogenic issues for beginning surgeons. The level of experience is determined by how long they have been performing laparoscopic operations (at least ten years), how many surgeries they have had, and how long each surgery lasted (20-90 minutes). In our research, variables such gender, the site of the infected port, the kind of microorganisms, the degree of infection, and the presence of bile stones, or redness in the procedure were examined. The sample's sterilizing procedure involved washing the equipment with ENZYM (50cc), rinsing with water, and then removing CIDEX® OPA solution for 30 minutes. A pre-designed questionnaire was used to collect all the information, and statistical analysis was carried out. SPSS (v.25) was used to examine the data. Descriptive statistics were used for demographic and clinical features. The results were presented as percentages for continuous variables and the number/percentage for categorical variables. The Chi-square test was used to assess the importance of the association such as gender-wise comparison, PSI occurrence in several port locations and relationship between the prevalence of PSI and the preoperative clinical diagnosis of gallbladder.  $P \leq 0.05$  was regarded as the significant value. The Helsinki Declaration's guiding principles guided the conduct of this study. Each and every patient who participated gave their written informed permission.

## RESULTS

907 individuals who undergone LC are included in this study. They were between the ages of 20 and 65. Out of 907 patients, PSI was discovered in 55 (6.06%). In respect to gender, the PSI percentage was 4.74% for 43 female

patients and 1.32% for 12 male patients (figure 1).



**Figure 1:** Frequency of male and female patients

Regarding the condition of the gallbladder before to surgery, 34 patients (3.5%) had chronic cholecystitis (CC), whereas 21 patients (2.31%) underwent surgery following an acute cholecystitis (AC) (Table 1).

Condition	Infected (%)
ACCC	21 (2.31%)
Total	34 (3.74%)

**Table 1:** Relationship between the prevalence of PSI and the preoperative clinical diagnosis of gallbladder

Only five patients (0.55%), based on the PSI, got an infection at the lateral ports, whereas 11 patients (1.21%) and 39 patients (4.29%) respectively, developed infections at the umbilical and epigastric ports (Table 2).

PSI	n (%)
Umbilical	11 (1.21%)
Epigastric	39 (4.29%)
Lateral	5 (0.55%)
Total	55

**Table 2:** PSI occurrence in several port locations

## DISCUSSION

Literature shows that the ultimate treatment for cholecystitis is an LC [20, 21]. In other patients who are not suitable candidates for surgical treatment, it is common practice to perform a cholecystostomy if there is no improvement within one to three days after starting antibiotic treatment unless sepsis is present. However, for reasons, such as concomitant diseases and sepsis, surgery may not always be appropriate or safe for every patient. PC, which is a potentially life-saving and less invasive treatment option, may be preferred for patients in this category [22, 23]. Since laparoscopic operations become less intrusive and have a reduced influence on the immune system than open surgery, the incidence of PSI following LC is lower than that following an open cholecystectomy. The majority of individuals who performed LC were observed to be women, which are similar to the findings by Khursheed et al. and Kumari and Narain [24, 25]. Furthermore, PSI in both the studies came from majority of the female patients which are similar to the findings of current research and significant association

was found in the frequency of PSI in relation to gender. All the patients were diagnosed negatively with COVID-19. Almost similar findings were observed in a recent research [22,23]. Patients were more likely to get the infections during the critical period compared to the chronic phase [26]. The current results were almost similar with the statement of Dai et al and findings of Opal et al as only five patients, based on the PSI, got an infection at the lateral ports, whereas 11 patients and 39 patients respectively, developed infections at the umbilical and epigastric ports [26, 27]. P-value was 0.002, which is quite significant, and the location of the gallbladder removal may have contributed to PSI. These findings are in line with the Tevis et al [28]. This is because having a firm, flexible gallbladder with a thick wall of edoema increases the likelihood of the gallbladder perforating and dislocating, developing stones, or becoming red.

## CONCLUSIONS

Mostly in initial management of AC, PC was suggested and chosen to surgery, particularly in high-risk, chronically sick patients. Females tend to have high PSI rates and frequent epigastric port PSIs. The length of the procedure and AC may be factors in the development of a port-site infection. It is essential to pay close attention to the infection caused by persistent deep surgeries. It is essential to pay close attention to the infection caused by persistent deep surgeries.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Relationship Between Serum Osteocalcin Levels and Glycosylated Hemoglobin in Type II Diabetes Patients

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## ARTICLE INFO

## Key Words:

Osteocalcin levels, HbA1c levels, Type 2 Diabetes Mellitus

## How to Cite:

Mufti, M. ., Khaliq, N. ., Munir, M. ., Khattak, A. ., Mufti, A. ., Hassan, B. ., Ansari, F. ., & Ansar, F. . (2022). Relationship Between Serum Osteocalcin Levels and Glycosylated Hemoglobin in Type II Diabetes Patients: Osteocalcin Levels and Glycosylated Hemoglobin in Diabetes Patients. *Pakistan Journal of Health Sciences*, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.369>

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Received Date: 17th October, 2022

Acceptance Date: 21st November, 2022

Published Date: 30th November, 2022

## ABSTRACT

Diabetic osteopathy is a complication of diabetes that elevates the risk of bone fractures and influences bone remodeling. Osteocalcin is a bone protein produced by osteoblasts that plays a role in the regulation of glucose and energy metabolism. **Objectives:** To explore the relationship between the level of glycosylated hemoglobin (HbA1c) and osteocalcin in diabetic patients. **Methods:** This cross-sectional analytical study was carried out at Hayatabad Medical Complex, Peshawar from January 2017 to February 2018. A total of 100 patients suffering from Type 2 Diabetes Mellitus (T2DM) were recruited. HbA1c and osteocalcin levels were measured by the enzymatic method and electrochemiluminescence immunoassay, respectively. SPSS was utilized for data entry and analysis; Pearson's correlation was performed to assess the relationship between variables while statistical significance was accepted at  $p < 0.05$ . **Results:** The mean (SD) age of participants was 50 (9.2), while 58% of the study population was female. The mean (SD) HbA1c and osteocalcin levels were 11.3 (8.8) and 13.1 (6.8), respectively. The results of the correlation analysis yielded a negative relationship between HbA1c and osteocalcin levels ( $r = -0.099$ ), but the results were statistically non-significant ( $p$ -value = 0.328). **Conclusion:** Our study suggested that osteocalcin level has a negative correlation with HbA1c level in Type 2 Diabetes Mellitus patients.

## INTRODUCTION

Type 2 Diabetes Mellitus (T2DM) is a chronic ailment in which the body shows resistance to insulin where target cells are unable to react normally to insulin. Nutritional control and oral hypoglycemics are useful in treatment, but eventually, a patient needs insulin therapy [1]. According to data from 2010 studies, approximately 285 million individuals, constituting roughly six percent of the global population, were suffering from diabetes. Amongst them,

20% of the current diabetic population resides in Southeast Asia. The number of diabetics in developed countries is likely to triple by the year 2025 [2]. In 1980, approximately 108 million individuals were living with diabetes worldwide. However, this number increased to 422 million in 2014. Since 1980, the prevalence of diabetes in the general population has increased by nearly twofold, from 4.7% to 8.5%. This indicates a rise in risk factors like

obesity and sedentary lifestyles. As per statistics of 2012, diabetes contributed to over one and half million fatalities. It is predicted that developing countries will endure the most of this epidemic in the 21st century [3]. Osteocalcin (BGLAP-bone gamma-carboxyglutamic acid-containing protein) is a non-collagen protein hormone found in dentin and bone because it has a Gla domain. Osteocalcin is encoded by the BGLAP gene and its receptors are GPRC6A [4]. Serum osteocalcin levels are a predictor of bone formation and its negative metabolic consequences. Various articles show an inverse association between adverse metabolic outcomes and serum osteocalcin, suggesting that osteocalcin levels should be maintained at normal levels in diabetic patients [5]. Recent studies conclude that serum osteocalcin has a positive role in glucose metabolism and fat accumulation. Osteocalcin works like a hormone in the human body, stimulating beta cells of the pancreas to secrete more insulin, and also direct fat cells to secrete the hormone adiponectin, which also increases its sensitivity to insulin. Osteocalcin alters insulin release and sensitivity,  $\beta$ -cell proliferation, and energy metabolism [6-7]. Uncarboxylated osteocalcin (ucOC) improves insulin sensitivity and enhances insulin release, which has been proven by clinical trials on animal models. Principally, human trials have shown that there is a decrease in total osteocalcin (TOC) values, which is linked with exacerbated glycemic control and insulin resistance [8-10]. This study was aimed to determine HbA1c and osteocalcin levels in diabetic (T2DM) patients and to find out if there were any potential relationships between them..

## METHODS

This cross-sectional study was conducted at Hayatabad Medical Complex (HMC), a public tertiary care hospital situated in Peshawar, Pakistan. The study duration was one year (January 2017 to February 2018), and ethical approval was granted by the Post Graduate Medical Education department, Khyber Girls Medical College (Ref No. 1831/PGMED/KGMC). A total of 100 participants were selected, who were presented to the Medical and Endocrinology department of HMC. Patients already diagnosed with T2DM were included in the study. The criteria for T2DM were based on the American Diabetes Association guidelines, which stated that diabetes was diagnosed when fasting plasma glucose was 7.0 mmol/L, or 2-hour oral glucose tolerance test (OGTT) was 11.1 mmol/L, or HbA1c was 6.5%. However, any patient who was suspected or diagnosed with a disease that could potentially alter bone metabolism was excluded. Patients with cushing syndrome, acromegaly, thyroid disease, osteoporosis, ankylosing spondylitis, rheumatoid arthritis,

hyperparathyroidism, liver failure, chronic kidney disease, and other similar conditions were deemed ineligible for the study. Patients who were on corticosteroids, synthetic hormones, or bisphosphonates were also excluded from the study. A detailed history and clinical examination were performed, and the patient's files were reviewed in detail to strictly meet the inclusion criteria. Participants were informed about the nature and purposes of the study, and a written consent form was also signed. All participants were assured of their confidentiality and were given the option to withdraw from the research at any time. Furthermore, no monetary remuneration was provided to individuals for their participation in the study. Fasting blood samples were collected, centrifuged, and stored at  $-25^{\circ}$  C until analysis. The blood specimens were then sent to the Pathology Department at Rehman Medical Institute (RMI), Peshawar because of the availability of standard kits and laboratory services needed for the present study. Glycosylated hemoglobin A1c (HbA1c) was measured utilizing EDTA (Ethylenediamine tetraacetic acid) tubes through an enzymatic method using ARCHITECT ci8200 (Abbott®, Abbott Park, Illinois, U.S.A) while serum osteocalcin concentration was measured using an electrochemiluminescence immunoassay (Cobas 601, Roche Diagnostics). SPSS version 22.0 (SPSS Inc., Chicago, IL) was used for data entry and analysis. Data entry was performed by research assistants and was cross-checked by other members for any potential errors. Where appropriate, descriptive statistics were presented as means, standard deviations, and percentages. Pearson's correlation test was performed to find out any potential relationship between study variables. For statistical significance, a p-value of  $< 0.05$  and a 95% confidence interval were considered significant.

## RESULTS

There were 100 participants in the present study. The mean (SD) age of the study subjects was 50 (9.2) (range: 40-65 years). 28% of patients were in the age range of 40-45 years; 32% of patients were in the age range of 46-55 years; and 40% of patients were in the age range of 55-65 years. Gender wise, 58% of the participants were female and 42% were male.

Variable	Total	Male	Female
Age	50 $\pm$ 9.2 years	48 $\pm$ 6.3	52 $\pm$ 7.6
Duration of T2D	9.76 $\pm$ 4.2 years	9.2 $\pm$ 3.8	9.98 $\pm$ 4.8
MBMI	28.56 $\pm$ 3.1	28.11 $\pm$ 3.2	28.96 $\pm$ 2.9
Comorbidities			
Hypertension	62	27	35
Cardiovascular disease	34	16	18
Obesity	73	34	39
Osteoporosis	16	3	13

Medications			
Sulfonylureas	46	20	26
Metformin	67	30	37
Insulin	33	21	12

**Table 1:** Baseline characteristics of study population

The mean (SD) and median serum osteocalcin levels were found to be 13.13 (6.8) ng/mL and 11.7 ng/mL, respectively (range: 5.0-7.0 ng/mL). The mode value of serum osteocalcin levels was 9 ng/mL, indicating that the majority of the patients presented with 9 ng/mL of serum osteocalcin levels. The normal of data were skewed towards the lower extreme, demonstrating that osteocalcin levels decreased during disease. The mean (SD)HbA1c was 11.36(range; 6%-86%)while the median was 10.05%, indicating that 50% of the patients had an HbA1c level above 10.05%. The normal curve shows that the HbA1c of diabetic patients is more skewed toward the highest value, implying that HbA1c is a good predictor of the chronic effect of diabetes. HbA1c levels were 6.5%-8.0% in 26% of patients, 8.1%-10% in 28% of patients, 10.1%-15% in 42% of patients, and more than 15.1% in 4% of patients, respectively (Table 2).

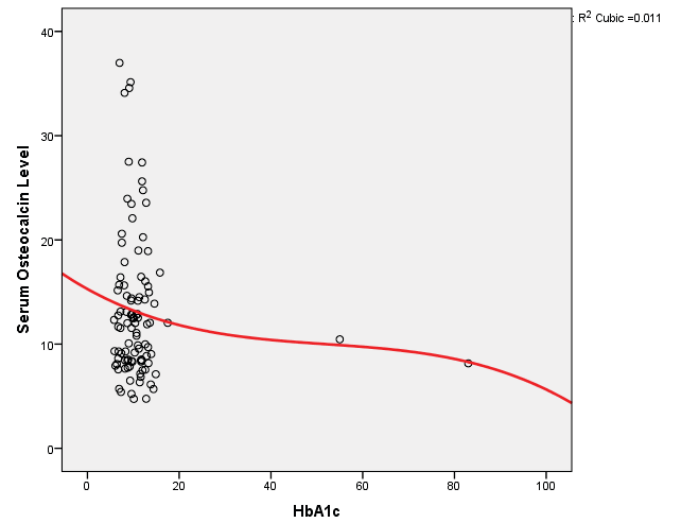
Variable	Total	Male	Female
Mean Osteocalcin levels	13.13 ng/mL	12.24 ng/mL	13.98 ng/mL
Mean HbA1C levels	11.36 %	11.16 %	11.45 %
Median Osteocalcin levels	11.7 ng/mL	11.2 ng/mL	11.7 ng/mL
Median HbA1C levels	10.05%	10.80%	10.01%

**Table 2:** Mean and median of variables

As indicated from the descriptive statistics, the mean serum osteocalcin and HbA1c levels were 13 (6.8) ng/L and 11% (8.8%) respectively. Pearson's correlation analysis revealed that there was a weak inverse relationship between serum osteocalcin and HbA1c levels; however, the results were statistically non-significant ( $r = -0.099$ ,  $p$ -value = 0.328) (Figure 1). However, BMI and Age were positively correlated with the HbA1c as shown in (Table 3).

Variable	Total		Male		Female	
	r	p-value	r	p-value	r	p-value
Serum Osteocalcin	-0.099	.328	-0.121	.541	-0.091	.046
BMI	0.324	.046	0.312	.061	0.341	.048
Age	0.181	.112	0.172	.213	0.189	.096

**Table 3:** Shows correlation between HbA1c and other variables.



**Figure 1:** Correlation between serum osteocalcin levels and HbA1c levels

## DISCUSSION

It is generally acknowledged that Type II diabetes mellitus is a complicated metabolic disorder driven by the combination of several factors, including hereditary, ecological, and life-style factors. In multiple studies, researchers have suggested that in individuals with Type II diabetes mellitus, serum osteocalcin was linked with glucose tolerance [10-11]. Osteopathy related to diabetes is one of the most crucial problems and needs prompt intervention as it may lead to an increased risk of bone fracture and ill adaptation of bone metabolism. Osteocalcin is one of the bone proteins that plays an important role in bone metabolism and maintains bone density and integrity. From a metabolic perspective, osteoblasts produce osteocalcin, which was involved in glucose metabolism and produces energy in the form of Adenosine Tri-Phosphate (ATPS). However, in diabetes, the deranged metabolism leads to a decrease in the osteocalcin levels [12]. HbA1c levels may represent the possible role of osteocalcin in glucose metabolism in patients with type 2 diabetes mellitus. Maddaloni et al., reported that diabetes and osteoporosis are two very common diseases with a great socio-economic impact [13]. Patients with Type-2 diabetes mellitus have altered bone density and have an increased risk of bone fractures. The results of osteoporosis treatment in patients with diabetes are not satisfactory [14]. An HbA1c of 48 mmol/mol (6.5%) is considered as the cut-off point for diagnosing diabetes. HbA1c less than 48 mmol/mol (6.5%) necessitates additional testing, such as oral glucose tolerance tests (OGTT) [15]. The results indicate that the mean serum osteocalcin level was  $13.13 \pm 6.899$  ng/ml (reference values for > 18 years: 9-38 ng/mL) while the mean HbA1c  $11.36 \pm 8.862\%$  (reference value > 6.5%),

indicating that almost all of them have chronic diabetic conditions. While the mean osteocalcin level was within an acceptable range, the median of data showed that 50% of the samples had osteocalcin levels greater than 15 ng/ml, indicating increased bone turnover. John et al., revealed that in cases of type 2 diabetes, osteoblastic activities of the bone forming cells/tissue are impaired, but the reabsorption remains normal or improved [16]. The osteocalcin level in the present study also supports this mechanism as shown from the range which comes under the reference range. However, most of the results are skewed toward the upper border of the reference ranges. HbA1 was found to be inversely related to osteocalcin ( $r = 0.099$ ,  $p = 0.328$ ). Bao et al., which demonstrates a raised osteocalcin level in serum ( $p = 0.014$ ), while parameters identified with glucose variability, the standard deviation of plasma glucose values, and mean adequacy of glycemic expedition (MAGE), diminished fundamentally ( $p < 0.001$ ) after treating patients for 8 weeks [17]. At standard, the connection between homeostatic model appraisal of  $\beta$ -cell capacity ( $P = 0.048$ ) and fasting C-peptide levels and serum osteocalcin levels ( $p = 0.004$ ) was positive. However, the relationship between serum osteocalcin levels and 24 h mean blood glucose ( $P < 0.001$ ), HbA1c ( $p = 0.020$ ) and fasting plasma glucose ( $p = 0.023$ ) was negative. It was concluded that serum osteocalcin foci expanded with enhanced glucose control. Gundberg et al., reported that changes in glucose variability (controlling glucose) by hypoglycemic agents were linked with early high levels of osteocalcin (i.e., maintaining serum osteocalcin level) [18]. This indicates that osteocalcin could be used to enhance the glucose-related metabolism aspect of energy regulation. Previous research found that osteocalcin was strongly linked to carbohydrate metabolism due to changes in pancreatic cell ( $\beta$ -cell) proliferation and increased insulin sensitivity [19]. In Gu et al., study animal model has shown similar results and reported cognitive impairment in subjects with decreased serum osteocalcin levels [20]. However, a proper clinical trial on an animal model is required to see the effect of osteocalcin therapy among diabetic subjects. The current results cannot be generalized; however, they can be used as a basis for further research.

## CONCLUSIONS

The present study suggested that osteocalcin level has a negative correlation with HbA1c level in Type 2 Diabetes Mellitus patients. The poor control of diabetes can significantly lead to diabetic osteopathy, and patients can experience different bone disorder, including bone deformity, frequent fractures, and limited bone turnover.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## The Effect of Metacognition Regulation Evaluation on Medical Student Progress

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## ARTICLE INFO

## Key Words:

Metacognitive Regulation, Metacognitive Knowledge, Metacognition Awareness, Medical Undergraduates, Academic Success, Medical College

## How to Cite:

Iqbal, S. ., Sukhera, S. ., Aslam, F. ., Hayat Sukhera, K. ., & Zafar, A. . (2022). The Effect of Metacognition Regulation Evaluation On Medical Student Progress: Metacognition Regulation Evaluation on Medical Student Progress. *Pakistan Journal of Health Sciences*, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.180>

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Received Date: 27<sup>th</sup> September, 2022Acceptance Date: 16<sup>th</sup> November, 2022Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

Cognition is the scientific term referring to the mental processes involved in gaining an understanding of knowledge including, judging, thinking, reasoning, knowing, remembering, and problem-solving. **Objective:** To observe metacognition's impact on medical students' academic achievement. **Methods:** It was a cross-sectional analytical study. Three medical colleges were surveyed to obtain data from second-year medical students. The data from the Metacognitive Awareness of Reading Strategies Inventory (MARS-I) and each student's first-year academic achievement information were collected from January to June 2021. A simple random sampling procedure. Academic performance was a dependent variable, while the metacognitive score was an independent variable. Three hundred thirty-two students participated in the survey. **Results:** With a correlation coefficient value of 0.257, the findings indicated a significant link between metacognition and academic success ( $p < 0.01$ ). Metacognition levels among medical students from various colleges are nearly identical. **Conclusions:** Current study findings have shown that all three dimensions are positively and strongly correlated to each other.

## INTRODUCTION

Cognition is the scientific term referring to the mental processes involved in gaining an understanding of knowledge including, judging, thinking, reasoning, knowing, remembering, and problem-solving. So, Metacognition refers to thinking and regulating one's cognition. It constructs active learning and higher educational performance, likely because it gives the students a way to evaluate and take charge of their own learning [1,2]. "Metacognition" is thinking about thinking or re-thinking [3]. Metacognition includes control of planning, monitoring, awareness, repairing, reasoning,

summarizing, evaluating, devising a goal, and appropriate behavior [4]. First is metacognition awareness, in which a person is aware of their own cognitive process, and second is metacognition management [5]. Global reading strategy, problem-solving strategy, and support reading strategy are all necessary for the management of metacognition. Every person chooses a strategy based on the occasion and context [5, 6]. Academic accomplishments are some learning goals that students have [7]. These goals can be met by putting an emphasis on learning, having a solid comprehension of the material, and completing difficult

assignments [2, 3]. According to Özsoy (2009), students' accomplishments can be evaluated by their high levels of performance, self-efficacy, and metacognition regulation [8]. Metacognition plays an important role in learning processes, in particular among medical students to reach their intended objectives. Metacognition enables the student to be more engaged in the learning process by enabling them to construct, monitor, and evaluate a plan to maximize its effectiveness [9]. Many studies reveal a high correlation between students' metacognition levels and academic success [10-12]. These medical students may be on the front lines conducting evaluations when resources and time constraints are at play because metacognitive abilities are becoming an increasingly important part of the training of health professionals [13]. As there is trace evidence that explores metacognition evaluation and its regulation in undergraduate medical students of Pakistan [14], Determining how medical students regulate their metacognition and how it affects their academic performance is the goal of the current study. This study will help medical students develop their metacognitive abilities and meet their academic objectives because doctors are expected to function flawlessly, professionally, and independently as lifelong learners who can continually add to and expand upon their prior knowledge. Students will be assisted in achieving their academic objectives by the study's findings, which will also help policymakers and other interested parties make better decisions.

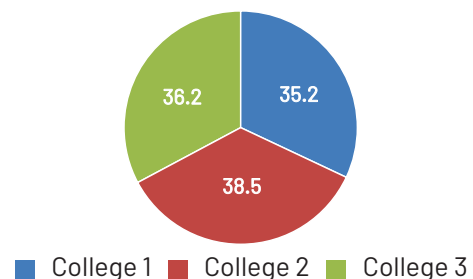
## METHODS

The current study was analytical cross-sectional. The duration was six-month from January to June 2021 at three different medical colleges in Punjab. In this study, a probability sampling technique called simple random sampling was applied. Students were selected randomly from new 2nd-year MBBS classes. The questionnaire was filled out under the supervision of a class representative. The student's verbal consent was obtained and secrecy and privacy were ensured. The data was compiled using SPSS 20.0 after the response forms from the students were gathered, coded, and collected. Collected academic performance (first annual professional part 1 results) was the dependent variable. Inclusion Criteria: All those students who cleared the first professional MBBS exam on the first attempt. Exclusion Criteria: All detainees and absent students were excluded. The selected questionnaire, the Metacognitive Awareness of Reading Strategies Inventory (MARS-I) was introduced by Kouider Mokhtari and Carla A. Reichard [6], were used. This 30-item questionnaire was created specially to assess reading comprehension and adult metacognition. Three broad areas of reading strategies make up the questionnaire, including Global-Reading Strategies: Setting a

determination for content reading, text previewing, or assuming what the material is about involves doing this. Problem-Solving Strategies: This is a restricted and focused problem-solving strategy used when problems develop in understanding documented information. Support-Reading Strategies: This entails the use of support systems or technologies designed to maintain receptivity to reading.

## RESULTS

This study focuses mainly on the relationship between the metacognition skills of undergraduate medical students and their academic records. Academic achievements have been measured in relations of first professional examination scores. And we used freely available standard scale for the measurement of "Metacognition awareness regulation score inventory" (MARS-I). After that, correlation tests were used to see the relationship between the main study variables. Figure 1 chart is the presentation of a qualitative variable (college type). This chart has shown that respondents of the current study have been selected from three different medical colleges. Approximately 36.2% of data sample have been selected from the first college type, and 35.2% of the sample was from 2-second college, remaining part was selected from college three.



**Figure 1:** Pie chart for college type

Table 1 has data about the study variables like scores of first professional examinations and three main dimensions of Metacognition awareness, like mean score of global reading strategies, the total score of global reading strategies, etc.

Main Variables	N	Minimum	Maximum	Mean±SD
Marks	331	323.00	472.00	397.4156±38.68300
Mean of Global Reading Strategies	332	1.46	4.77	3.6012±.60244
Total Score of Global Reading Strategies	332	19.00	62.00	46.8147±7.83074
Mean of Support Strategies	332	1.56	5.00	3.5809±.61263
Total Score of Support Strategies	332	14.00	45.00	32.2284±5.51538
Mean of Problem-solving	332	1.38	5.00	3.8907±.62357
Total score of Problem-solving	332	11.00	40.00	31.1034±4.98896
Mean score of Metacognition	332	4.47	14.37	11.0702±1.64779
Total score of Metacognition	332	45.00	143.00	110.1466±16.50043

**Table 1:** Descriptive Statistics

Table 2 shows the three dimensions of metacognition and total Metacognition were explained through their total scores and mean scores. Further, each variable is mentioned here in its minimum and maximum value in the

respondents, mean score, and standard deviation of variables. Variable marks were used as a determinant of academic achievement. In the sample of 332 students, the minimum score was 323 and the highest score was 472. thus with standard deviation, the student's average marks were approximately  $398 \pm 38$ . The first dimension of Metacognition is Global reading strategies which have a minimum mean value is 1.46 and a maximum is 4.77 with a standard deviation is 0.60. All dimensions of Metacognition almost have similar variation levels and minimum and maximum values. It shows that medical students have similar scores on three dimensions of Metacognition; Global reading strategy, support strategy, and problem-solving strategy. There are 30 items of questionnaires measured on a 5-point Likert scale. This average score showed that medical students have a sufficient level of Metacognition and respective dimensions.

		Total Global Reading Strategies score	Total Support Strategies score	Total Problem-solving score
Total Score of Global Reading Strategies	Pearson Correlation	1	.730**	.708**
	Sig. (2-tailed)		.000	.000
	N	332	332	332
Total Score of Support Strategies	Pearson Correlation	.730**	1	.676**
	Sig. (2-tailed)	.000		.000
	N	332	332	332
Total score of Problem-solving	Pearson Correlation	.708**	.676**	1
	Sig. (2-tailed)	.000	.000	
	N	332	332	332

**Table 2:** Correlations among three dimensions of metacognition  
 \*\*. Correlation is significant at the 0.01 level (2-tailed).

## DISCUSSION

This study has mainly focused on analyzing and comparing the ability and regulation of metacognition in medical college students and their relationship with academic achievements. A researcher assumed that the ability of the student to think (Metacognition) is related to student grades (Predictor of academic achievement). Second, the researcher assumed that there is no difference in metacognitive abilities among students from different medical colleges. Both hypotheses were tested earlier through correlation coefficient and independent sample t-tests respectively. Previously, researchers have had a great discussion on the relationship between academic accomplishment and metacognition abilities. Because of its versatile nature and applications, this issue has been addressed by health educators, medical professionals, and psychologists. This study has the hypothesis that there would be a positive relationship between these two concepts. And the results have been found. There is a significantly strong and positive relationship between metacognition scores and academic achievements. Many researchers have shown and reported that academic

performance is a correlate of metacognitive ability [15]. The greater the ability, the higher the academic scores, and vice versa. According to research results, students with high scores of Metacognition scores are good organizers, active planners, have tasks completed in a given period of time, have the ability to monitor the path of their learning and understanding, and are swift and flexible by nature. These all support them in their academic endeavors, and as a result, they perform well [16]. Similarly, another showed that both types of goals are linked with academic performance and success through Metacognition skills. He also highlighted that students having higher mastery goals would be able to comprehend the phenomenon and ultimately have higher metacognition abilities which further elaborates its impact on academic achievement [7]. This result was corroborated by a different researcher, who showed that there is a substantial correlation between metacognition, learning, and goal mastering, all of which have a favorable impact on student's academic success. These findings were adjusted for gender, age, and intellectual ability [17]. Another researcher reported a similar type of finding, namely that students with higher levels of metacognitive skills perform better in summative exams [18]. All these researches which have been discussed here have found the same conclusion that there is a significant correlation between these two educational psychology concepts; Metacognition and academic achievement. It shows that the researcher's main hypothesis of the study has been proved. Further, it would be beneficial for the students that if there is a low academic achievement in the students then it can be raised and made better by creating and enhancing their metacognitive skills. Another finding from our study is that there are no appreciable learning style differences among medical college students as a whole. The study anticipated that all applicants to medical schools would typically be exceptional students, high performers, and have stellar academic records [19]. They have proven their skills in classes for intermediate students. Their modes of thought, venues for teaching and learning, academic assessments, and workload are quite similar. It is quite likely that they have the same level of metacognitive abilities in each of these circumstances [20]. An Independent sample t-test was used to evaluate this investigation. The fact that all student groups fall into the same age category is a key justification for these findings. Many Researchers support different studies that have shown that metacognitive abilities change with age [5, 21]. In other words, it may be deduced that individuals of similar ages will possess nearly identical metacognitive abilities. Additionally, to these findings, it has also been found that medical students have a high level of Metacognition scores in both colleges

(approximately 109 and 110 respectively). This finding is indirectly measuring the first hypothesis of the study which is about the awareness level of Metacognition in medical students [1]. According to this study, medical students have strong metacognitive control skills. Numerous studies have revealed that medical students excel in their metacognition and academic performance [22]. These researchers compared medical college students and other college students and discovered that their metacognition scores differed significantly. Medical students have higher scores in academic activities and metacognitive skills. As they have to perform in multiple ways in medical education which enhance their thinking pattern about thinking and comprehending the situations of learning.

## CONCLUSIONS

Current study findings have shown that all three dimensions are positively and strongly correlated to each other. Because they are all predictors of the basic concepts of metacognition, it is a chance that they will be correlated. Higher the score in one dimension, the higher the score in another dimension, and vice versa. In general, working on one dimension would be useful for mentors and trainers because it would improve other learning techniques and tactics.

## Conflicts of Interest

The authors declare no conflict of interest.

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Association of Vocal Fatigue and Years of Experience in practicing Speech and Language Pathologists

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## ARTICLE INFO

## Key Words:

Speech and Language Pathologists, Vocal Fatigue, Vocal Fatigue Index

## How to Cite:

Ijaz, A., Yaqoob, S., Mansoor, A. F., Aziz, S., & Masood, F. (2022). Association of Vocal Fatigue and Years of Experience in practicing Speech and Language Pathologists: Association of Vocal Fatigue and Years of Experience in Pathologists. *Pakistan Journal of Health Sciences*, 3(06).  
<https://doi.org/10.54393/pjhs.v3i06.365>

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Received Date: 15<sup>th</sup> October, 2022Acceptance Date: 10<sup>th</sup> November, 2022Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

SLPs (Speech and Language Pathologists) are healthcare specialists that specialize in the areas of swallowing and communication across the lifespan. While communication comprises speech production, language, fluency, voice, hearing, cognition, resonance and swallowing involves all aspects of swallowing, including related feeding habits. According to the definition of vocal fatigue, it is "the perception of voice user, manifested mostly as an increased vocal effort that develops over time with voice usage and reduces with voice rest." **Objective:** To explore an association of vocal fatigue and years of experience among practicing Speech and Language Pathologists. **Methods:** A cross-sectional study was held with sample size of 80 participants' using quota sampling technique. Vocal Fatigue Index questionnaire was used to collect data from SLPs which consists of 19 items having factor 1 (tiredness of voice), factor 2 (physical discomfort) and factor 3 (improvements of symptoms with rest). **Results:** The mean score of tiredness of voice (factor 1) was  $20.15 \pm 7.18$  having Pearson correlation of 0.470, mean score of physical discomfort (factor 2) was  $8.30 \pm 4.156$  having Pearson correlation of 0.393 and the mean score of improvement of symptoms with rest (factor 3) was  $7.86 \pm 2.814$  having Pearson correlation of -0.063. The mean year of experience was  $2.38 \pm 1.49$ . **Conclusions:** As the age of Speech Language Pathologist increased, they become more experienced but they decreased their workload by reducing their medical practices in this way their vocal fatigue decreases automatically. Hence as the years of experience increases the vocal fatigue of SLPs decreases.

## INTRODUCTION

Professionals who engage in professional practice in the aspects of swallowing and communication across the lifetime are known as speech and language pathologists (SLPs) [1]. According to the definition of vocal fatigue, it is "the perception of the voice user, manifested mostly as an increased vocal effort that develops over time with voice usage and reduces with voice rest" [2]. When compared to the general population, which has greater rates of voice problems (6-15%), instructors are more likely to experience voice abnormalities (between 15% and 80%) [3]. According to a review of the literature, vocal tiredness affects 18% to 33% of professional voice users [4]. Both physiological

(acoustic analysis and electro-myographic analysis) and self-perceived measurements can be used to assess vocal tiredness. It's possible that not all clinical settings will voluntarily allow for the assessment of vocal fatigue using physiological markers [5]. Vocal tiredness can be impacted by intrinsic and external variables, which can either slow or speed up the onset of its symptoms. Extrinsic voice factors include environmental elements including humidity, room acoustics, and background noise. The subject's voice use is influenced by intrinsic characteristics such as voice quality, phonation type, fundamental frequency, duration of phonation, and

intensity of voice, as well as biological factors such as age, gender, hormones, heredity, and the biochemistry of the vocal folds [6]. Extrinsic factors are frequently changed to amplify the negative consequences of protracted voice use. For instance, voice production may suffer with airway dehydration [7]. Erkan *et al.*, did research to scores from the VAS and the Vocal Fatigue Index, Version II, were used. In doctors who saw more patients, voice fatigue was more noticeable. Physicians with a long career and more frequent daily patients reported experiencing physical discomfort more frequently [8]. In 2019, Moghtader *et al.*, viewed university professors as professional voice users who, like teachers, are susceptible to vocal disorders and complaints because of their line of work. This research examines the association between the vocal handicap index and the vocal fatigue index both with and without [9]. The third component of the vocal fatigue index was the only one that did not have a significant association with the vocal handicap index. According to the study's findings, academics' quality of lives was negatively impacted by vocal fatigue [10]. In Eric *et al.*, study voice tiredness was a common complaint among that population that was reported in increased numbers [11]. An online survey that included a vocal fatigue index (VFI) was utilized to collect data from these teachers. According to the findings, instructors were three times more likely to experience vocal avoidance or vocal fatigue as compared to healthy, normal persons [12]. In 2021 a study to determine the proportion of SLPs who reported vocal tiredness, the likely causes of vocal fatigue, preventative methods, and the impact on their personal and professional lives [13]. According to the study's findings, 71.13% of SLPs experience vocal fatigue. Vocal fatigue was reported to have a negative impact on 59% of SLPs' professional lives and 44% of their personal lives. Speaking aloud, frequently clearing one's throat, using one's voice for an extended period of time, dehydration, using one's voice for amusement, and working in an air-conditioned or noisy setting are the most commonly mentioned contributing factors. Vocal tiredness in SLPs carries a danger of developing into organic voice abnormalities if addressed [14]. This study aim was to investigate the relationship between vocal tiredness and years of experience among working speech and language pathologists. According to the literature, voice abuse causes vocal fatigue in young speech-language pathologists (SLPs), teachers, singers, and the general public. The association between vocal fatigue and the number of years of SLP experience has not yet been researched [15]. Rationale of this study was to find vocal fatigue in SLP's according to their years of experience.

## METHODS

The study design of this study was cross sectional study. The duration of this study was 06 months. Sample size of 80 Speech and Language Pathologists participated in this study and convenient sampling technique was used. Speech and Language Pathologists working in hospitals, private practice and educational institutes were included in the study. SLP's with any comorbid disease like organic voice disorder were excluded from the study. SLP's with less than 01 year and more than 05 years of experience were excluded. Consent was taken from the SLP's before handing over the questionnaires. They were well informed about the pros and cons of the study. The tool used was Vocal Fatigue Index questionnaire to gather data from SLP's. Questionnaire consists of 19 items. Eleven items comprised one major factor, "tiredness of voice". Five items comprised a second factor "physical discomfort". The third factor consists of three items, "improvement of symptoms with rest". Questions for factor 1 and 2 are worded negatively, such that higher values indicate worse VF (for factor 1, a score  $\geq 24$  indicates VF and for factor 2, a score of  $\geq 7$  indicates VF). On the other hand, for factor 3, questions are worded positively, such that lower values indicate worse fatigue (a score of  $\leq 7$  indicates that vocal fatigue does not improve with rest). Another questionnaire for the collection of demographics was used. It includes the information section of gender, age, qualification, work setting and experience of samples respectively.

## RESULTS

A sample of 80 was collected from different areas of Lahore. 69 (86.25%) were females and 11(13.75%) were males. Age of the participants were between 23 and 35years. 48 (60.0%) were in range of 23-25 years of age, 21 (26.3%) were in age range of 26-28 years, 8 (10.0%) were in age range of 29-31 years and 3 (3.8%) were in age range of 32-35 years. Out of 80 participants, 51 (63.8%) hold degree of BSc Speech and Language Pathology, 8 (10.0%) hold degree of MS Speech and Language Pathology with no back ground of BSc SLP and 21 (26.3%) hold degree of both BSc and MS SLP. Out of 80 participants, 37 (46.3%) were working in hospitals, 18 (22.5%) were working in private clinics and 25 (31.3%) were working in educational institutes. Out of 80 participants, 36 (45.0%) had experience of 1 year, 10 (12.5%) had experience of 2 years, 13 (16.3%) had experience of 3 years, 10 (12.5%) had experience of 4 years and 11 (13.8%) had experience of 5 years (Table 1).

Demographic Details		N (%)
Gender	Female	69 (86.3)
	Male	11 (13.8)
	23-25years	48 (60.0)



Age	26-28years	21(26.3)
	29-31years	8(10.0)
	32-35years	3(3.8)
Qualification	BSc SLP	51(63.8)
	MSSLP	8(10.0)
	Both MS and BSc	21(26.3)
Setting	Hospital	37(46.3)
	Private	18(22.5)
	Educational institutes	25(31.3)
Experience	1year	36(45.0)
	2years	10(12.5)
	3years	13(16.3)
	4years	10(12.5)
	5years	11(13.8)
	Total	80(100.0)

**Table 1:** Representation of demographic information of participants

Speech language pathologist who responded for this study were 80 in number. According to their perceptions. "I don't feel like talking after a period of voice use" has mean  $\pm$  SD of  $1.89 \pm 0.886$ . "My voice feels tired when i talk more" has mean  $\pm$  SD of  $2.31 \pm 0.908$ . "I experience increased sense of effort with talking" has mean  $\pm$  SD of  $1.75 \pm 1.108$ . "My voice gets hoarse with voice use" has mean  $\pm$  SD of  $1.80 \pm 0.947$ . "It feels like work to use my voice" has mean  $\pm$  SD of  $1.80 \pm 1.084$ . "I end to generally limit my talking after a period of voice use" has mean  $\pm$  SD of  $2.04 \pm 0.974$ . "I avoid social situations when I know I have to talk more" has mean  $\pm$  SD of  $1.76 \pm 1.094$ . "I feel i cannot talk to my family after a work day" has mean  $\pm$  SD of  $1.53 \pm 0.968$ . "It is effortful to produce my voice after a period of voice use" has mean  $\pm$  SD of  $1.94 \pm 0.946$ . "I find it difficult to project my voice with voice use" has mean  $\pm$  SD of  $1.63 \pm 0.905$ . "My voice feels weak after a period of voice use" has mean  $\pm$  SD of  $1.71 \pm 0.917$ . "I experience pain in the neck at the end of the day with voice use" has mean  $\pm$  SD of  $1.55 \pm 1.005$ . "I experience throat pain at the end of the day with voice use" has mean  $\pm$  SD of  $1.68 \pm 1.188$ . "My voice feels sore when i talk more" has mean  $\pm$  SD of  $1.86 \pm 0.951$ . "My throat aches with voice use" has mean  $\pm$  SD of  $1.86 \pm 0.951$ . "I experience discomfort in my neck with voice use" has mean  $\pm$  SD of  $1.54 \pm 1.147$ . "My voice feels better after I have rested" has mean  $\pm$  SD of  $2.71 \pm 1.116$ . "The effort to produce my voice decreases with rest" has mean  $\pm$  SD of  $2.48 \pm 1.147$ . "The hoarseness of my voice gets better with rest" has mean  $\pm$  SD of  $2.68 \pm 1.065$  (Table 2).

Questions	N(%) Total number=80
<b>Factor 1 (Tiredness of voice)</b>	
I don't feel like talking after a period of voice use.	69(86.25)
My voice feels tired when I talk more.	72(90)
I experience increased sense of effort with talking.	53(66.25)
My voice gets hoarse with voice use.	61(76.25)
It feels like work to use my voice.	55(68.75)

I tend to generally limit my talking after a period of voice use.	48(60)
I avoid social situations when I know I have to talk more.	57(71.25)
I feel I cannot talk to my family after a work day.	59(73.75)
It is effortful to produce my voice after a period of voice use.	61(76.25)
I find it difficult to project my voice with voice use.	68(85)
My voice feels weak after a period of voice use.	60(75)
<b>Factor 2 (Physical Discomfort)</b>	
I experience pain in the neck at the end of the day with voice use.	71(88.75)
I experience throat pain at the end of the day with voice use.	68(85)
My voice feels sore when I talk more.	65(81.25)
My throat aches with voice use.	66(82.5)
I experience discomfort in my neck with voice use.	64(80)
<b>Factor 3 (Improvement of symptoms with rest)</b>	
My voice feels better after I have rested.	73(91.25)
The effort to produce my voice decreases with rest.	71(88.75)
The hoarseness of my voice gets better with rest	66(82.5)

**Table 2:** Representation of frequencies and percentages

The mean score of tiredness of voice (factor 1) was 20 years. having Pearson correlation of 0.470, the mean score of physical discomfort (factor 2) was 8 years having Pearson correlation of 0.393 and the mean score of improvement of symptoms with rest (factor 3) was 8 years having Pearson correlation of -0.063 (Table 3).

Sr. No.	Years of Experience	Pearson correlation
Tiredness of voice (Factor 1)	20	0.470
Physical discomfort (Factor 2)	8	0.393
Improvement of symptoms with rest (Factor 3)	8	-0.063

**Table 3:** Representation of correlation statistics

## DISCUSSION

In this study, Researcher take experience of minimum 1 year and maximum 5years. Respondents were 80 SLP's who participated in the study using convenient sampling technique. The mean year of experience was  $2.38 \pm 1.49$ . Carrillo-González and Atarà-Piraquive study were based on information gathered from 142 SLPs, and 71.13% of SLPs reported experiencing voice fatigue. SLPs have an average of 2.81 1.76 years of work experience. Experience with a minimum of one month and a maximum of five years is required for this study's enrollment [16]. Timmermans et al., conducted a study that looked at occupational voice users found that people who use their voices frequently, like teachers, had more vocal health issues. With the help of an online survey that included the Vocal Fatigue Index, 640 teachers were polled [17]. The VFI measured significant vocal fatigue in teachers. Meerschman et al., study demonstrated greater rates of vocal health issues like vocal fatigue among occupational voice users and that SLPs also use their voices professionally, we can infer that there are also higher rates of vocal tiredness in SLPs [18]. Physical discomfort had a mean score of 8.30 4.156, while

symptom improvement with rest had a mean score of 7.86 2.814. The average result on the "tiredness of voice" scale was 20.15 7.180 ( $r = 0.470$ ). Thus, the vocal tiredness increases as the vocal problems do. Sliwinska-Kowalska et al., conducted a study to confirm the signs of vocal tiredness in academics in universities [19]. Physical discomfort received a mean score of 4.05, while symptom improvement with rest received a mean score of 7.93. When vocal symptoms were more severe, vocal fatigue was also more severe ( $r = 0.727$ ) when speaking fatigue was present [20]. The SLP's participated in this study has majority of years of experience of 1 and 2 years. Due to unavailability and lack of time and resources, the sample size was not achieved. Quota sampling technique should be used so equal number of participants in each category of year of experience should be selected. This results in more clarity to association of vocal fatigue and years of experience.

## CONCLUSIONS

As the age passes the experience of SLP's increases. It is mostly seen that the SLP's decreases their practice because it is the need of their age and health. Increased experience and age automatically leads towards less vocal fatigue because of less use of voice as their medical practice is reduced.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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## Original Article

## Examination of Blood Urea, State of Reactive Oxygen Species And Antioxidants Associated With Oral Contraceptive Pills Among Female Athletes

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## ARTICLE INFO

**Key Words:**

Blood Urea, Oxidative Stress, Oral Contraceptive Pills, Females Athletes

**How to Cite:**

Zafar Iqbal Butt, M. ., Jamil, M. ., Khan, A. ., Chaudhary, A. ., Ahmad Jan, A. ., Khan, M. ., Selamoglu, Z. ., Canan Alp, E. ., & oman Al Ala Durrani, M. R. (2022). Examination of Blood Urea, State of Reactive Oxygen Species and Antioxidants Associated with Oral Contraceptive Pills Among Female Athletes : Examination of factors associated with Oral Contraceptive Pills among Female Athletes. *Pakistan Journal of Health Sciences*, 3(06), 287-290. <https://doi.org/10.54393/pjhs.v3i06.356>

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Received Date: 18 October, 2022

Acceptance Date: 16th November, 2022

Published Date: 30th November, 2022

## ABSTRACT

Blood urea, reactive oxygen species, and antioxidants are interconnected biochemical parameters. In case of any adverse effects of any agents, it directly affects the body's physiological activities. **Objective:** To examine blood urea, the state of reactive oxygen species and antioxidants associated with oral contraceptive pills (OCP) among female athletes.

**Methods:** Participants of the study were randomly selected as participants of the study. The users of OCP were placed in the Experimental Group (EG), and the nonuser of OCP was put in (CG). Each group was comprised of twenty-five subjects. 5 ml blood was collected from all the subjects. Each subject was marked with a different identification code. The blood urea level was measured through the blood urea nitrogen (BUN) test. The balancing state of reactive oxygen species and antioxidants was measured through FRAP Assay. Results collected through both BUN and FRAP were calculated through the statistical package for social sciences (SPSS, version 26). **Results:** The mean and standard deviation of EG in term of blood urea was 29.23 ±7.89; df was 82, t-score was -.822, P- value was .413. A significant difference in term of FRAP between CG and EG was found, such as the mean and SD of CG were 137.95±.20.87, means and SD of EG was 110.54±.39.22, the t score was 3.23, and the P value was .002. **Conclusions:** Results show that OCP significantly impacts blood urea and causes an imbalance in both reactive oxygen species and antioxidants among users.

## INTRODUCTION

Many females use OCP-containing hormones like estrogen and progesterone for controlling unwilling pregnancy by destroying ovulation, coagulating the cervical mucus and spoiling sperm diffusion [1, 2]. Both estrogen and progesterone are likely hormones produced naturally by the female ovary [3, 4]. Resultant of different factors,

naturally, in the human body, reactive oxygen species as free radicals (ROS / RONS), which, by the transfer of their free, unpaired electron, causes oxidation [5, 6]; thus human body leads to oxidative stress. Oxidative stress is the "Imbalance between reactive oxygen species (ROS) and antioxidants in the body". Antioxidants are essential in

preventing the body from oxidative stress caused by reactive oxygen species. This imbalance leads to tissue damage [7, 8]. In oxidative reactions, organic compounds such as DNA, proteins, carbohydrates and lipids become degraded. The body contains powerful enzymatic and non-enzymatic anti-oxidants, which manage the lethal effects of oxidative stress. As reactive oxygen species generate oxidative stress, so in conditions like inflammation, carcinogenesis, ageing, radiation damage and photo biological reactive oxygen species are involved. This area of research (oxidative stress) provides new perspectives in pathophysiology, toxicology, biochemistry and pharmacology [7]. In a normal person, the level of reactive oxygen, species and antioxidants remain equal. When this balance disturbed, the level of reactive oxygen becomes increased [9, 10]. Living organisms use the oxygen to survive. As oxygen is poisonous to the body, these organisms contain antioxidants to counteract free radicals bent due to biochemical reactions and safeguard the body from the toxic effects of oxygen. Antioxidants are the constituent which foils the oxidation of organic molecules, produced in the body and also taken with food. Considering the above critical analysis of previous studies, it is clear that OCP users may be at risk of different health problems. What is the impact of OCP on the blood urea and antioxidant system? To discover this fact, the researcher intends to conduct a research study under the title "Assessment of Blood Urea and Oxidative Stress Induced by Oral Contraceptive Pills among Females Athletes."

## METHODS

The researcher adopted the below procedures to reach specific findings and conclusions. Female athletes were taken as Participants of the study were randomly selected as participants of the study. The users of OCP were placed in the Experimental Group (EG), and the nonuser of OCP was put in (CG). A random sampling technique is used for selecting sample and thus each group was comprised of twenty-five subjects. 5ml blood was collected from all the issues. Each subject was marked with a different identification code. The ethical and review board of Gomal University, Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan, approved the protocol of this particular research study. The blood urea level was measured through the blood urea nitrogen (BUN) test. The balancing state of reactive oxygen species and antioxidants was measured through the Ferric Reducing Assay Protocol (FRAP Assay). Results collected through both BUN and FRAP were calculated through the statistical package for social sciences (SPSS, version 26.0) and by using analyzed by using mean, standard deviation, frequency and percentage etc., as statistical tools. Mean and Standard Deviation was calculated for quantitative variables and frequency and

percentages for qualitative variables. Independent sample t test was applied to find out the significant difference of blood urea levels among both groups. p value <0.05 was considered as significant. Mean: The mean can be used to represent the typical value and therefore serves as a yardstick for all observations. It is calculated as:

### Mean Formula

$$\text{Mean} = \frac{\text{Sum of All Data Points}}{\text{Number of Data Points}}$$

$$\text{Mean} = \text{Assumed Mean} + \frac{\text{Sum of All Deviations}}{\text{Number of Data points}}$$

Standard Deviation: Standard deviation measures the dispersion of a dataset relative to its mean. It is calculated as the square root of the variance. Standard deviation, in finance, is often used as a measure of the relative riskiness of an asset.

## RESULTS

Table 1 represents the age-wise difference in blood urea mg/dl in both CG and EG. 15 participants were between age 20-25 years, 20 participants were between age 26-30 years and 15 participants were above the age of 31 years.

Age-wise groups	Number
20 -25 years	15
26-30 years	20
31 years and above	15
Total	50

**Table 1:** Showing the age-wise difference regarding Blood Urea mg/dl in both CG and EG

Table 2 shows the mean difference in blood urea mg/dl in CG and EG. The data indicate the same result regarding blood urea in both CG and EG. The mean and standard deviation of CG was 27.66 ± 7.86. The mean and standard deviation of EG was 29.23 ± 7.89, df was 82, t-score was -.822, p-value was 0.413.

Groups Statistics						
Testing Variables	Testing Groups	N	Mean ± SD	Df	T-score	p-Value
Blood Urea mg/dl	CG	25	27.66±7.86	82	-.822	.413
	EG	25	29.23±7.89			

**Table 2:** Showing the mean difference in Blood Urea mg/dl in both CG & EG

Table 3 shows a significant difference between CG and EG in FRAP. The mean and SD of CG were 137.95 ± .20.87, means and SD of EG was 110.54 ± .39.22, the t score was 3.23, and the P value was .002.

Groups Statistics						
Testing Variables	Testing Groups	N	Mean ± SD	Df	T	p-Value
FRAP	CG	25	137.95±.20.87	82	3.23	.002
	EG	25	110.54±.39.22			

**Table 3:** Showing the mean difference in FRAP in both CG and EG

## DISCUSSION

The result of the study reveals that there is no significant

difference between age-wise three groups in Blood Urea mg/dl because ( $F = .298, P > 0.05$ ). The mean scores of the three age-wise groups were the same. So, it is found that there is no effect of age on Blood Urea mg/dl. Similarly, is no significant difference between the blood Urea of both CG and EG. Blood urea such as the mean and standard deviation of CG was  $27.66 \pm 7.86$ , The mean and standard deviation of EG was  $29.23 \pm 7.89$ , df was 82, t-score was  $-.822$ , P- Value was  $.413$ . The same finding is drawn by [11, 12], showing that OCP has no effects on blood urea. Opposing the result of the current, the findings revealed by the study conducted [13] and demonstrated that plasma glucose and urea concentrations were unaffected by the menstrual phase or either OCP; likewise, no significant effect was found among OCP users, and thus the finding of the study reveals that OCP is safe and having side effects in term of biochemical parameters of the body [14]. The study shows a significant difference between CG and EG regarding FRAP. In line with this emerging finding, the survey conducted by [15-17] concluded that long-term use of oral contraceptives causes abnormalities in the liver. In the group of 42 women of an average age of 32 years using oral contraceptives. These women were matched with control women who were not using any contraceptives. It was indicated that there was a significant difference between cases and control movement because women taking oral contraceptives are associated with liver abnormalities, such as liver cell adenomas and hemorrhage into the tumour. Thus, it was concluded that prolonged use of oral contraceptives causes abnormalities in the liver. Finding of the study conducted by [18-20] support the present study by finding out that oxidative stress is caused by oral contraceptives (OC), which could be disadvantageous to physical activity and raise cardiovascular risk (as thromboembolism).

## CONCLUSIONS

Based on the analysis, the researcher arrived at the conclusion that there is no significant difference between the blood urea of the control and subjects. It means that OCP has no effect on blood urea. In addition, the researcher also draws the conclusion that OCP has a significant impact on the antioxidant system and cause oxidative stress among its user.

## Conflicts of Interest

The authors declare no conflict of interest.

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

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## Original Article

## Comparison of Pragmatic Skills in Hearing Aid Users vs Normal Hearing Children

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## ARTICLE INFO

## Key Words:

Normal Hearing, Hearing Aid Users, Pragmatic Skills

## How to Cite:

 Mustafa, Z. ., Noreen, H. ., Yaqoob, S. ., Hussain, B. ., Ehsaan, F. ., Asfara Badar, S. ., Azzam Khan, M. ., & Anwar Faridi, T. (2022). Comparison of Pragmatic Skills in Hearing Aid Users' Vs Normal Hearing Children: Pragmatic Skills in Hearing Aid Users. *Pakistan Journal of Health Sciences*, 3(06). <https://doi.org/10.54393/pjhs.v3i06.316>

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 Received Date: 31<sup>st</sup> October, 2022

 Acceptance Date: 23<sup>rd</sup> November, 2022

 Published Date: 30<sup>th</sup> November, 2022

## ABSTRACT

Hearing impairment (HI) is most typical birth defect. Pragmatics abilities usually developed in the first eight years of life in children. **Objectives:** To compare the pragmatic abilities of both children who are hearing aid users and normal hearing to assess pragmatics based on instrumental, regulatory, personal, interactional, need explanations, knowledge sharing and explanation. **Methods:** It was a comparative cross-sectional survey. Total sample of 54 children were included. 27 children were hearing aid users and 27 with the normal hearing. Purposive sampling technique was used in this study. All individuals with normal hearing and those who use hearing aid were included with the age range of 3 to 7 years. Social communication pragmatics checklist was used for collecting the data. **Results:** Results showed that children with normal hearing had overall better pragmatic abilities as contrast to the children who use hearing aid. The mean pragmatic skill total score in normal hearing children was  $154.40 \pm 18.9$  and Hearing aid user children was  $115.07 \pm 27.98$ . There was significant difference in the mean pragmatic skill total score among both groups ( $P$ -value  $< 0.05$ ). **Conclusions:** It was concluded that communication-pragmatic abilities are good in children with normal hearing as compared to children who are hearing aid users.

## INTRODUCTION

The most typical birth defect (BD) is hearing impairment. Because there is insufficient auditory information, hearing impairment has a negative impact on the development of early communication skills. Because of this, children with extreme HI are far more likely to experience serious delays in speech and language development, which may affect their ability to communicate, grow cognitively, and develop socially [1, 2]. When using oral-aural programmes, children demonstrate strong spoken language abilities and have fewer communication breakdowns than when using complete communication programmes [3]. Pragmatics

abilities are often developed in the first eight years of life with a variety of peers through experience in regular discussions. By engaging in these reciprocal links, infants learn to distinguish between sender and receiver as well as a receiver of details [4]. Children with hearing loss follow more instructions and ask fewer questions than children with normal hearing, are barely able to keep the conversation on-topic, and display fewer distinct pragmatic conversational speech patterns, according to studies and knowledge about the development of pragmatics abilities in hearing loss children [5]. In a study,



subjects who reported feeling enervated generally received lower marks for all of the microstructure elements of stories. However, the findings showed that there was little to no difference between different groups in the macrostructure of stories. It was also discovered that the students performed equally well on spoken and written accounts. Finally, a factor analysis revealed that the congregation, gender, and age of listening may affect the outcome of various communications [6, 7]. After discernibility is put to the test by background noise and hearing loss, visual information from communicators increases speech fluency for audience members. Only a small amount of information is known on how to actively process listening while maintaining knowledge of visual commands from various talkers in contexts with multiple talkers [8]. Early-implanted children could develop greater social communication skills similar to peers with normal hearing, and it could also plan for age one year after device activation. Grammatical improvements and social communication skills are indisputable correlates, but the current study design makes it impossible to predict the direction of this association. Children who had some preoperative residual hearing that was better showed more pragmatic ability [9]. The "hypothesis of brain" is one psychological domain in which hearing children are known to outperform hard of hearing children. Early conversational experiences that were ruined and the difficulty of conversing about hypothetical mental states are seen as possible promoters of this weakness [10]. The group's decision on the three requests' procedures varied significantly as well. The groups revealed similar amounts of mature enough correct expressive language, but they appeared to differ in how it was used in everyday situations. It was advised that projects' methodological preparation should take the speaker's speech understandability into account and be tailored to their particular demands [11].

## METHODS

This comparative cross-sectional study was conducted for nine months in the Audiology center Lahore and district headquarters hospital Okara. Social communication checklist (the pragmatic checklist) was used to assess the pragmatic abilities of children using hearing aids and typical hearing. All Performa were filled by Speech Language Pathologists. Sample size was 54 (27 in each group). Using the level of mastery by age 7 years among normal (100%) vs hearing aid users (69%) the sample size was calculated using formula for two independent proportions. Proportion in group 1 was 1 and proportion in group 2 was 0.69. So, the (r) was 1 and calculated sample size was 27 in each group. Purposive sampling technique was used in the current study. Children who had normal hearing and who were hearing impaired, both were

included in the study. Those children with hearing impairment who were wearing hearing amplification devices from at least 3 years and fall in age range of 3 to 7 years were included in the study. Post lingual hearing aid user and children with any physical and psychological disorder co morbid with hearing loss were excluded from this study. Measuring tool was social communication checklist. The pragmatics checklist which is a standardized tool and Cronbach's alpha value is 0.80. Total 45 pragmatic items were included. There are six categories in the checklist which defines the pragmatic skills. (1) instrumental, (2) regulatory, (3) personal, (4) interactional, (5) wants explanation, (6) shares knowledge [12].

## RESULTS

The data analytic strategies involved demographic information and mean difference and standard error in pragmatic skills of children with normal hearing and hearing aid users. The two sections comprise of the demographic section and the comparative differences between normal hearing and non-hearing aid users. The final table shows the cumulative score of the pragmatic ability of both types of individuals. The demographic information of the hearing impaired and normal hearing children, the gender, socioeconomic status and age of the children. The subjects were divided equally between normal hearing and hearing aid users, majority of the subjects were male and the socioeconomic status cluster mainly comprises of lower income individuals. The children were mostly between the ages of 5-6 years. The gender of the child when paired with hearing status we can see males with hearing aid show more response and normal hearing females show more response. The socio-economic status with normal hearing were more in number and the middle class catered more towards hearing aid users, in the upper class more children were from the normal hearing category. When compared with family type the joint family system children who were hearing aid users had better pragmatic abilities. The parental education when compared with hearing status of child shows that the illiterate families had better pragmatic abilities in hearing children and the educated people had majority development in the hearing aid children, whereas the highly educated parents of children also had better skills for normal hearing individuals (Table 1).

Variable	Child Hearing Status		Total
	Normal Hearing	Hearing Aid User	
<b>Gender</b>			
Male	13(48.1%)	18(66.7%)	31(57.4%)
Female	14(51.9%)	9(33.3%)	23(42.6)
<b>Socioeconomic Status</b>			
Lower Class	10(37.0%)	9(33.3%)	19(35.2%)
Middle Class	12(44.4%)	15(56.6)	27(50.0%)
Upper Class	5(18.5%)	3(11.1%)	8(14.8%)

Family type			
Joint	15(55.6%)	18(66.7%)	33(61.1%)
Nuclear	12(44.4%)	9(33.3%)	21(38.9%)
Parents Education			
Illiterate	10(37.0%)	4(14.8%)	14(25.9%)
Educate	9(33.3%)	18(66.7%)	27(50.0%)
dhightly Educated	8(29.6%)	5(1.5%)	13(24.1%)
Age of Child			
3-4	9(33.3%)	11(40.7%)	20(37.0%)
5-6	9(33.3%)	12(44.4%)	21(38.9%)
Up-to 7	9(33.3%)	4(14.8%)	13(24.1%)

**Table 1:** Demographic information

The mean pragmatic skill total score in Normal Hearing children was  $154.40 \pm 18.9$  and Hearing aid user children was  $115.07 \pm 27.98$ . there was significant difference in the mean pragmatic skill total score among both groups (P-value  $< 0.05$ )(Table 2).

	Child Hearing Status	Mean $\pm$ SD	P-value
Pragmatic Skill Total Score	Normal Hearing	$154.4074 \pm 18.94376$	0.000
	Hearing Aid User	$115.0741 \pm 18.94376$	

**Table 2:** Mean difference in pragmatic skill score among hearing aid and normal hearing children

## DISCUSSION

This study aimed to compare the pragmatic ability of the children who wore the hearing aids due to hearing deficit and children who have normal hearing, in order to spotlight on social aspects and language use. The sum of sample was 54 children, age ranges from 3 to 7 years of age and 27 were normal hearing and 27 were hearing aid users. Children for this study were chosen by using non probability purposive sampling technique. DeLuzio and Luigi examined peer interactions between children with and without hearing loss in 2011. The ability of children with hearing loss (SPHL) to manage conversational exchanges with peers in social situations. Close friends of preschoolers with SPHL avoided social interactions with them. Age-appropriate linguistic skills were no guarantee of successful friendships. Comprehensive preschool initiatives can think about providing homeroom-wide social skills training to improve cooperation opportunities [13]. According to 2015 study by Hoffman *et al.*, the focus of this investigation was on verbal and the social development of young children with hearing loss and their hearing companions. Relapse findings revealed that linguistic age and hearing ability predicted social skill in two groups after controlling for mother training and remuneration. Connections were also seen in the age of amplification, the age of enhancement, and the total social skill testing in children with hearing loss. The results corroborated the theory that linguistic deficiencies may have negative effects on early hard of hearing children's progress in social abilities [14]. Nicholas stated that the research shows a cross-sectional

investigation of social communication skills in children with substantial hearing loss and children with normal hearing. A rather unique example of open work advancement in children with hearing impairment and normal hearing was suggested by Nicholas. Additionally, the success of traditional linguistic achievements was strongly linked to the use of language in social designs [15]. In order to build an appropriate intercession database and prepare for the effects of early pragmatic language expertise issues on later scholastic and social capacities, the main goal of this study was to examine the pragmatic linguistic capacity of Arbi-talking children with sensorineural hearing loss. The findings of this investigation showed that children with HL had significantly worse pragmatic abilities than children with NH. The amount of HL, discourse separation capacity, and the concept of hearable suffering all showed notable connections with the realistic elements. Shoeib *et al.*, found the importance of pragmatic skills for additional socially instructive and academic vocations as well as the increased powerlessness to pragmatic impedance in this category of children should be taken into account in their rehabilitation plan [16]. This investigation looked at how weak and typical talking kids used language in dialogue. Twenty individuals who were language-impaired (LI) in stages III and IV formed the trial group. One benchmark group was made up of 20 typically speaking, more normal young children (NSY), who were compared to MLU's language-impaired individuals. The other comparison group was made up of 20 more seasoned average normal speaking children (NSO) who were compared to the test group according to chronological age. More than the LI or NSY, the NSO used describing and recognizing conversation acts. The LI employed noting more frequently than the NSO did. The NSY used mentioning an action more frequently than the NSO. The findings suggest that language-weak persons can use a variety of discourse [17]. In this study, disconnected word acknowledgment explorations in cued speech for French in both normal-hearing and the hard of hearing subjects were introduced. Cued speech recognition for augmentative communication in normal-hearing and hearing-disabled subjects appeared in this investigation's results. Communication was achieved at a rate of 92.0% for those with hearing loss and 95.2% for those with normal hearing thanks to the cues [18]. In tasks involving hearable verbal memory of sounds (reverse), visual-verbal memory of letters, and visual-verbal memory of pictures, the hearing-impaired children performed on par with typically hearing children. Nevertheless, they showed lesser levels of understanding appreciation execution ( $p < 0.001$ ). Additionally, there was little evidence of a link between

working memory and reading comprehension. Rezaei et al., study shown that children with hearing loss have a significant impairment in their capacity to read comprehension. Inability to understand language content and jargon may be the main cause of these kids' weak reading comprehension. Working memory is most definitely not a reliable predictor of understanding comprehension in children with hearing impairment [19]. The purpose of this study was to compare the outcomes of children with severe to profound hearing loss who learned language through cochlear inserts to those of a group of candidates with moderately serious to severe hearing loss who use listening devices on a range of language (discourse language, phonology, and cognition). 40 children with corresponding sensorineural hearing loss, aged 6 to 18, were enrolled in this study. Twenty children had moderately severe or acute hearing loss and wore hearing aids, while 20 had severe to profound hearing loss and wore cochlear implants. Discourse acknowledgment Tests and standardized ratios of discourse production, language, phonology, and insight were used to survey students' academic and communication skills. Discourse language, phonology/education, and discernment were considered in the current study. This study suggests that, when compared to portable amplifiers, using a cochlear implant as an assistive device improves the development of language abilities (discourse language, phonology, and discernment)[20].

## CONCLUSIONS

Summarizing, the major outcome of this study was the comparison of pragmatics, which includes instrumental, personal, regulatory, interactional, shares knowledge, wants explanations and concluded that children having the normal hearing status showed the good pragmatic abilities compared to hearing impaired children.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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