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Cook NR, Rosner BA, Hankinson SE, Colditz GA. Mammographic screening and risk factors for breast cancer. American Journal of Epidemiology. 2009 Dec;170(11):1422-32. doi: 10.1093/aje/kwp304.

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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.

ACKNOWLEDGEMENT

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PAKISTAN JOURNAL OF HEALTH SCIENCES
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Editorial

Infection and Immunity

Fridoon Jawad Ahmad[1*]

[1]University of Health Sciences, Lahore, Pakistan
dr.fridoon@gmail.com

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Understanding the interactions between hosts and pathogens requires in-depth knowledge of extremely complex biological systems. Pathogen flags (PAMPs) or virulence factors interact with or stimulate the host receivers, which include numerous pattern recognition receptors, in a simplified pathway. In an environment with hundreds of spatiotemporal and epidemiological variables, these interactions either occur or do not. Additionally, the interactions become part of a more dynamic and complex system due to the coevolution of the host and pathogen. Based on our understanding of the conflict or coexistence between the host and pathogens, health or disease status could be changed in a systematic manner. However, it depends on whether we want to alter our focus on deterring infections or favour a homeostatic equilibrium in response to stimuli. What we can learn from the immune organ system is that balance is the secret to life. The sense of interaction could be changed from "fighting" to "fitting" based on the novel insight. Despite the conventional wisdom that infections should be treated with drugs or vaccines, coexistence with less harm or energy use would be ideal and cost-effective. Based on the traits that affect our fitness, natural selection drives the evolution of our pattern of survival and reproduction. Additionally, pathogens do not always evolve to improve or worsen virulence beyond the specifics of the molecular or cellular basis.

The coevolution of the host and pathogen generates a unique "trade of" and/or "balance" with a notable decrease in pathogenicity and host immune responses, each in their own way. It is possible to control the spread of disease or change the environment to a norm, standard, or desired status quo in a number of ways, including management and rearing practices, immunisation, and choice of enhanced disease resistance. While experiments and field trials can involve costly and immoral processes, perfect decision-making requires intuition. Simulations and mathematical modelling have evolved into crucial experimental and computational tools for dynamic and complex frameworks. It is interesting to note that the immune system offers invaluable models for these kinds of strategies because of the disciplines and principles guiding its behaviours and responses. Researchers will be able to the transmission and management of newly or reemerging infectious diseases with the use of mathematical modelling, which also provided us with profound insight into infection and immunity. In veterinary science, mathematical models made notions like "herd immunity" clear for vaccination plans.

However, picking a model for host-pathogen interactions is difficult and requires some thought. The goodness of fit measures how well the host immunity "fits" with the pathogens in its environment and serves as a parameter for model selection. In this situation, population genetics-related dissipation or "fitness flux" affects mathematical models. In light of this, the model should include variables related to immunogenetics and pathogenic coevolution.

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Guest Editorial

Membranes and Transport Mechanisms

Tamseela Mumtaz[1*]

[1]GC Women University Faisalabad, Faisalabad, Pakistan
gr8zoologist@gmail.com

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Cellular life depends on the movement of membrane ions. For cells to continue functioning as they go through their life cycle, there must be a tremendous amount of exchange. Cell membranes are active structures rather than merely passive barriers separating cells from their surroundings. Cell membranes are known to be selectively permeable, allowing some chemicals to pass through while preventing others from doing so. Therefore, all cellular exchange activities can have active participation from cell membranes. Through the membrane interface, elements needed for cellular existence, communication among cells, and interaction between cells and their environment are taken in. Additionally, cells have the ability to direct and influence input and export processes, as well as moderate the subsequent signal response. Effective drug transportation across cellular membranes is essential for all treatment procedures. The majority of medications used in cancer therapy require carrier proteins for their transmembrane transport, even though hydrophobic small molecules can enter the cell membrane through straightforward diffusion. As a result, many scientists concentrate on creating novel strategies to improve drug delivery and uptake into desired cells. A live cell's plasma membrane serves as its outer wall. Although it acts as a barrier, it also permits transport between the cell and its surroundings.

While the hydrophilic head groups are in contact with the surrounding water, the bilayer's hydrophobic interior, which is made up of fatty acid chains, renders the membrane impermeable to water-soluble compounds. To reduce the accessibility of hydrophobic fatty acid chains, phospholipids can spontaneously form stable bilayers in an aqueous environment due to their amphipathic nature. As lipids and proteins positioned in the plasma membrane can rotate or diffuse laterally and are distributed asymmetrically in the two leaflets, membranes are extremely dynamic structures. In addition to glycolipids, the outer leaflet of the plasma membrane mostly consists of the phospholipids phosphatidylcholine and sphingomyelin. Phosphatidylethanolamine, phosphatidylserine, and phosphatidylinositol are the three main substances that make up the inner leaflet.

Additionally, both leaflets contain cholesterol, which affects the fluidity of the membrane. Lipid rafts are particular domains abundant in sphingolipids and cholesterol. The plasma membrane's basic role as a selectively permeable wall dividing the inside from the outside of the cell is determined by the structure of the phospholipid bilayer. Membrane proteins are essential for guaranteeing the selective translocation of molecules across the membrane as well as the regulation of cellular connections. They can function as energy converters, ion channels, pumps, receptors, or enzymes. The maintenance of the osmotic pressure and cellular pH, as well as the regulation of drug uptake mechanisms, account for the regulation of fundamental cellular activities.

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Original Article

Impact of COVID-19 on Employment in Tertiary Care Hospital of Karachi

Syeda Rida Baqir[1*], Yumna Ilyas[2], Komal Jamil[1], Shafaq Aslam[3] and Bismah Khan[2]

[1]Bhaira University Health Sciences, Karachi, Pakistan
[2]Department of Physical Therapy, Sohail University, Karachi, Pakistan
[3]Department of Rehabilitation Sciences, Dr. Ziauddin Hospital, Karachi, Pakistan

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***Corresponding Author:**

Syeda Rida Baqir
Bhaira University Health Sciences, Karachi, Pakistan.
dr_rida91@yahoo.com

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ABSTRACT

A public health dispute regarding the pandemic disease COVID-19 has wrapped up the entire world. Based on statistics Pakistan lies as a low and middle-income country throughout the world and out of 189 countries it lies in the 152nd rank with an index value of 0.560 on the Health development scale. **Objective:** To evaluate the unemployment among health care workers working in rehabilitation departments in tertiary care hospitals. **Methods:** This was a cross-sectional survey of sample size 212 conducted on healthcare workers working in Ziauddin hospital department of rehabilitation sciences, Karachi, the research study is explanatory, whereas the method is quantitative. The initial research was done by gathering the literature linked to healthcare workers and being examined via validated questionnaires through emails and various statistical tools used to analyze the complete data. **Results:** The results showed that the mean age was found to be 28.75 ± 5.8. Male participants were found to be 20(9.4%) and females were 192(90.6%). Most of the participants were graduates 128(60.4%) followed by post-graduate 76(35.8%). There were 128(60.4%) participants who were single. Employment status was asked most of the respondents found out of work and looking for work there were 16 respondents in Taking care of the home and family and 80 unemployed and seeking a job with a significant P-value of <0.001. **Conclusion:** The conclusion of the study showed there is a significant effect of the COVID-19 pandemic disease on the employment status of workers of healthcare in tertiary care hospitals in Karachi.

INTRODUCTION

The significant impact on the health and economic status of Pakistan occur due to the outbreak of the pandemic disease in recent decades named COVID-19. Over 113 million cases have been reported globally among which the United States reported the highest number of cases that are up to a 28 million and the highest number of deaths as well. Apart from that, India, Brazil, Russia, and United Kingdom are among the countries where the effects of this virus have taken a toll on. Pakistan is the 30th most affected country, according to the World Health Organization (WHO). Before spreading the disease throughout the World the city named Wuhan, China has reported the first case of COVID-19 in December 2019. It was quickly identified as a novel beta-corona virus by March 2020, COVID-19 was pronounced as a pandemic by the WHO [1]. COVID-19 occurrence is due to the cause of SARS CoV-2 (Severe Acute Respiratory Syndrome). For correct management of COVID patients, accuracy is required in diagnosis so for this purpose CT (Chest Computer Tomography) can play a vital role in the diagnosis of a patient because there is no proven scientific treatment available up till now for this virus. Chest CT scan can reveal abnormal clinical features such as pneumonia, ARDS, anemia, and cardiac injury, which can cause death as well. A major noticeable symptom in the subpleural area of both lungs is the finding of multiple peripheral ground-glass opacities which can lead to an increase in the inflammatory responses of the immune system. The route of transmission of COVID-19 is through direct contact and

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droplets. It severely affects the respiratory system in older adults and those with chronic obstructive pulmonary disease and other respiratory conditions, cardiac diseases, kidney diseases, overweight, and diabetes are at a higher risk to develop severe coronavirus with more serious complications, requiring hospitalization. Recently there is a variation in the casualty rate of the affected population on an average of 2.3% of elderly people more than 80 years are at high risk as compared to the initial estimation that was based on severely ill patients' susceptibility [2, 3]. During the period of incubation both symptomatic and asymptomatic carriers can transmit the disease because it is assumed to be the highest infectious and communicable disease [4]. Due to the deficit of healthcare facilities and instability of the financial status of the Eastern Region recently WHO has been frightened and reported an increase in COVID-19 cases. As the foundation of health structure in Pakistan is weak so recently the country formulates policies and implemented strategies to reinforce surveillance, as thermal screenings should be mandatory at all entries and data collection, which have been done through a contact tracing mechanism [5]. From the 1st wave of coronavirus in which the country's economic rate was affected taking the lesson from the three months lockdown that was inflicted, there a decision was taken by the government to impose a smart lockdown instead of a complete lockdown because of the rise in COVID-19 cases. In the least developed and developing countries, the social and financial loss of COVID-19 has been seen at a great margin. There is a fall in GDP and income concerning employment and which results in a rise in the level of poverty, malnutrition, and lack of resources, etc. Health care facilities and hospital employees have also suffered during this time. The pandemic-induced insecurity is now pushing these health care employees to the edge due to the prevailing uncertainty in employment in Pakistan [6]. There is a multiple-level impact of COVID-19 in tertiary care hospitals. At the health department level, OPD (Out-Patient Departments) were closed, and an increase in emergency or COVID-19 cases occur which causes a decrease in the revenue of the hospital. The shortage of important medications occurs due to the increase in demand and decrease in the supply of medications [7]. The diversion of help from Healthcare Providers occur because they are also at a high risk of acquiring the pandemic disease as they are more exposed to the virus as compared to others. A country like Pakistan has a limited number of resources and professionals seeing to the lack of capacity to serve patients in non-emergency conditions [8]. Due to the postponement of elective or planned work the financial loss occurs more than 55% and also there is a decrease in musculoskeletal trauma elective procedures. There is also a reduction in return on investment of inpatient care during the pandemic period. Inpatient hospital stay was also minimized during the COVID-19 period. Personal protective equipment procurement cost was an additional expense during the pandemic condition by the management of the hospital [9]. Where there had been a massive influx of COVID-19 patients in the isolations wards so much so that there has been no room to facilitate more, there we see on the other hand the shortage of medical staff and appropriate gear required to have on when coming in contact with these patients. These health care professionals have been working extra hours during this time of crisis. A huge number of hospital employees contacted the virus and the hospital has no substitutes on their behalf [10]. A large number of lower-level employees were laid off as well because hospitals were not able to afford them. There hasn't been any new induction of health care staff, which ultimately led to a decline in the employment rate. The implication of mental health characteristics is also an important thing for consideration [11]. In Pakistan occurrence of coronavirus was in February 2020 and the first national lockdown due to pandemic disease was started in March 2020, currently, 0.4 million cases have been recorded, semi-lockdown throughout the nation due to 2nd wave was started in November 2020, In highly populated country Pakistan, The scarcity of doctors and other health resources occur during the COVID-19 period [12]. Rise in COVID-19 positive cases are also due to the geographical area of Pakistan, and there is a requirement of high consideration, strategic planning, and action with evaluation. National Action Plan for Preparedness and Response to Corona Virus Disease plan is offered by the Ministry of National Health Services, Regulation and Coordination of Pakistan on 12th February. During COVID-19 period new inventions of Hospitals, Corona wards in hospitals, quarantine centers for COVID-19 patients, facilities for disease testing, preventive measures, and community awareness programs organized by the government are underscored in this study [13]. The study was conducted to evaluate the market rate of unemployment among health care workers working in rehabilitation departments in tertiary care hospitals during the pandemic and what measures need to be taken by the relevant authorities to remedy them.

METHODS

This cross-sectional study was explanatory, whereas method was quantitative, in which nonprobability convenience sampling is used while the survey research is carried out by the health care providers working in Ziauddin hospital Karachi. The sample size of the research is 212 Health care workers working in the rehabilitation

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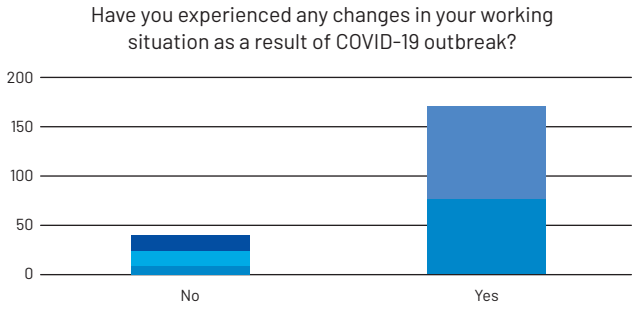
department (Physiotherapists, Physio Aide Occupational Therapists, Occupational Aide, and Speech Therapists with assistance). Both females and males work in Ziauddin Hospital in Karachi, aged between 20 to 65 years. All married and single respondents were included. The initial research is started by gathering the literature linked to healthcare workers and is examined via a survey questionnaire various statistical tools was used to analyze the complete data. Data were collected from both primary and secondary sources, the questionnaire is used as a primary source of data collection, whereas the secondary data source of the research or articles, journals, and citation of related articles. A validated questionnaire designed by the International Labor Organization was used, to perform multiple analyses. The questionnaire was distributed through email to the list of 350 clinical Healthcare Worconsistede hospitals. An initial email was sent on 2 May with a reminder on 5 May. Responses were recorded from 2 May to 8 May 2021, The final survey questionnaire consisted of 14 questions with two sections (demographic information and employment status). There are two types of analysis used in this study, descriptive, in which demographic information is used in tabular form and inferential, in which statistical tools are used to understand the impact of COVID-19 on employment i.e. Recruitment and selection, pay system, job reliability, degree of satisfaction, etc. SPSS version 23.0 was used to analyze the quantitative data.

RESULTS

A total of 212 participants were included in this study. The mean age was found to be 28.75 ± 5.8. Male participants were found to be 20(9.4%) and females were 192(90.6%). Most of the participants were graduates 128(60.4%) followed by post-graduate 76(35.8%). There were 128(60.4%) participants who were single. Employment status was asked by most of the participants 96(45.3%) found out of work and looking for work. Employed for wages were 84(39.6%). 76 participants experienced any changes in their working situation as a result of the COVID-19 outbreak and were employed of wages. and out of work looking for work was 96 participants. When asked about what is the main reason why you had to stop or close your account activity or family business. 20 employed for wages and 32 out of work and looking for work replied government ordered closure. Insecurity and fear of illness were found in 12 employed for wages and 32 out of work and looking for work category with a significant P-value of <0.001. When asked about what is the main reason you had to stop working or lost your paid job there were 24 employed of wages replied that order was you had to quit yourself similarly 24 replied seasonal, temporary or casual job end and 30 replied that told to wait until called back with significant P-value of <0.001. When asked about, "Do you expect to return to the same job once the situation was over?". There was 36 employee for wages who already returned to their job whereas 16 were unsure about their job with a significant P-value of <0.001. When asked about as a result of the COVID-19 outbreak, "Did you earn about the same income as usual 36 employed for wages?", reply was "yes", whereas 16 participants out of work and looking for work replied, "yes" with a significant P-value of <0.001 When asked about, "What measures did you take to compensate for the loss of income you faced?", there were 32 respondents employed for wages and 32 from out of work and looking for work who replied that, "they sold their assets", with a significant P-value of <0.001 When asking about which of the following describes as what you are mainly doing at present? Most of the respondents found out of work and looking for work there were 16 respondents Taking care of the home and family and 80 were unemployed and seeking jobs with a significant P-value of <0.001 as shown in Figure 1.

Mean Age	**28.75 ± 5.8**
Gender	
	Frequency; n=212 (%)
Female	192 (90.6%)
Male	20 (9.4%)
Education	
Graduate	128 (60.4%)
Ph.D. or equivalent	8 (3.8%)
Postgraduate	76 (35.8%)
Marital Status	
Married	84 (39.6%)
Single	128 (60.4%)
Employment Status	
Employed for wages	84 (39.6%)
Out of work and looking for work	96 (45.3%)
Self-employed	16 (7.5%)
Unemployed and not seeking a job	16 (7.5%)

Table 1: Frequency and Percentage of participants of the study.



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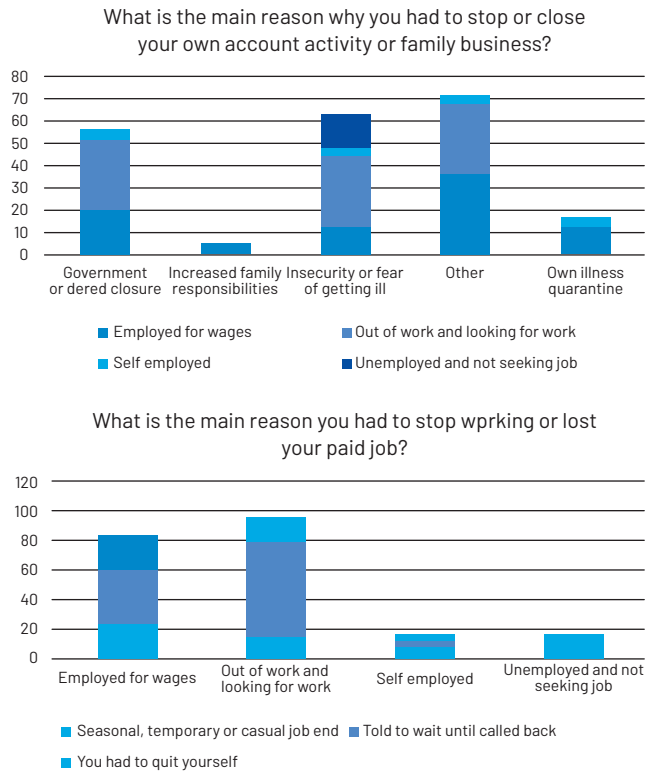
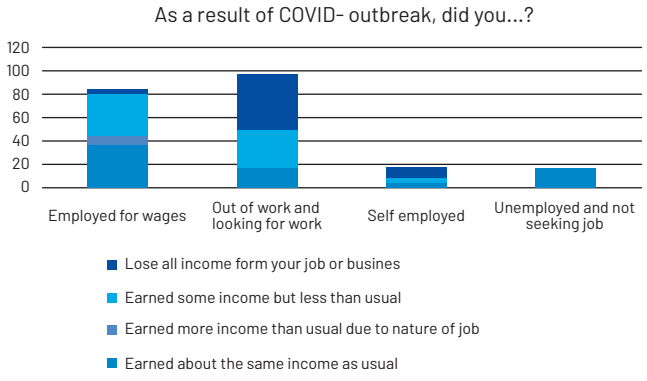


Figure 1: Graphical illustration of participant data.



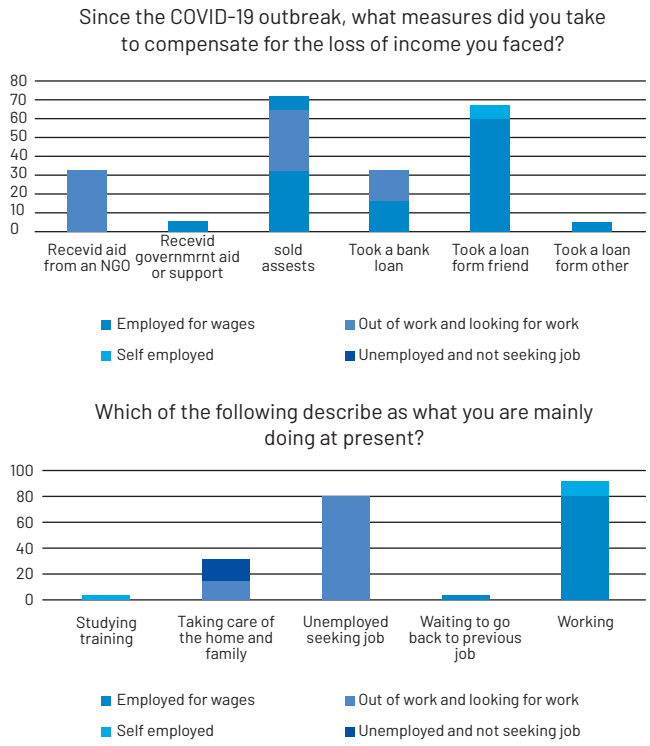


Figure 2: Participant response on various queries asked.

DISCUSSION

Throughout the world, COVID-19 is proved to be the highest stake in the healthcare system. To control the further transmission of pandemic disease WHO gave SPRP (Strategic Preparedness and Response Plan) in the beginning. For caring and treatment of patients healthcare workers of all professions are available in every country [14]. Due to consistent contact of healthcare workers with infected patients, their occupational health is also at risk. In one of the studies, it is documented that delayed or misdiagnosis, poor control practice of this communicable disease due to lack of knowledge among healthcare workers. There should be in priority to prevent communicable diseases in hospitals because several healthcare workers have already been infected [15]. According to A. Waris, Atta Asmat, A. Baset in 2020, the present situation of our country is unsatisfactory as Pakistan is an overpopulated country requiring medical facilitation. And so, our economic position is not good in comparison to other countries like China, the USA, the UK, and Russia to battle with the occurrence of COVID-19 [13]. Medical facilities and supplies in tertiary care hospital is depleting. If these facilities are adequate, it shall not be an issue to control the pandemic. Similarly, in a recent study conducted in 2020 by Muhammad Atif and Irum Malik, we see that although with a low death rate, the spread of COVID-19 among the people is swift, keeping in mind the vulnerable health care system and the lack of ample

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supplies that we are facing due to which we see an increase in the number of cases thus leading to increased morbidity and mortality. This situation can be well controlled by staying at home, social distancing, and the use of precautionary measures like masks and sanitizers. Violation of SOPs can lead to an increase in the number of cases. Furthermore, in a study conducted by Atiqa Khalid and Sana Ali in 2020, we have seen that medical staff should be given appropriate training and protective gear by the government. Atiqa Khalid and Sana Ali highlighted the Challenges faced by HCWs due to the pandemic in 2020 where they implied that initially, Pakistan lacked standard operating facilities which have now been overcome to quite some extent due to which there has been a difference seen in the current scenario and hence the best way to overcome it is by providing healthcare facilities and employment opportunities to the healthcare staff in these times [16]. In our study it is proved that there is a negative effect of COVID-19 on employment of healthcare professionals due to the lockdown situation most HCW lose their jobs due to financial loss and low productivity of institution, and they have to take leave from a paid job due to government order of lockdown and quarantine due to COVID-19 illness and most of the organizations follow downsizing strategy to reduce the capital of an organization and increase the return on investment [17, 18]. As the previous study showed Spain, the UK, and Italy are highly affected by this pandemic disease that causes a worse effect on their health and employment status because of the closure of their organizations a huge level of the financial crisis is seen in these countries because of unemployment, loss of jobs. According to one of the study, COVID-19 not only cause effects on the labor market but also cause the transformation of services into telework that can reduce the contagion effect of pandemic disease and preservation of health and finance as well [19]. According to the current situation most affected province of Pakistan is Sindh in which 427,037 cases confirmed reported at present and still, a lockdown is continued by the government to control the health status of the province [20]. To overcome the economic status of Pakistan formation of a new economic structure is required that can cause a rise in operating margin and demand within the country which unfortunately fall due to the COVID-19 virus from the previous year. Now the vision of Pakistan in the long term is to control the severe effects of this pandemic disease on health and economic status and this can be overcome by applying some alternative strategies through health regulation and authorities of Pakistan.

CONCLUSIONS

According to the results of our study, it is shown that due to pandemic disease employment status of healthcare workers in the hospital is seriously affected and needs improvement to overcome the current situation with good strategic management by the competent authorities.

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Original Article

Association of Obese and Morbidly Obese Status with Hypoalbuminemia in Adults Without Liver and Kidney Disease

Muhammad Maqsood[1*], Husna Iram[2], Sundus Mariyam Haroon[1], Sadia Salman[1], Amanullah Bhalli[1] and Sadaf Iqbal[1]

[1]Department of Internal Medicine, Jinnah Allama Iqbal Institute of Diabetes and Endocrinology, Jinnah Hospital, Lahore, Pakistan
[2]Department of Medicine Children Hospital Lahore, Pakistan

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***Corresponding Author:**

Muhammad Maqsood
Department of Internal Medicine and Department of Jinnah Allama Iqbal Institute of Diabetes and Endocrinology, Jinnah Hospital, Lahore, Pakistan
drmmaqsood@gmail.com

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ABSTRACT

Obesity is an excessive accumulation of fat in the body and is measured in terms of increased body mass index. Its prevalence is increasing in all age groups and is now considered to be a global epidemic. Albumin is the most abundant plasma protein synthesized in the liver and is customarily utilised to detect malnourishment and severe starvation. It is one of the poor prognostic factors in medical, surgical, and critically ill patients. **Objective:** To identify the relationship between obesity and morbid obesity and hypoalbuminemia in adults in Pakistan with no signs of liver or kidney disease. **Methods:** Jinnah Allama Iqbal Institute of Diabetes and Endocrinology (JAIDE), Jinnah Hospital Lahore Pakistan, was chosen for the completion of this cross-sectional study with a time frame of October 2019 to April 2020. 90 patients, ranging between ages of 18 and 70 years, without liver and kidney diseases, were recruited and were divided into three categories, healthy control, obese, and morbidly obese on the basis of BMI. Venous blood samples for albumin were taken. **Results:** The percentage of hypoalbuminemia was 10.0% in healthy controls, 40.0% in the obese group, and 46.7% in morbidly obese. Hypoalbuminemia rate was significantly higher in obese and morbidly obese groups (p-value 0.005) as compared to healthy controls, independent of age, sex, and diabetes. **Conclusions:** Upon completion of this study, it was concluded that the morbid obesity and obesity are the independent forecasters of hypoalbuminemia.

INTRODUCTION

Obesity is defined as an abnormal deposition of body fat and is evaluated utilising the Body Mass Index (BMI) [1,2]. Obesity with BMI≥30kg/m^2 or overweight with BMI ranging between 25 to 29.9 kg/m^2) is linked to mortality and illness. This fact has been developed in the medical field for even more than two millennia [3-4]. Overweight is becoming increasingly prevalent in all age categories and is currently regarded a worldwide epidemic. Obesity was believed to affect 108 million children and 604 million adults in 2015. Its prevalence has increased among almost all regions of the world since 1980, nearly doubling in 70 countries [5].The complications of obesity are linked to a variety of chronic conditions, including metabolic syndrome, type 2 diabetes mellitus, coronary heart disease, obstructive sleep apnea, osteoarthritis, Non-Alcoholic Fatty Liver Disease (NAFLD), and breast, colon, and many other malignancies [6-7]. Key factors which are contributing to increase the obesity burden are changing trends of food, rapid industrialization, urbanization and sedentary lifestyle. This fact is known that various countries having the highest burden of obesity also have the highest burden of metabolic syndrome and diabetes mellitus [8]. Previously only developed countries were facing this major public health issue of obesity but now for the last 20 years, prevalence of obesity has

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increased to three times in all age groups both in developing and developed countries because of accelerated environmental and social transition. On the other hand, developing countries are already facing various issues of malnutrition, especially in children [9]. Albumin is a plasma protein that is the most abundant and synthesized in the liver. In the medical field, it is used as an indicator of chronic starvation and malnutrition. Hypoalbuminemia is defined as serum albumin less than 3.5 mg/dl and it is prevalent in people who have acute or chronic health issues. According to the literature, 20% of patient populations have hypoalbuminemia at the time of hospitalisation. Various conditions can cause hypoalbuminemia, the most common are acute and chronic inflammatory responses. According to The Academy of Nutrition and Dietetics albumin level should be interpreted with caution because of its negative correlation with kidney, liver, and other different inflammatory diseases [10]. The evaluative criteria for abnormal albumin threshold assessment in obese patients is not well characterised. According to the scientific evidence, "obesity is a chronic inflammatory condition in which adipocyte hypertrophy and hypoxia result in the formulation of pro-inflammatory cytokines, including tumour necrosis factor-alpha [11-12]. Yet another prospect could be that this chronic inflammatory condition causes modified serum albumin thresholds in obese people. In a study of the literature, researchers looked at the relationship among Body Mass Index (BMI) and albumin levels in adults with diabetes [13-14] or the relationship between body mass index and glycated albumin [15]. According to one research, serum albumin levels in obese non-diabetic youngsters are low [16]. Few researches have looked at obesity and morbid obesity as predictive factors of hypoalbuminemia in adults. One of these studies showed "obese subjects had significantly higher odds of hypoalbuminemia, with Odd Ratio (OR) of 4.10, 95% Confidence Interval (CI) ranging between 1.50 to 11.27 with P-value of 0.006, as did morbidly obese subjects having OR of 6.94, 95% CI ranging between 1.91 and 25.23 and P-value of 0.003" [17]. Further studies are required to make recommendations to interpret albumin in obese individuals. The purpose of this research was to identify the relationship between obesity and morbid obesity and hypoalbuminemia in adults in Pakistan with no signs of liver or kidney disease.

METHODS

Jinnah Allama Iqbal Institute of Diabetes and Endocrinology (JAIDE), Jinnah Hospital, Lahore Pakistan, was chosen for the completion of this cross-sectional study with a time frame of October 2019 to April 2020 after the synopsis approval from College's ethical review board. The study was carried out based on the importance of a better clinical practice, as demonstrated in the Declaration of Helsinki. 90 patients, ranging between ages of 18 and 70 years, without liver and kidney diseases, were recruited. Every participant was provided with written informed consent. The participants were divided into three categories, healthy control (BMI 18.5 to 24.9 kg/m2), obese (BMI 25 to 29.9 kg/m2) and morbidly obese (BMI >30 kg/m2). Patients with BMI <18.5 kg/m2, liver and kidney disease were eliminated from the research. The research included demographic data such as height, weight, and gender. Body mass index (BMI) was determined by dividing body weight in kg by body height squared in meters. Patients were asked regarding diabetes, any chronic illness, medications ever used, and the presence of other comorbidities. Venous blood samples for albumin were taken.

Calculation of sample size was achieved by the following formula:

$$n = \frac{(z_{1-\beta} + z_{1-(\alpha/2)})^2 \ (\delta_1^2 + \delta_2^2)}{(\mu_1 - \mu_2)^2}$$

Where the study power is equal to 90% and significance level is equal to 5% [17].

And,

$z_{1-\beta}$ = 90% power of the study

$z_{1-(\alpha/2)}$ = 5% level of significance

μ_1 = Anticipated mean Albumin levels in healthy controls

μ_2 = Anticipated mean Albumin levels in obese cases

δ_1 = Standard deviation of Albumin levels in healthy controls

δ_2 = Standard deviation of Albumin levels in obese cases

n = Minimum sample size for each group

The Statistical Package for Social Sciences (SPSS) version 20.0 was leveraged to assess the complete data (IBM Statistics Incorporated, Chicago, IL, USA). Frequency and percentage were given for gender and hypoalbuminemia. The chi-square test was utilised to evaluate the relationship between obese and morbidly obese status and hypoalbuminemia. Additionally, p-value ≤ 0.05 was taken as significant.

RESULTS

Out of 90 subjects, 30 were obese, 30 were morbidly obese and 30 were healthy control. The mean age of the healthy control was 37.7 ± 14.7, the mean age of the obese group was 41.5 ± 13.7 and the mean age of the morbidly obese group was 45.8 ± 13.5. According to one-way ANOVA test, no statistically crucial differentiation in mean age among groups was discovered. Table 1.

Variables	Healthy controls	Obese	Morbidly obese	P-Value
Age (in years)	37.7 ± 14.7	41.5 ± 13.7	45.8 ± 13.5	0.087

Table 1: showing mean age of among groups

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Chi square test showed that gender distribution was similar among all three groups with a p-value of 0.295, Table 2.

Category	Gender		P-Value
	Male	Female	
Healthy control	16 (53.3%)	14 (46.7%)	0.295
Obese	10 (33.3%)	20 (66.7%)	
Morbid obese	13 (43.3%)	17 (56.7%)	

Table 2: showing gender distribution among groups

Diabetic patients were higher in the obese and morbidly obese group however; this difference was statistically insignificant with a p-value of 0.094, Table 3.

Category	Diabetes Mellitus		P-Value
	Yes	No	
Healthy control	8 (26.7%)	22 (73.3%)	0.094
Obese	14 (46.7%)	16 (53.3%)	
Morbid obese	16 (53.3%)	14 (46.7%)	

Table 3: diabetic patients among groups

The percentage of hypoalbuminemia was 10.0% in healthy controls, 40.0% in the obese group, and 46.7% in the morbidly obese. The chi-square test showed that the hypoalbuminemia rate was significantly higher in obese and morbidly obese groups as compared to healthy controls, Table 4.

Category	Hypoalbuminemia		P-Value
	Yes	No	
Healthy control	3 (10.0%)	27 (90.0%)	0.005
Obese	12 (40.0%)	18 (60.0%)	
Morbid obese	14 (46.7%)	16 (53.3%)	

Table 4: showing a comparison of hypoalbuminemia among groups

The median albumin levels of healthy control were 4.1 (3.7 - 4.3), the median albumin levels of the obese group were 3.8 (3.3 - 3.9) and the median albumin levels of the morbidly obese group was 3.6 (3.3 - 3.8). -+Kruskal-Wallis test revealed a statistically significant variation in median albumin status among groups. Pair wise comparison indicated that the median albumin levels of obese and morbidly obese group was significantly lower as compared to healthy controls while no significant variation was determined between obese and morbidly obese groups, Table 5.

Variables	Healthy controls	Obese	Morbidly obese	P-Value
Albumin (g/dL)	4.0 ± 0.33	3.7 ± 0.39	3.6 ± 0.25	< 0.001
	4.1 (3.7 - 4.3)	3.8 (3.3 - 3.9)	3.6 (3.3 - 3.8)	

Table 5: Showing mean albumin among groups

DISCUSSION

The results of this study recommends significant hypoalbuminemia status in comparison with healthy control group (p-value 0.005) with obese and morbidly obese patients. There was no impact of including age, sex and diabetes mellitus in results. So individuals with normal BMI had a low incidence of hypoalbuminemia. The results of our study align with that of prior conducted studies, demonstrating a negative correlation between obesity and children and adults' albumin levels [13,17]. Prior researches have revealed a negative association between albumin and BMI among adults but only diabetic patients were included in these previously described studies [14-15] and instead of simple albumin, they assessed glycated albumin [14] or only compared albumin levels among various obesity groups [18]. According to a Brazilian study, more than 85% of overweight and obese elderly individuals, admitted to the hospital had hypoalbuminemia in correlation with age and nutritional status instead of BMI and metabolic syndrome [19]. While our study compares the hypoalbuminemia in obese and morbidly obese subjects with the healthy control group. Medical and surgical outcomes of the patient can be predicted using serum albumin levels [20-22]. Mortality and morbidity in critically ill patients can be independently predicted using albumin levels [23]. Surgical data also suggested that patients with hypoalbuminemia had poor surgical outcomes like delayed wound healing, need for repeat surgery, and higher readmission rates.

CONCLUSIONS

In our studied population, the prevalence of hypoalbuminemia was significantly high among obese and morbidly obese persons as compared to the healthy control group. As hypoalbuminemia is an important independent prognostic factor among surgical, medical, and critically ill patients, internationally clear consensuses are needed to interpret hypoalbuminemia among obese and morbidly obese persons. This study may help make these consensuses but further studies may also be needed.

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Original Article

Frequency of Endometriosis in Females with Infertility Undergoing Diagnostic Laparoscopy

Tahira Tabbsum[1*], Sehrish Nafees[2], Trevor Hayes[3], Syed Mehmood ul Hassan[4] and Abdul Sattar[5]

[1]Saint Lukes Hospital Kilkenny, Ireland
[2]University Hospital Cork, Ireland
[3]Saint Luke's General Hospital Kilkenny, Ireland
[4]Department of Medicine, Services Hospital Lahore, Pakistan
[5]Tallaght University Hospital, Ireland

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***Corresponding Author:**
Tahira Tabbsum
Saint Lukes Hospital Kilkenny, Ireland
drsattar09@gmail.com

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ABSTRACT

Endometriosis is the most common, chronic condition. Although some females are asymptomatic, the majority of women come with infertility, adnexal mass, or pelvic pain. Endometriosis treatment in the context of infertility poses a variety of challenging clinical issues. **Objective:** The objective of current study is to identify frequency of endometriosis on laparoscopy in females with infertility. **Methods:** This retrospective study was done at the Department of Obstetrics and Gynaecology, Saint Luke's General Hospital, Kilkenny, Ireland. Medical records of 215 females meeting the inclusion criteria underwent diagnostic laparoscopy were included. Basic demographical details and clinical examination was evaluated and presented through descriptive statistics. On diagnostic laparoscopy, representative sample was taken and sent to hospital histopathology for evaluation of endometriosis. Chi square test was applied to identify the influence of variables on endometriosis. **Results:** Mean age of females was 28.67 ± 6.35 years. Mean duration of marriage was 6.63 ± 5.26 years. There were 80 (37.21%) women in which endometriosis was diagnosed. No significant statistical association was seen for endometriosis with age, infertility type and duration of infertility. **Conclusions:** The findings of this study show an increasing trend in endometriosis identification or occurrence in women with infertility. Endometriosis with infertility is not an uncommon disease in women. Though laparoscopy is intrusive method, but with the right training the issues and complications that come with it can be reduced, which benefits the patients and offers us a clear picture or pathology of the disease.

INTRODUCTION

Infertility is the inability to successfully carry a child after 12 months or more of suitable, unprotected sexual activity or therapeutic donor insemination [1]. Untreated infections, anovulation, and endometriosis are the major socioeconomic reasons of female infertility [2]. Endometriosis is characterized as a prolonged, inflammatory, and oestrogen-dependent condition defined by the expansion of the tissue of endometrium outside the uterus [3]. The prevalence of this condition ranges from 9% to 50 % among females who are infertile, but it can reach 80% in those who experience chronic pelvic pain [4]. Since endometriosis is challenging to identify and manage, it is an enigma in gynaecology. It causes a wide range of disabling symptoms and has negative consequences on reproductive capacity [5]. Laparoscopy, in addition to providing information on uterine normality, tubal and ovarian status, and other pelvic pathologies, such as pelvic inflammatory disease, endometriosis, tuberculosis, and pelvic congestion. Laparoscopy is the cornerstone in the diagnosis. Because it allows for the visual confirmation of the tiny endometriosis lesions and aids in the staging of the disease [6]. According to a study in Pakistan, endometriosis occurs in 55% of women [2]. Another study from Pakistan found

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that 16.8% of 796 infertile women had endometriosis [7]. In contrast, a different study found that 6.5% of females experiencing infertility had endometriosis [8]. This current study was done to assess the frequency of endometriosis during laparoscopy among infertile women. Even though a lot of literature available, but the statistics are inconsistent for endometriosis in infertile women i.e. range from 6.5% to 55% [2,8]. Therefore, no inferences about its management and the avoidance of further difficulties can be made in light of these shifting figures. The current study's findings will provide a precise picture of the frequency, allowing us to screen these women early and, with the right care, reduce their burden and associated morbidity.

METHODS

The current retrospective study was conducted at the Department of Obstetrics and Gynaecology, Saint Luke's General Hospital, Kilkenny, Ireland. Medical records of 215 females who met inclusion criteria and underwent diagnostic laparoscopy from 2013 to 2016 were evaluated. Basic demographic information and a clinical evaluation were assessed. A representative sample was collected during a diagnostic laparoscopy and forwarded to the hospital's histopathology department for endometriosis examination. The collected data were entered and analysed through SPSS version 20.0. Quantitative data like age, duration of infertility was presented in form of mean ± S.D while frequency (%) was used for categorical data like frequency of endometriosis, type of infertility. Data was stratified for age, types of infertility (primary or secondary) and duration of infertility. Chi square test was applied to identify the influence of variables on endometriosis, p-value ≤ 0.05 was considered as significant.

RESULTS

In the current study, 215 females were included. Results showed the mean age of the females was 28.67 ± 6.35 years. Minimum and maximum age of women was 19 and 40 years respectively. According to figure 1, there were 150 (69.77%) women who had primary and 65 (30.23%) had secondary infertility.

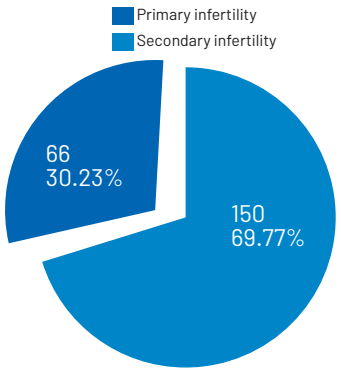

Figure 1: Frequency distribution of type of infertility

According to table 1, mean duration of marriage was 6.63 ± 5.26 years. Minimum and maximum duration of marriage was 1 and 20 years, respectively. The results according to table 1 also shows that mean infertility duration was 1.51 ± 1.33 years. Minimum and maximum duration of infertility was 1 and 10 respectively.

Items		
Mean Duration of Marriage	Mean ± SD	6.63 ± 5.26
	Minimum	1
	Maximum	20
Mean Duration of Infertility	Mean ± SD	1.51 ± 1.336
	Minimum	1
	Maximum	10

Table 1: Descriptive statistics of mean duration of marriage and descriptive statistics of mean duration of infertility

According to figure 2, there were 80 (37.21%) women in which endometriosis was diagnosed

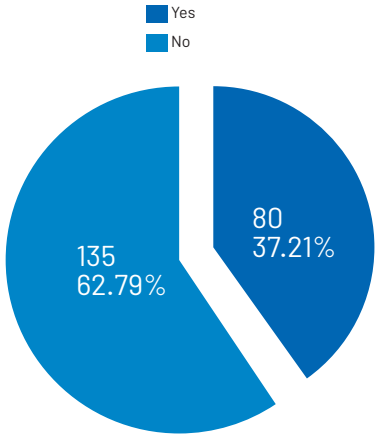

Figure 2: Frequency distribution of endometriosis.

Based on the analysis in table 2, women who were positive for endometriosis among them 28 (35%) were the age group 19-25 years, 21 (26.3%) were in the age group 26-30 years, 18 (22.5%) were in the age group 31-35 years and 13 (16.3%) were in the age group 36-40 years respectively. Although the frequency is highest in the younger age group i.e. 19-25 years but no statistical significant association was seen between age of women and endometriosis. i.e. (p-value=0.623)

Age Groups	Endometriosis		Total	P-Value
	Yes	No		
19-25	28 (35%)	51 (37.8%)	79	0.623
26-30	21 (26.3%)	26 (19.3%)	47	
31-35	18 (22.5%)	30 (22.2%)	48	
36-40	13 (16.3%)	28 (20.7%)	41	
Total	80	135	215	

Table 2: Frequency distribution for endometriosis in terms of age of women

According to table 3, among diagnosed cases of endometriosis 55 (68.8%) women suffered from primary and 25 (31.3%) women suffered from secondary infertility.

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Although a high frequency of primary infertility was seen in women who had endometriosis. But statistically no significant association was seen between infertility type and endometriosis. i.e. (p-value=0.803).

Infertility Type	Endometriosis		Total	P-Value
	Yes	No		
Primary	55 (68.8)	95 (70.4)	150	0.803
Secondary	25 (31.3)	40 (29.6)	65	
Total	80	135	215	

Table 3: Frequency distribution in terms of type of infertility

According to table 4, women who were diagnosed with endometriosis among them 76 (95%) women duration of infertility was in between 1-3 and 4 (5%) women's duration of infertility was in between 7-10. No statistically significant association was seen between duration of infertility and endometriosis.

Duration of Infertility	Endometriosis		Total	P-Value
	Yes	No		
1-3	76 (95%)	124 (91.9%)	200	0.297
4-6	4 (5%)	7 (5.2%)	11	
7-10	0 (0%)	4 (3%)	4	
Total	80	135	215	

Table 4: Frequency distribution for Endometriosis in terms of duration of infertility

DISCUSSION

Infertility is a worldwide issue and more than 70 million couples are infertile [9]. Results from this study indicates that 69.77% of the females were diagnosed with primary infertility while 30.23% were suffering with secondary infertility. These results are corresponding from the previous study findings which shows that endometriosis affects 25 to 50% of infertile women, while 30 to 50% of women affected due to endometriosis are infertile [10]. More recent findings show that in the last 30 years, the incidence of endometriosis has not changed, remaining at 2.37-2.49/1000/y, corresponding to a 6% to 8% prevalence [11]. From the results of this study, it is evident that 37.21% of the females were diagnosed with endometriosis. Endometriosis has been reported in about 63% of infertile women worldwide [12]. According to the findings of a local study. Endometriosis was found in 12% of infertile women who had diagnostic laparoscopy. Endometriosis was diagnosed among 4 (12.5%) and 2 (11.1%) cases of primary and secondary infertility respectively [13]. The results are consistent with the findings of another study conducted by Amogh Chimote from India, results showed a 32% prevalence of endometriosis [14]. Frequency of endometriosis reported in this study is a bit higher than the frequency reported in the local literature. i.e. this study; 37.21% vs. frequency range reported in local literature; 5%-17%. Previous research by Parveen S found a substantially lower prevalence of endometriosis. Specifically, (14% and 8%) [15]. According to Sebastio F de Medeiros from Brazil, endometriosis was found most frequently in women having laparoscopic infertility treatment, i.e. 73.6% [16]. The results of current study demonstrated that the frequency of endometrium in the younger age group were highest i.e. 19-25 years. Fecundity in normal couples' ranges from 0.15 to 0.20 each month and diminishes with age. Endometriosis patients have a reduced monthly fecundity of around 0.02-0.1 per month [17]. Furthermore, endometriosis is linked to a reduced live birth rate [18]. In the present study, highest frequency of primary infertility i.e. 68.8% was found among females who were diagnosed with endometriosis. Another study shows that up to 50% of women with endometriosis are infertile [19]. Based on typical laparoscopic observations, pelvic anatomical distortion, or the "pelvic factor," can more easily explain infertility in individuals suffering from severe endometriosis. Major pelvic adhesions can limit release of oocyte from the ovary, impede ovum pickup, or restrict ovum transport. Endometriosis patients may experience endocrine and ovulatory problems such as luteinized unruptured follicle syndrome, poor folliculogenesis, multiple LH surges and luteal phase defects [20]. Researchers have argued over the relationship between endometriosis and infertility for a long time. Although a significant amount of research suggests a link between endometriosis and infertility, a causal relationship has not been proved. Endometriosis, however, can cause pelvic adhesions or abnormal pelvic anatomy that prevent fertility.

CONCLUSIONS

The findings of this study show an increasing trend in endometriosis identification or occurrence in women with infertility. Endometriosis with infertility is not an uncommon disease in women. Though laparoscopy is intrusive method, but with the right training the issues and complications that come with it can be reduced, which benefits the patients and offers us a clear picture or pathology of the disease.

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Original Article

Incidence and Their Associated Factors of Non-Communicable Diseases Among Khyber Pakhtunkhwa Population

Zia ul Ain Sabiha[1], Arshad Hussain Hashmi[2], Arooj Irfan[3], Irfan Ullah[4], Rehana Rasool[5], Ghazala Rasool[6], Tayyaba Zia[7], Sudhair Abbas Bangash[8] and Irfan Ullah[9*]

[1]Department of Community Medicine, Peshawar Medical College, Peshawar (Affiliated with Riphah International University, Islamabad, Pakistan)
[2]Director ORIC, Virtual University of Pakistan Lahore
[3]Department of Community Dentistry, Peshawar Medical and Dental College, Peshawar, Pakistan
[4]Medical Superintendent, Medical Emergency Resilience Foundation (MERF) Organization, Pakistan
[5]Department of Community Medicine, Abbottabad International Medical College, Abbottabad, Pakistan
[6]Department of Medicine, Northern Border University Arar, Kingdom of Saudi Arabia
[7]Department of Public Management, School of Humanities and Law, Yanshan University, Qinhuangdao, China
[8]Faculty of Life Science, Department of Pharmacy, Sarhad University of Science and Information Technology, Peshawar, Pakistan
[9]Department of Life Sciences, University of Management and Technology (UMT), Lahore, Pakistan

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***Corresponding Author:**

Irfan Ullah
Department of Life Sciences, University of Management and Technology (UMT), Lahore, Pakistan
irfan.ullah@umt.edu.pk

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ABSTRACT

World Health Organization proposes implementing the WHO STEP smart strategy for tracking, to continuously monitoring noncommunicable diseases (NCDs) and associated risk factors (STEPS). **Objective:** To analyze the prevalence and contributing factors of NCD risk factors in Pakistan, a country with a low income where NCDs are responsible for 66 percent (or two-thirds) of fatalities annually. **Methods:** Total 675 eligible participants, ages 15 to 60, were selected by a multistage sampling approach from February 2020 and May 2021 for STEPS survey (version of instrument 3.2). Assessment of behavioral and physiological risk variables was part of the data collection process. SPSS version 25 was used for data analysis. **Results:** Intake of lesser than five portions of vegetables and fruits every day may be the greatest common risk factor. Of all participants, 341 (50.51%) were smoking currently, 513 (76%) were not physically active. A total of 251 (37.18%) individuals have elevated blood pressure whilst 245 (36.29%) individuals are affected by sugar. The cholesterol level is high in 215 (31.85%) participants out of 675. Each individual had an average of two risk factors for NCDs (2.04, 95percent [Confidence interval]: 2.02-2.08). **Conclusions**: Numerous risk factors for NCDs are present in a significant section of the Pakistani community. With the help of a multi-sectoral national coordination system, this observed data must be employed to promote and track specific NCD management and prevention programs for cities across Pakistan.

INTRODUCTION

The majority of diseases in the world are caused by NCDs (non-communicable diseases) [1]. NCDs account for 71 percent of all fatalities worldwide, estimated by World Health Organization (WHO) with low- and middle-income nations (LMICs) accounting for 85 percent of NCD-related premature deaths [2]. The primary root causes of NCDs have been recognized as behavioral risk aspects, which include smoking, alcohol consumption, lack of physical

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activity and unhealthy eating's well as biological risk factors, together with elevated blood glucose, blood pressure (BP)and cholesterol levels, like obesity and overweight [3]. Additionally, it has been shown that clustering, or the coexistence of several risk factors in one person, increases the likelihood of NCDs progressing [3-5]. The number of fatalities from NCDs increased by 8% between 2014 and 2016, according to figures from Pakistan, a country with a lower middle income. In 2017, 182,751 deaths, two third (66%) reported in Pakistan were attributable to NCDs [1]. The rising burden of non-communicable diseases, including the higher incidence of diabetes, COPD, coronary artery disease and chronic kidney disease is also shown in a 2019 in Pakistan based on population worldwide cross-sectional survey. This could present a significant challenge to the country's health systems in the upcoming years. In addition to these illnesses, it is known that a considerable number (8.5%) of Pakistani's elderly population suffers from diabetes mellitus [6]. In Pakistan, 2013 STEPS survey also confirmed significant incidence of a number of risk factors, like smoking (19%), low fruit and vegetable intake (99%), abnormal lipid levels (23%) and high blood pressure (26 %) [7]. Similarly, a high percentage of Pakistani people (19.9%) were discovered to have hypertension, and Twenty-one percent of them (21.4%) were obese or overweight [8]. The Pakistani government approved a Multisectoral Action Plan for the Prevention and Control of non-diseases in 2014 to fight NCDs at the statistical level [9]. A quarterly NCD STEPS study was one of the primary initiatives selected and featured in the Multisectoral action plan to monitor progress on NCD's prevention and management across the nation. Pakistan requires information on NCD's risk factors at the provincial state due to the recent change to a federal system in order to simplify decision-making in the medical sector. This research was aimed to evaluate the epidemiological spread and indicators of biological risk factors (raised blood sugar, raised BP, overweight/obesity and cholesterol levels) as well as behavioral risk factors (tobacco, salt consumption, physical activity and diet) linked with significant NCDs in Peshawar of Khyber Pakhtunkhwa, Pakistan.

METHODS

Attached to the boarder to China and India in Southern Asia is the Pakistan. Strategies for sampling and study development, implementing the WHO STEP wise strategy to surveillance (STEPS), a comprehensive surveillance method was used for information on NCDs. It was a cross sectional survey of NCD risk variables that was globally relevant. Between February and May 2019, information for the survey was obtained from the population of eligible adults (those individuals whose are older than 19 years according to WHO) who ranged in age from 15 to 60. In order for survey results to be generalized to the cities scale, sampling for the study considered Pakistan existing federal system. 675 suitable individuals from Peshawar of Pakistan were chosen using multistage cluster sampling technique. Compared to earlier STEPS studies, the sampling procedure was more thorough and associated with smoking, inadequate fruit/vegetable intake, and inappropriate physical exercise are all taken into account as behavioral factors in this research. Likewise, being overweight and having high blood pressure are considered physiological factors. Elevated blood cholesterol and blood sugar levels are regarded as one biological component. The study also inquired about programs and policies for cigarette use. Additionally, it queried on musculoskeletal discomfort, aggression, and injuries. Additionally, the amount of salt consumed was calculated in this round of the STEPs questionnaire through spot urine sampling, and the WHO recommended Cardio Check, PA was used to test sugar levels and cholesterol level concentrations. For nominal or ordinal data association chi square test was used whilst for continuous data pearson correlation was used. The method of incidence of the NCD is the point of care testing like for the cardiovascular disease is ECG and obesity is BMI. Statistically data was analyzed by IBM SPSS version 25. A p value less than 0.05 was considered statistically significant.

RESULTS

A total of 675 individuals were included in the survey, the included participants have some sort of diseases. Three hundred (44.4%) of the participants were female, whilst the 375 (55.6%) were male. Volunteers made up 164 (24.27%) of the population between the ages of 15 and 30, 256 (38.30%) between the ages of 31 and 45, and 250 (37.32%) between the ages of 46 and 60. About 169 (25%) worked as self-job, and about 313 (46.30%) had just finished their primary education. Approximately 425 (63%) of the participants were married as shown in the Table 1. Among all the 675 individuals, 341 (50.51%) were smokers. The majority of participants 83 (24.37%) reported currently smoking, with men 189 (55.48%) and those in their 45th to 60th year of life 127 (37.32%). Additionally, those who were less educated had a greater prevalence of current smoking (46 %). Among the least wealthy (poorest) quintiles 102 (30%) were smokers. Contrarily, persons who were employed 82 (24 %) and married 123 (36%) had increased tobacco consumption (Table 1).

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Participants Characteristics	Details	Total	Smoker (341, 50.51%)		Less intake of fruit/ vegetables (403, 59.70%)		Sugar (245, 36 .29%)		Exercise (513, 76%)		Blood Pressure (251, 37.18%)		Cholesterol (215, 31. 85%)	
Age Group	15-30	(24.31%)	(24.37%)	P=0.001	(26.37%)	P=0.739	(23.37%)	P=0.001	(22.37%)	P=0.001	(20.37%)	P=0.001	(20.37%)	P=0.001
	31-45	(38.26%)	(38.30%)		(36.30%)		(39.30%)		(36.30%)		(341.30%)		(35.30%)	
	46-60	2095 (37.45%)	(37.32%)		(37.32%)		(37.32%)		(41.32%)		(38.32%)		(44.32%)	
Gender	Female	(44.52%)	(42.12%)	P=0.001	(38.12%)	P=0.403	(41.12%)	P=0.219	(52.12%)	P=0.1	(41.12%)	P=0.001	(39.12%)	P=0.001
	Male	(55.48%)	57.78%		61.78%		58.78%		47.78%		58.78%		60.78%	
Education Level	Primary	(46.30%)	(46%)	P=0.001	(47%)	P=0.001	(43%)	P=0.469	(46%)	P=0.232	(44%)	P=0.001	(41%)	P=0.001
	Secondary	(24.61%)	(22.5%)		(21.5%)		(24.5%)		(22.5%)		(23.5%)		(24.5%)	
	Higher	(11.81%)	(10.25%)		(11.25%)		(11.25%)		(10.25%)		(10.25%)		(12.25%)	
	None	(21.25%)	(21.22%)		(20.22%)		(21.22%)		(21.22%)		(22.22%)		(22.22%)	
Financial Status	Richest	(28%)	(21%)	P=0.001	(19%)	P=0.5	(20%)	P=0.001	(21%)	P=0.001	(23%)	P=0.02	(22%)	P=0.02
	Rich	(12%)	(19%)		(20%)		(19%)		(17%)		(15%)		(18%)	
	Upper Middle Class	(18%)	(17%)		(16%)		(17%)		(18%)		(20%)		(17%)	
	Lower Middle Class	(19%)	(13%)		(15%)		(13%)		(14%)		(12%)		(14%)	
	Poor	(19%)	(30%)		(33%)		(31%)		(30%)		(30%)		(29%)	
Job Status	Student	(12%)	(15%)	P=0.001	(18%)	P=0.03	(17%)	P=0.002	(20%)	P=0.001	(20%)	P=0.001	(14%)	P=0.001
	Employed	(31%)	(24%)		(22%)		(21%)		(20%)		(22%)		(21%)	
	Unemployed	(17%)	(26%)		(28%)		(29%)		(25%)		(27%)		(27%)	
	Self-Job	(25%)	(23%)		(20%)		(21%)		(23%)		(20%)		(24%)	
	Other	(15%)	(12%)		(12%)		(12%)		(12%)		(11%)		(14%)	
Marital Status	Yes	(63%)	(36%)	P=0.001	(35%)	P=0.8	(31%)	P=0.001	(33%)	P=0.001	(30%)	P=0.001	(29%)	P=0.001
	No	(27%)	(24%)		(23%)		(28%)		(25%)		(25%)		(22%)	
	Divorced	(10%)	(40%)		(42%)		(41%)		(42%)		(45%)		(51%)	

Table 1: Distribution of NCD risk factors among socio-demographic characteristics

The vegetable and fruit use are less. 403 (59.70%) out of all participants did not take the necessary fruit. Participants' sex and education's degree were significantly linked to smoking and high blood pressure. Patients between the ages of 30-44 and 45-60 shown to have an elevated chance of being overweight and having high blood cholesterol, blood sugar, and blood pressure. Participants in greatest wealth percentile also had increased risks of being overweight, insufficiently active, and having elevated blood cholesterol. Each individual had an average of two risk factors for NCDs (2.04, 95 percent [Confidence interval]: 2.02-2.08)(Table 2).

Participants Characteristics	Details	ARR with CI=95%	Mean of ERF with 95% CI
Age Group	15-30	Ref	1.7 (1.67-1.75)
	31-45	1.06 (1.03-1.10)	2.05 (1.90-2.20)
	46-60	11.205 (1.13-1.28)[1]	1.86 (1.81-1.92)
Gender	Female	Ref	1.85 (1.8-1.95)
	Male	1.15 (1.03-1.28)	1.87 (1.30-2.45)
Education Level	Primary	11.2 (0.90-1.5)	2.10 (2.00-2.20)
	Secondary	0.97 (0.92-1.05)	2.1(2.01-2.10)
	Higher	0.85 (0.7-1)[1]	1.97(1.80-2.07)
	None	Ref	2.11(2.01-2.22)
Financial Status	Richest	1.15 (1-1.30)	2.13(1.97-2.12)
	Rich	11.1 (1-1.2)	2.51(2.01-2.17)
	Upper Middle Class	11.03 (0.9-1.20)	2.03(1.93-2.11)
	Lower Middle Class	0.99 (0.96-1.09)	1.94(1.87-2.02)
	Poor	Ref	2.00(1.95-2.05)
Job Status	Student	0.8 (0.73-0.92)[1]	2.5(2.00-2.10)
	Employed	Ref	2.12(2.07-2.24)
	Unemployed	0.9 (0.78-1.03)	2.08(1.95-2.21)
	Self-Job	1.05 (1-1.10)	1.90(1.81-2.00)
	Other	1.03 (0.87-1.20)	2.36(2.10-2.63)
Marital Status	Yes	0.93 (0.84-1.03)	2.06(2.01-2.12)
	No	Ref	2.105(2.02-2.19)
	Divorced etc	0.99 (0.88-1.12)	2.23 (2.15-2.32)

AAR; Adjusted Relative Risk,
ERF; Existing Risk Factors
1; Significant with a p-value less than 0.05

Table 2: Clustering of NCD risk factors and its multivariable analysis

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DISCUSSION

The rate of prevalence of the current smoking (24%) has remained mostly unchanged from the STEPS study's previous poll (19%), and these results are comparable to those of GATS 2017study of Bangladesh [9-11]. The total tobacco control law that was adopted in 2011 may have contributed to the comparatively consistent smoking level that has been seen since 2013 [12]. In addition, rising literacy rates, greater public awareness of the negative health effects of smoking, effective application and surveillance and supervision of tobacco control law provisions like visual health warnings, and tobacco company's litigation could have all been significant factors in maintaining the status quo or reversing the upward pattern in cigarette consumption. Research has shown that a number of variables, such as tobacco industry it's possible that the problem stems from marketing campaigns that portray smoking as more manly and from cultural acceptability of male smoking more than female smoking [13, 14]. According to the findings of the vegetable and fruit consumption, there has been a little increase intake since the STEPS survey's first round. No considerable correlation between consuming the required amounts of fruit and vegetables was discovered by multivariable analysis. Comparison to the observations of an earlier study, this survey indicated that individuals with higher literacy rates (greater than higher education level) were very much able to intake necessary quantities of vegetable and fruits when comparing to lesser groups which are educated [15]. The overall prevalence of an inadequate vegetables and fruits intake in the population in Pakistani's might be due to a number of reasons, including restricted availability, accessibility, and price of fruits and veggies as well as societal attitudes on their use. Additionally, people might not be adequately informed about the requirement of eating enough vegetables and fruit and the negative effects on health if they don't. Qualitative research might be used to better investigate this problem and offer more understanding into the Pakistanis population's inadequate consumption of fruits and vegetables. The results of this research may also be helpful in developing contextualized interventions meant to encourage appropriate consumption of fruits and vegetables. Physical inactivity is reported to be uncommon in the present study, which is consistent with findings from earlier national and international surveys [16, 17]. Lack of physical activity has increased since the 2013 STEPS study, but the highest prevalence of inactivity was observed to be among those in the top quintile of income. This could be because of the inactive lifestyles adopted by this class of individuals as a result of their professions and easier accessibility to transportation, which reduces the amount of time, spent walking each day. More than one-fourth of Pakistani people involved in the current analysis had increased blood pressure, which is comparable to results from the findings from the last survey of STEPS but a little more than results from NDHS survey conducted in 2016 i.e., 19.9 % [18]. So, this discrepancy might be the result of difference in methodology, or different sampling designs. The results of combined surveys show that high blood pressure is becoming more prevalent in Pakistan and suggest for adequate measures to avoid and manage this issue. Comparable to the 2016 Pakistan Demographic and Health Survey (PDHS) and prior STEPS poll, we observed that perhaps the prevalence of elevated blood pressure increased with age. Gender disparity was also observed when we talk about the prevalence of raised/elevated blood pressure. It was also discovered that a sex difference is also plays role in the prevalence of elevated blood pressure, in accordance to the results of earlier surveys. Raised blood pressure between the sexes may result from combined behavioral and biological causes [19]. Like sexual hormones, genetics, as well as other biological aspects of sex that are thought to prevent from elevated BP in females [19, 20]. However, a correlation between education level and elevated blood pressure was discovered, with a decreased prevalence within people who had higher education. This conclusion is in line with earlier STEPS and NDHS results. People with higher levels of education are more able to have access to data about the severe Hypertension and its effects, which may eventually encourage them to take precautionary steps [21]. According to WHO worldwide findings, 8 % of South Asians had elevated blood glucose levels, which are comparable to the figures from this study (6 %). The frequency of elevated blood glucose has increased from 3% to 6%, that should also be evaluated in light of the various methods used to assess blood sugar levels. The dry technique was applied through this stage of the study as compared to previous stages, which employed the wet approach to assess blood sugar levels. Similar to earlier studies conducted the prevalence of increased blood sugar levels increases as age increases. Age-related variations in obesity, physical inactivity, medication, comorbid illnesses, and insulin secretion abnormalities all have an impact on blood glucose levels [22]. In comparison to earlier surveys, when the rate of increased cholesterol level was determined to be 22.7%, the present study's finding of 11% is comparatively lower. This could be because the assessment methods were different. Just like 2013 report, we noticed that the prevalence of high cholesterol increased with age group, just as it did with high blood pressure. An age-dependent increase in level of blood cholesterol could be caused by a causative element related

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to the decrease in growth hormone synthesis with advancing age [23]. According to this, our findings that females are more likely to have elevated blood cholesterol levels might be explained by ageing and variations in the female sex hormone, estrogen. According to present research, average of two risk variables for NCDs have been observed in people of Pakistan. Along with highest wealth quintile, older individuals, and men having a higher average number of NCD risk variables. Indicating that as people grow older, risk variables tend to cluster more together, same conclusion that has been confirmed by different studies. It is anticipated that these issues will get worse in the upcoming years because Pakistan has had a substantial decrease in average lifespan and mean age population. Males tend to gather risk variables more than females, which might be a result of their risk-taking tendencies and unproductive lifestyles, including smoking, drinking, and lack of exercise. We also observed in a similar survey conducted in Bhutan clustering of NCD risk variable's prevalence was greater between wealthiest people. The clumping of NCD risk markers in the wealthiest group might be connected to adopting an unhealthy lifestyle, identical to particular risk variables like obesity/overweight and high blood pressure [23].

CONLCUSIONS

The significant majority of Pakistanis people had two or more NCD possible risks according to the results of this study. Prevalence of majority of the risk factors has grown since the 2013 STEPS study, which highlights a demand for efficient strategies to address this. Preventing or reducing the impact of controllable risk factors must be one of the main ways to lessen an impact of risk factors for NCD. This approach should also be more economical than treating NCD patients with curative therapies. Therefore, in order to establish a supportive environment for change in behavior, interventions targeting changeable risk factors need combined effort from several domains. The present Pakistani federal structure, where municipality is in charge of the healthcare system as well as other areas like education, infrastructure development, and the environment, can allow for coordinated efforts from various fields, that may be successful in lowering a workload of non-communicable diseases risk variables in state.

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Original Article

Frequency, Causes and Findings of Brain Computed Tomography Scan at University of Lahore Teaching Hospital

Hadia Akhtar[1*], Syed Muhammad Yousaf Farooq[1], Ali Shan[1], Muhammad Naeem[2], Ayesha Azhar[1], Sawaira Sajid Dar[1], Zainab Fayyaz[1], Esha Amjad[1], Arooj Fatima[1] and Hafsa Muhammad Noor[1]

[1]University Institute of Radiological Sciences and Medical Imaging Technology, The University of Lahore, Lahore, Pakistan
[2]University Institute of Public Health, The University of Lahore, Lahore, Pakistan

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***Corresponding Author:**

Hadia Akhtar
University Institute of Radiological Sciences and Medical Imaging Technology, The University of Lahore.
hadiaakhtar01@gmail.com

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ABSTRACT

Cranial computed tomography (CT) is the most generally utilized diagnostic method for the emergent evaluation of head trauma (TBIs) because it is readily accessible, quick, and sensitive for clinically relevant traumatic brain injuries as well as non-traumatic abnormalities. **Objective:** To determine the frequency, causes, and findings of brain computed tomography scan at The University of Lahore teaching hospital. **Methods:** A descriptive study was conducted at The University of Lahore Teaching Hospital. A sample of 202 brain CT scans from a total of 933 participants seen in the CT department was obtained using a suitable sampling technique. Data analysis was done using SPSS version 21.0. **Results:** There were 78 (38.6%) female patients and 124 (61.4%) male patients out of 202 total patients. The mean age of the patients was 47.1± 23 years. The most prevalent of them, brain atrophy, was observed in 63 (31.2%) of the patients. 51 (25.2%) patients had infarction, 36 (17.8%) had sinusitis, 24 (11.9%) had ischemic demyelination, and 16 (7.9%) had fractures and hemorrhages. In 8 (4.0%) patients, mastoiditis, tumors, and carcinoma were reported. 7 patients (3.5%) had cysts, 6 patients (3.0%) reported contusions, and 2 patients (1.0%) had abscesses. **Conclusions:** According to our research, the vast majority of individuals who underwent CT scans had a history of headache and falls and the most frequent observation in the patients was brain atrophy. Other major findings found were sinusitis and infarction.

INTRODUCTION

Years ago, plain film radiography was the primary imaging technique used to assess trauma victims [1]. The public introduction of computed tomography (CT) occurred in 1972 with a scan performed on patient at Wimbledon's Atkinson Morley Hospital, U.K., revealing a cystic frontal lobe tumor [2]. This was a significant advancement in the diagnostic options available to physicians during the 1970s [3]. After this, CT was immediately welcomed by the medical community [4]. CT has developed into a potent and popular diagnostic imaging technology, with almost 70 million exams carried out in the US alone [5]. Computed tomography became the first non-invasive method for obtaining images of the human body's interior that were not skewed by the superposition of different anatomical components with the aid of computer software. The clinician can observe pathology from a variety of angles, free from other anatomical structures, and can change contrast to focus on the soft-tissue and hard-tissue pathology in turn, when x-ray attenuation data is reconstructed into an image. Three-dimensional imaging of anomalies and anatomy is now possible because of technological advances in computer software. Therefore,

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when compared to traditional radiography, CT produces images with substantially higher contrast [6]. As it is easily accessible, rapid, and sensitive for clinically significant traumatic brain injuries, cranial computed tomography (CT) is the most often used diagnostic technique for the urgent evaluation of head trauma (TBIs). Although cerebral bleeding and skull fractures can be found using cranial CT, it is also sensitive to a variety of non-traumatic abnormalities that the patient or their family may not be aware of. CT can reveal soft-tissue abnormalities such disc herniation, soft tissue bleeding, and ligamentous rupture [7]. Due to its widespread availability and sensitivity to hemorrhage, computed tomography (CT) is used by the vast majority of institutions as the initial imaging test for patients with acute cerebral ischemia [8]. In the United States, traumatic head injuries afflict more than 1.7 million people annually, including about 500,000 children. 52,000 people pass away as a result [9]. Adults under the age of 45 and children up to the age of 15 years both suffer from head injuries more frequently than other causes. Neuronal and vascular tissue are compressed and sheared at the moment of impact in a head injury patient due to mechanical stresses. Further abnormal occurrences could result in brain damage. In this sense, a quick diagnosis and better patient care depend on the use of CT [10]. Around 7.5 million visits in patient care settings occur due to dizziness each year, and it is one of the most frequent presenting ailments in the emergency room (ED). Vertigo is the most prevalent type of dizziness, accounting for about 54% of complaints [11]. CT is routinely employed as a first-line imaging modality to rule out posterior fossa bleeding or a big mass as a cause of vertigo [12]. Most people experience headaches at some point in their existence. They are a frequent symptom. Between 70 and 95 percent of Americans get headaches at least every other year [13]. An examination of the physical and neurological systems is necessary for the evaluation of headache. Patients who are clinically determined to have secondary headaches should undergo neuroimaging, with CT being the initial suggested study due to its affordability and ability to detect the majority of secondary headache causes [14]. Although there are significant radiation exposure dangers associated with CT, it is nevertheless employed for radiological diagnosis due to its accessibility, affordability, higher sensitivity, and flexibility to allow for patient movement. It is well recognized that computed tomography (CT) is less sensitive than magnetic resonance imaging (MRI) for the early identification of certain pathologies. However, a variety of factors, including patient mobility, the longer imaging time, and the more expensive nature compared to CT have made CT the centre of emphasis for excluding particular disorders [15]. The following study contributed to the body of knowledge by finding the frequency, causes and findings of brain Computed Tomography scan at The University of Lahore Teaching Hospital in Pakistan. The results of this study indicated the true burden of diseases affecting brain in our population which will be beneficial for policy making and awareness campaigns in our population.

METHODS

In this descriptive study, during the time period of 4-month, 202 (21.6%) of the 933 patients examined by the CT department of The University of Lahore Teaching Hospital underwent a brain CT scan. TOSHIBA Aquilion CXL 128 slices CT scanner was used. Brain CT Scan followed by proper brain CT protocols was performed on these patients. Inclusion criteria involved both genders. Patients who visited the hospital's radiology department were included in the study and underwent a physical evaluation. Patients of all age groups were included in this study. Patients with the following causes i.e., fall, RTA, vertigo, headache, nausea and vomiting, body weakness, drug abusers, loss of consciousness were included. Exclusion criteria focused on uncooperative patients and any other finding other than the brain. After the approval of synopsis, descriptive study was done at The University of Lahore Teaching Hospital, Lahore. Quantitative variables i.e., age, gender was recorded on data collection sheets. All collected data was entered in SPSS version 21.0. After determining if the patient needed a CT scan, the technologist sent the patient to the radiology department, where he or she was scanned in accordance with the CT guidelines. The data was analyzed and presented in the form of tables, pie charts and histogram.

RESULTS

There were 78 (38.6%) female patients and 124 (61.4%) male patients out of 202 total patients. The mean age of the patients was 47.1± 23 years. The table 1 shows that 202 (21.6 percent) of the 933 CT scans that were performed were of the brain, while the remaining 731 (78.3 percent) were of the rest of the body.

CT scan	Frequency (%)
Other CT scans	731 (78.3%)
Brain CT Scans	202 (21.6%)
Total	933 (100%)

Table 1: Frequency of Brain CT scan in University of Lahore Teaching Hospital

The table 2 illustrates the causes, their frequency and percentage of the Brain Computed Tomography Scans performed at University of Lahore Teaching Hospital. The table 2 also represents that 20 (9.9%) of the 202 patients had a history of falling. 17 (8.4%) out of 202 patients experienced RTA. 7 (3.5%) patients out of 202 overall

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patients had a history of vertigo. 23 (11.4%) had headaches. 6 (3.0%) had a history of nausea and vomiting. 15 (7.4%) patients experienced body weakness. 2 (1.0%) patients had a history of vertigo while 14 (6.9%) had loss of consciousness.

Causes	Frequency (%)
Fall	20 (9.9%)
RTA	17 (8.4%)
Vertigo	7 (3.5%)
Headache	23 (11.4%)
Nausea and vomiting	6 (3%)
Body Weakness	15 (7.4%)
Drug Abuser	2 (1%)
Loss of consciousness	14 (6.9%)

Table 2: Causes with frequency and Percentage of Brain Computed Tomography Scans

The table 3 illustrates the findings, their frequency and percentage of the Brain Computed Tomography Scans performed at University of Lahore Teaching Hospital. The table represents that there were 202 patients in total, 16 (7.9%) of whom had fractures. Infarction was identified in 51 (25.2%) patients. 24 (11.9%) developed ischemia demyelination. Cyst were identified in 7 (3.5%) of the 202 individuals overall. 63 (31.2%) had brain atrophy. Out of 202 patients in all, 16 (7.9%) experienced hemorrhage. Sinusitis was detected in 36 (17.8%). 2 (1.0%) patients developed abscess. 8 (4.0%) had mastoiditis while contusions were identified in 6 (3.0%). 8 (4.0%) patients had a diagnosis of carcinoma and tumors.

Findings	Frequency (%)
Fracture	16 (7.9%)
Infarction	51 (25.2%)
Ischemic Demyelination	24 (11.9%)
Cyst	7 (3.5%)
Cerebral Atrophy	63 (31.2%)
Hemorrhage	16 (7.9%)
Sinusitis	36 (17.8%)
Abscess	2 (1%)
Mastoiditis	8 (4%)
Contusions	6 (3%)
Carcinoma & Tumors	8 (4%)

Table 3: Findings with frequency and Percentage of Brain Computed Tomography Scans

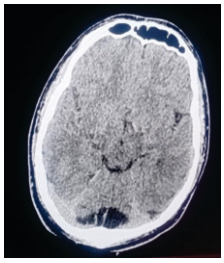

Figure 1: The following image shows Hemorrhage. Age of the patient was 22 years and had a history of RTA

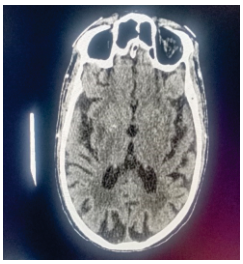

Figure 2: The following image shows brain atrophy. Age of the patient was 76 and had a history of headache

DISCUSSION

The aim of our research was to determine the frequency, potential causes, and results of brain computed tomography scans at the University of Lahore Teaching Hospital. A descriptive study was done for the diagnostic purposes of the anomalies associated with the brain. Variables like age, gender, history of falls, and RTA etc. were asked about in-depth with patients who were entirely compromised. A total of 202 patients of all ages and genders who underwent CT were included in the data, including 78 (38.6%) female patients and 124 (61.4%) male patients. According to our research study, the most prevalent findings were brain atrophy which was observed in 63 (31.2%) of the patients, 51 (25.2%) patients had infarction, 36 (17.8%) had sinusitis, 24 (11.9%) had ischemic demyelination, and 16 (7.9%) had fractures and hemorrhages. However, mastoiditis, tumors, and carcinoma were reported in 8 (4.0%) patients and other 7 patients (3.5%) had cysts. 6 patients (3.0%) reported contusions and 2 patients (1.0%) had abscesses. A study was conducted by Mebrahtu-Ghebrehiwet et al., at Orotta Hospital in Asmara, Eritrea with the aim to evaluate "the profile of CT scan findings in cases of severe head trauma". A total of 110 patients with acute head trauma underwent cranial CT scan between the time period of January through March 2006, along with November until December 2007 where the average age of the patients were 32.5 years old. According to radiological report, in 60 cases (54.5%), aberrant CT findings were found, and in 50 cases, normal CT findings (45.5 percent). The most prominent CT results were intra cerebral hemorrhages, which were found in 22% of cases and cerebral contusions or lacerations, which were found in 16% of cases. It was determined that head trauma was primarily caused by accidents involving falls [16]. In our study, falling is the second most common reason for a CT scan (9.9%), and men are more likely to need one. This is due to the fact that men use motor vehicles more frequently than women in Pakistan and disregard safety measures like helmet use and the most common finding was brain atrophy which was observed in 63 (31.2%) of the patients. A research study was conducted by

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Haghighi et al., Taba Radiology Center in Shiraz, Iran from April 2010 to August 2011. The aim of the study was to examine the frequency of anomalous results in pediatrics brain CT scans as well as the causes of requests for brain CT scans. A total of 167 children were included in this study and 84 of them were males and 83 were females that accounted for 50.3% and 49.7% respectively. The reported complains to perform head CT scan were headache in 73, head injury in 14, and seizure in 12 patients. Among 73 (60.8%) patients with headaches only 2.7% reported abnormal findings. The most often discovered aberrant findings included arachnoid cysts in 4 patients, cerebral hemorrhages in 3, atrophic alterations in 3 patients, hydrocephaly in 3 patients, and congenital underdevelopment in 2 patients [17]. Hemorrhage is the third most frequent finding in our study (7.9%), with subdural haemorrhage being the most frequent. Subdural bleeding originates in the veins, which is why it affects older people more commonly than younger people. Therefore, this form of haemorrhage results from the weakening of our blood vessels that occurs as we age. Additionally, our study revealed that extradural hemorrhages are more likely in men. Due to their higher risk of assault and traffic accidents, extradural bleeding occurs more frequently in men and younger people. Research was carried out by Wang et al., in Emergency Department at McMaster University, Canada from January 2004 to June 2006 in patients with age who are at least 18 years old and have not experienced trauma. The main purpose of the study was to look at computed tomography pictures to figure out the indicators of clinically significant atypical outcome in patients who came at emergency department of the hospital who had not suffered trauma. Out of 29469 consecutive head CT images, only 3967 were able to qualify for this research. Among them, 548 revealed clinically important abnormalities which makes 13.8%. There were 6 clinical predictors of significant abnormal findings on head CT scans, with the most significant ones being focal neurologic deficit, changed mental status, history of malignancy, nausea/vomiting, and abnormalities in coagulation profile [18]. In contrast, our research revealed that the most common cause to request CT scan was for the patients with headache i.e., 11.4% of the cases. In the other studies, women had a higher prevalence of headaches. However, more men than women had it in our study. Because Pakistan is an under-developed nation and its society is not very wealthy, the populace is under stress. Tension headaches result from persistent stress. Between the years of 2005 and 2015, Razavi-Ratki et al., did a study at Yazd Shahid Rahnemoun Hospital. The study's focus was on incidental CT findings in patients with head injuries. This study's objective was to evaluate how frequently incidental discoveries on CT scans of head trauma patients occurred between 2005 and 2015. The most frequent incidental finding on CT scans that contributed to the study was calcifications, which were discovered in 3.3 percent of cases. Dandy walker malformations were found in 0.02 percent of cases. 1.60 percent of people had sinusitis, 1.20 percent had big cisterna magna, and 1 percent of people showed signs of infarction. The most frequent incidental finding on CT scans that contributed to the study was calcifications, which were discovered in 3.3 percent of cases. Dandy walker malformations were found in 0.02 percent of cases. 1.60 percent of people had sinusitis, 1.20 percent had big cisterna magna, and 1 percent of people showed signs of infarction [19]. In contrast, our study showed that infarction was found in 51 (25.2%) individuals. Infarction was more prevalent in men than in women because women have estrogen and progesterone, two hormones that operate as a protective barrier for them and help to prevent infarction [20]. In a study conducted by Simpson et al., where 4404 computed tomography exams that general practitioners sought between 1999 and 2007, there was a 10.5% positive rate. Among this, 9.1 percent of total of the anomalies were believed to be coincidental in origin, while 1.4% of the CT findings were considered to have aberrations that might be related to headaches [21]. When compared to the research we conducted, headache was the most typical reason for CT scans, accounting for 23 (11.4%) of the 202 (21.6%) patients who had a brain CT. Falls are the second-leading cause of unintended traumatic mortality over all age groups, right behind vehicle accidents [22]. According to all available data in the research conducted by Cooke et al., assaults, falls, and traffic accidents are the primary causes of brain injuries. However, there is wide regional variance, with the percentage of admissions attributable to traffic accidents ranging from 24% in Scotland to 90% in Taiwan [23]. There is further research that link head trauma from falls to brain injury with 29% present in Chicago and 30.5% in Massachusetts [24, 25]. Falls have a substantial impact on the morbidity and mortality of elderly individuals. In a retrospective case study of 318 patients in Massachusetts who were 60 years of age or older, 189 (or 59%) suffered brain injuries as a result of falls [26].

CONCLUSIONS

According to our research, the vast majority of individuals who underwent CT scans had a history of headache and falls and the most frequent observation in the patients was brain atrophy. Other major findings found were sinusitis and infarction.

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Original Article

Effect of Specific Stabilization Exercise Along with Muscle Relaxation Technique to Treat Lumbopelvic Pain During Pregnancy

Bushra Shafiq[1*], Hina Javaid[2], Sajid Mehmood[3], Anam Mahmood[4], Maira Pervez[5]

[1]Physiogic Physiotherapy Clinic, Lahore, Pakistan
[2]IPHC, Institute of physically handicapped children, Lahore, Pakistan
[3]UHS, University of health sciences, Lahore, Pakistan
[4]University of Management and Technology (UMT), School of health sciences, Lahore, Pakistan
[5]AMDC, Akhtar Saeed Medical and dental college, Lahore, Pakistan

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***Corresponding Author:**
Bushra Shafiq
Physiogic physiotherapy clinic, Lahore, Pakistan
Begumtariq923@gmail.com

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ABSTRACT

Pain in lower back area amid pregnancy is a typical gripe among women frequently viewed as an inescapable disadvantage of an ordinary Pregnancy. Spinal Specific Stabilizing Exercises and Progressive Muscle Relaxation Techniques are popular form of physiotherapy management in preventing lumbopelvic pain that limits the activities of daily living in patients during and after gestation period. These Specific Stabilization Exercises strengthen Abdominal and Para spinal muscles, which control Lumbopelvic stability **Objective:** To compare the effects of Specific Stabilizing Exercises and Specific Stabilizing Exercises along with Progressive Muscle Relaxation Technique in prevention and management of Lumbopelvic Pain during pregnancy. **Methods:** 30 women were randomized to six-week workout plan comprising both Particular workout for stabilization and Progressive Muscle Relaxation Techniques in experimental group and 30 were randomized as control group including only the Specific Stabilizing Exercises. Lumbopelvic torment was evaluated on Visual Analog Scale (VAS) of torment force. **Results:** The control and the experimental group were comparable at baseline. The experimental group receiving both exercises showed significant improvement in intensity of perceived pain (p = 0.002) at the termination of 6 weeks' treatment plan in comparison to control group receiving only specific stabilization exercise **Conclusion:** Specific Stabilizing Exercises along with Progressive Muscle Relaxation Technique reduced pain significantly in pregnant women with lumbar and pelvic girdle pain.

INTRODUCTION

Pain in lower back area amid Pregnancy is a typical complain among women, frequently viewed as an inescapable encumbrance of pregnancy. At least 50% of pregnant ladies encounter some sort of Back pain in pregnancy or during their postpartum period [1]. Reason for this Pain in lower back region includes changes in body mechanics like greater pubic symphysis mobility, Hormonal changes like increased concentrations of relaxing, estradiol and progesterone causing joint laxity and other [2]. There had been differences between the terms pelvic girdle pain and pregnancy related low back pain but currently most adhere to the definition of pelvic girdle pain, both of them usually start around 18th week of pregnancy [3]. Pain may delay the mother's return to activities of daily life. It may last up to 2 years in 20-80% of women after pregnancy. 2 out of 10 women with pregnancy-related LBP become reluctant to conceive again and it accounts for at least 60% of absence from work and approximately 20% of maternity leave [4]. Continuous low back pain is less common among these females, but activities like standing, walking, lying down, sitting, or changing positions can become painful with greater

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difficulty in walking fast and over long distance [5]. Thus, females with pelvic girdle pain avoid activities, this long run idleness leads to muscular weakness and to deconditioning, which in turn predisposes to loss of function and pain, consequently affecting their lives significantly and thus becoming the most well-known reason for debilitated leave after child birth too [6]. Physiotherapy and specific exercise programs can be beneficial through reduction in the severity of acute exacerbations correction underlying mechanical adaptations and deficits. Targeted exercises promote strength of the gluteal and adductor muscles in conjunction with reduction of the activity of lumbar spine musculature. Physiotherapists can also help prevent aggravation of symptoms by reducing the impact of unavoidable activities of daily life [7]. As the pelvis transfers load from trunk to the legs, for effective transmission of loads and minimize shear forces pelvis needs to be stabilized. Stabilization of Lumber and Pelvis can be achieved by Specific Stabilization exercises which can improve the strength and function of the muscles [8]. These Specific Stabilization Exercises improve motor pattern and recruitment pattern of local stabilizing muscles thus changing the load pattern through the pelvis [9]. The isometric tightening of Abdominal muscles such as transverse abdominus effectively improves pelvic floor muscles activity in postpartum females [10]. Pelvic tilt exercises effectively tighten ligaments and muscles supporting the internal organs, decreases tension, improve posture, circulation, and thus decrease low back pain in postpartum females [11]. Stabilization can be achieved through stability ball exercises as it is proven to be effective in reducing low back pain and boost daily life functions in post-partum females [12]. Progressive muscle relaxation is a form of complementary and alternative medicine used to induced relaxation in pregnancy related low back pain it leads to both physiological and psychological effects thereby reducing pain sensation. This technique involves Deep Breathing and Progressive Relaxation of 3 major muscle groups (Lower Limb, Abdomen, and Chest, Arms, Shoulder, Neck and Face) by first contracting and then releasing for at least 20 minutes [13]. These techniques increase a woman's ability to cope up with the stress and problems related to back pain as well as reduce oxygen consumption, respiratory rate, metabolic rate, muscular tension, systolic blood pressure and improves immunity [14-15]. Low Back ache that is associated with pregnancy is a typical issue inducing lower functional ability, quality of life and disability. Physiotherapy intervention is significantly important in reducing Low Back ache in Pregnancy. There is a literature gap regarding effect of "Specific Stabilizing Exercises in conjunction with Progressive Muscle Relaxation Technique. Therefore, this study will help to understand and apply combine effect of these Interventions practically in Pakistan. It will provide an opportunity to share professional experience with the persons of community for the better care of Obstetric patients. The outcomes of study will be a great contribution to maternal health care system of the country and it will be of great value for new researchers.

METHODS

A randomized controlled study was conducted, and data was collected from Antenatal Care Departments of different Hospitals in Lahore. 60 Patients aged between 20 - 40 years were enrolled in the study. All the patients were assessed for the outcome of different back pain and its nature. Visual Analogue Scale (VAS) scoring 0-10 was used to assess the severity of back pain. Back pain was caused by performing provocation (P4 test) for posterior pelvic pain as it increased pressure on SI joint [16]. After completing the Questionnaire, the patients were divided into controlled and experimental group performing only specific stabilization exercises (Pelvic Tilts and isometric contractions of Transverse Abdominis) and stabilization exercises along with muscle relaxation technique respectively. Severity of pain was noted at 2nd, 4th and 6th week on Visual Analog Scale.

RESULTS

The experimental group receiving both exercises showed significant improvement in intensity of perceived pain ($p = 0.002$) at the end of 6 weeks of treatment plan as compared to controls receiving only specific stabilization exercises. Table 1 shows that all the other variables in the questionnaire among socio-demographic and obstetric data showed no statistical difference with the p-value > 0.05. Hence, these are independent of the treatment option used except the Number of trimesters in which pain starts that is dependent of the treatment option used.

Characteristics	Experimental group n (%) n= 30	Control group n (%) n=30	p-value
	Age (years)		
20-25	16 (53.3)	16 (53.3)	0.565
26-30	11(36.6)	11(36.6)	
31-35	3(10)	3(10)	
	Socioeconomic Status		
Upper	1(3.3)	1(3.3)	0.486
Middle	20(66.7)	15(50)	
Lower	9(30)	14(46.7)	
	Gravidity		
1	2(6.7)	1(3.3)	0.098
2	12(40)	8(26.7)	
>2	16(53.3)	21(70)	
	No. of Children		
1st	3(10)	4(13.3)	0.387
2nd	12(40)	6(20)	

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3rd	15(50)	20(66.7)	
Blood Pressure			
High	7(23.3)	5(16.7)	0.253
Low	23(76.7)	25(83.3)	
Occupational level			
Housewife	26(86.7)	23(76.7)	0.587
Working	4(13.3)	7(23.3)	
Onset of Pain			
1st trimester	14(46.7)	12(40)	0.443
2nd trimester	16(53.3)	18(60)	
Nature of Pain			
Shooting	17(56.7)	16(53.3)	0.389
Burning	1(3.3) 1	0(0)	
Dull ache	2(40)	14(46.7)	
Previous physical therapy treatment			
Yes	3(10)	2(6.7)	0.279
No	27(90)	28(93.3)	

Table 1: Socio-demographic and obstetric characteristics of women enrolled in a Study of specific stabilization

exercises along with progressive muscle relaxation to Treat low back pain. All the 60 patients first consulted gynecologist as the pain started and were satisfied when consulted the physical therapist. Table 2 shows the pain intensity of all the women in both groups that was measured at the VAS before the treatment started, then at the 2nd week, 4th week and 6th week of study. Initially there was no significant statistical difference between the VAS scores linked with lumbopelvic pain between the two groups. At the end of 6th week the experimental group experienced the reduction in pain score and the difference was statistically significant (F=92.859; df=3; p=0.002) as compare to the control group (Table 2). The results of this research have shown major improvement in the low back pain of the pregnant women treated with combined exercise plan.

Pain assessment on VAS		Study groups: Group A (experimental group)	Study groups: Group B (control group)	Total	p-value
Before treatment	Mild (1-2)	1	0	1	P=0.220.
	Moderate (3-5)	5	10	15	
	Severe (6-9)	24	20	44	
At 2 weeks	Mild (1-2)	2	1	3	P=0.203
	Moderate (3-5)	23	18	41	
	Severe (6-9)	5	11	16	
At 4 weeks	None	1	0	1	P=0.514
	Mild (1-2)	12	10	22	
	Moderate (3-5)	17	19	36	
	Severe (6-9)	0	1	1	
At 6 weeks	None	11	0	11	p= 0.002
	Mild (1-2)	15	20	35	
	Moderate (3-5)	4	8	12	
	Severe (6-9)	0	2	2	

Table 2: Pain assessment on Visual analog scale (VAS) pretreatment and at 2 weeks, 4 weeks and 6 weeks post treatment

DISCUSSION

The fundamental goal of this study was to determine the effective relation of the Specific Stabilizing Exercises (sitting pelvic tilts and isometric tightening of the muscles of abdomen) along with Progressive muscle Relaxation for prevention and treatment of lower backache associated with Pregnancy. Mean age of the participants was 25.57 ± 3.985, so most of the females were of the age between 20 to 30 years. Pain intensity totals were analogous amid the units at the start of research which were similar to those stated in the previous researches [13]. When combined exercise interventions including Specific Stabilizing Exercises and Progressive Muscle Relaxation were applied, a substantial alteration in pain intensity score was seen amongst the two groups. It was also seen that the Experimental group, which received both therapeutic exercises and practiced them regularly, experienced significant improvement in perceived pain. Former researches showed management plans including only Particular Stabilization exercises during pregnancy which were also found to be effective. The results of this study were different from that performed by J.Kluge et al [6] and Akmes et al [13] regarding interventions i.e. Specific Stabilizing along with Progressive Muscle relaxation. The treatment protocol in our study focused mainly on combined effects of Stabilization and Relaxation I.e. Pelvic tilts and "Transversus Abdominis" strengthening, which lead to the stability of Lumber Spine and significantly reduce laxity of Sacroiliac Joint [17], While muscle relaxation decreased stress hormones, increase endorphins, improve circulation and inhibit sympathetic nerves by blocking the feedback pathway to the brain [18]. Thus, Specific Stabilization and Progressive Muscle Relaxation induced reduction in perception of pain at Visual Analogue Scale (VAS), as shown in a previous study [19]. In a systemic review of non-specific ache in lower back, it was described that stabilization exercises alone or in addition to other therapy, lessened ache [20].

CONCLUSIONS

Although all the patients who participated were satisfied of physical therapy treatment but the application of both the exercises can improve quality of life of pregnant women. As all the patients first visited gynecologists when the pain started so there is need of physical therapy awareness among such patients. The gynecologists can also play a better role in this regard by referring patients to the physical therapy department. The physiotherapists can have better results if they use combine exercise plan to manage lower back pain amid pregnancy.

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Original Article

Factors That Affect the Performance of Undergraduate Nursing Students of Khyber Pukhtankhwa Pakistan

Afrooz Bibi[1], Sohni[1], Aziz-ur-Rehman[2], Fayaz Ahmed[1], Naveed Iqbal[3] and Amir Sultan[1*]

[1]Nursing department, Saidu Group of Teaching Hospital, KPK, Pakistan
[2]Northwest College of Nursing, Peshawar, Pakistan
[3]Nursing department, ZKS THQ Matta Hospital, Swat, KPK, Pakistan

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***Corresponding Author:**

Amir Sultan
Nursing department, Saidu Group of Teaching Hospital, KPK, Pakistan
amirsultan204@gmail.com

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ABSTRACT

Nursing education is the combination of clinical skills and theoretical knowledge. The nursing institutes prepare students for the future as part of the workforce or leaders where they will represent their college or university in clinical practice or in teaching. **Objective:** To identify the factors that affect the performance of nursing students of KPK. **Methods:** The study was conducted in the public and private nursing institutes of KPK Pakistan from June 2022 to July 2022 having a sample size of 120 using a cross-sectional descriptive design and a non-probability sampling technique through adopted questionnaire. **Results:** The male participants of the study were higher (72%) than female (28%) participants. The mean and standard deviation score among all the categories the score of teacher related issues were high (3.26 ± 0.70), followed by the mean and standard deviation score of institute related issues (3.00 ± 0.82), study related issues (2.97 ± 0.76), while home related issues were (2.94 ± 0.67), and personal related issues (2.86 ± 0.96). **Conclusions:** The study concluded based on the finding that out of the basic 5 factors, teachers-related factors including the teacher's subject-matter expertise, the use of audiovisuals inappropriately and the number of topics covered in a single class have the greatest impact on students' performance.

INTRODUCTION

Globally, nursing is considered the backbone of the health care industry, but in Pakistan it doesn't get proper respect and recognition [1]. In 2019, the president of Pakistan, Dr. Arif alvi declared that "2019 is the year of nurses" to highlight their role and importance in the health sector. The nursing profession boomed all over the country, but especially in Khyber Pukhtankhwa, where nursing became the fastest growing profession with the help of regulatory bodies and academic authorities. Currently in Khyber Pukhtankhwa, there are 92 registered nursing colleges, most of which opened in the last 5 years. Nursing education is the combination of clinical skills and theoretical knowledge [2]. Furthermore, it is the foundation of research, practice and theory [3]. The nursing institutes prepare students for the future as part of the workforce or leaders where they will represent their college or university in clinical practice or in teaching. Questions arose that nursing institutes are increasing in quantity, as their quality will be compromised? Nursing students are the strength of any university or educational system where they receive their academic sessions. Academic performance refers to a student's competency in managing their studies as well as how they carry out the numerous activities that have been allocated to them by their teachers [4]. Nursing institutes prepare the best nursing graduates, who are assessed for their academic performance by any organization during

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hiring. Students must make an effort in their educational career in order to get good grades and prepare themselves for future professional opportunities while also meeting the demands of the employer [5]. The future of the nursing profession strongly relies on whether colleges offer education programmes that prepare students with adequate levels of intellectual and clinical capability [6]. The academic performance of nursing students has a direct impact on the background from where the students have received their education and their entrance examination [4]. Many studies show that nursing students face a lot of problems during their training, which affect their academic performance. Stomberg and Nilsson (2010), revealed in their study that the teacher's role is very important in the academic performance of nursing students. If a teacher fails to gain the attention of students, the students get lazy [7]. Furthermore, Cerna and Pavliushchenko (2015) stated that teachers are an important factor that contributes to academic achievement performance [8]. Alos et al., highlights that a student's achievement in nursing school is influenced by a variety of elements, including their personal circumstances, study habits, environment at home, and teachers [5]. Hayden et al., (2011) pointed out that good study practices are the key to successful students [9]. While the study of Bratti (2002) showed that the student's future achievement depends on the previous educational outcome of the student [10]. The study conducted by Goodall et al., (2010) found that the guidance and supervision of parents play a vital role in the performance of students, which helps the students to engage in the academic activities further [11]. In his study, Zarei (2008) mentioned that continuous assessment tests among students have a positive association with the academic performance of students [12]. The study conducted by Mushtaq and Khan (2012) shows that internal factors (class, timetable, class size, and facilities) and external factors (homework, family, economic conditions, and social factors) are associated with the performance of students [13]. The aim of the study was to explore the factors that are associated with the academic performance of nursing students.

METHODS

The study was conducted in the public and private nursing institutes of Khyber Pukhtankhwa Pakistan from June 2022 to July 2022 using a cross-sectional descriptive design and a non-probability sampling technique. The population of the study was nursing students who were enrolled in any registered nursing institute in Khyber Pukhtankhwa. The inclusion criteria for the study were nursing students who are currently attending academic sessions and are willing to be participants in the study. Nursing students on clinical duty or on leave were excluded from the study. Data from a sample of 120 students was collected. Before the data collection, the proposal and instrument of the study were submitted for ethical review. As the ethical certificate from the institutional review committee was received, permission was then taken from the faculty of nursing colleges to approach the study population for data collection. An informed consent form was created for the participants, who stated that their data would be kept confidential, the students would not profit directly from the project, the student have the right to leave the study anytime, and the data would only be used for data analysis. The tool used for the study was an adopted questionnaire, which contains two parts. Part A contains gender, age, living status, and year of program. Part B contains five categories (36 items), each having a 5-point Likert scale. 1-no impact, 2-very low impact, 3-low impact, 4-high impact, and 5-very high impact). A set of cutoff values are established, which include:

- No impact (mean score of 1.0–1.7)
- Very low impact (mean score of 1.8-2.5)
- Low impact (mean score of 2.6–3.3)
- High impact (mean score of 3.4 to 4.1)
- Very high impact (mean score of 4.2 to 5)

The validity of the questionnaire was checked by 2 nursing experts, and reliability was checked through a pilot study on 12 students, which showed a chronbach alpha of 0.81. A questionnaire with a consent form was distributed among nursing students in the presence of faculty members of the concerned nursing institute. The questionnaire was explained to students, and those students who had any queries were explained at the movement.

RESULTS

The total participants of the project were 120, among the participants majority of the participants were male n=87 (72%), and females were n=33 (28%). The students having age (23 – 27 years) were in majority (65%), followed by the age group (18 – 22 years) (32%), and the age group (28 – 31 years) were only (3%). Students of 4th year (semester 7 and 8) were the major group (72%), then 3rd year students (17%) and 2nd year students were (10%). The students living in rural area were (59%) more than the students living in urban areas (41%) (Table 1).

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Characteristics		Frequency
Gender	Male	87
	Female	33
Age	18 -22 years	38
	23 – 27 years	78
	28 – 31 years	4
Year of BSN	1st year (1st and 2nd semester)	1
	2nd year (3rd and 4th semester)3	12
	rd year (5th and 6th semester)	21
	4th year (7th and 8th semester)	86
Living	Urban	49
	Rural	71

Table 1: Demographic Data

The questionnaire was divided into 5 major categories, personal issues, study habits, home related issues, institute related issues and teacher related issues. The responses of the students were labeled in major categories based on the mean score of cutoff values (Table 2). The responses of the students showed that study related issues and teacher related issues has high impact and the major contributor that affect the performance of nursing students.

Personal related issues		Major category	Mean score
1	Feeling sleepy in class	Low impact	2.88
2	Feeling hungry in class	Low impact	2.9
3	Difficulty in seeing	Low impact	2.79
4	Difficulty in hearing	Low impact	3.1
5	Difficulty in breathing	Low impact	2.68
Study related issues			
1	I study only when there is a quiz	Low impact	3.05
2	I feel tired, bored and sleepy	Low impact	2.88
3	I prefer listening to radio, watching TV, etc.	Low impact	2.9
4	I am lazy to study.	Low impact	3.5
5	I am disturbed when studying.	Low impact	2.8
6	I have no time to study at home.	Low impact	2.8
7	I study only when I like.	Low impact	3
8	I don't have a comfortable place to study	Low impact	3
9	I copy the assignments of friends	Low impact	2.8
Homes related issues			
1	I live far from school.	Low impact	3.3
2	I live near the school.	Very Low impact	2.58
3	I don't live with my parents.	Low impact	2.87
4	Both my parents are working.	Low impact	3
5	I do too much households.	Low impact	2.93
6	I have many brothers and sisters	Low impact	3
Institute related factors			
1	The time schedule is followed.	Low impact	3.2
2	There are school programs.	Low impact	2.97
3	There are available library references.	Low impact	3.2
4	Classroom is comfortable enough.	Low impact	3.13
5	There is fast internet access in the library.	Low impact	2.8
6	There is enough space in the library.	Low impact	2.9
7	Location of classrooms.	Low impact	3
Teacher related factors			
1	Teacher has mastery of the subject matter.	Low impact	3.28
2	Teachers discuss many topics in a short period of time.	High impact	3.5
3	Teacher uses audio/visual aids.	High impact	3.4
4	Teacher gives too much memory work.	High impact	3.4
5	Teacher provides varied activities.	Low impact	3
6	Teacher uses lecture method only.	Low impact	3.3
7	Teacher always warns students.	Low impact	3.3
8	Teacher is frequently out/absent from class.	Low impact	3.1
9	Teacher is always late	Low impact	3.2

Table 2: Factors affect the performance of nursing students

The factors are further distributed to identify the minimum score, maximum score, standard deviation and mean score of each category (see table 3). The mean and standard deviation score among all the categories the score of teacher related issues were high (3.26 ± 0.70), followed by the mean and standard deviation score of institute related issues (3.00 ± 0.82), study related issues (2.97 ± 0.76), while home related issues were (2.94 ± 0.67), and personal related issues (2.86 ± 0.96). Among all the categories they were significant except personal related factors and home related factors with gender (Table 3).

Sr no.	Factors	Mean ± SD	Minimum	Maximum	Sig.
1	Personal related factors	2.86 ± 0.96	1.0	5.0	0.076
2	Study related factors	2.97 ± 0.76	1.33	4.78	0.000
3	Home related factors	2.94 ± 0.67	1.33	4.33	0.060
4	Institute related factors	3.00 ± 0.82	1.29	5.00	0.016
5	Teachers related factors	3.26 ± 0.70	1.78	4.78	0.002

Table 3: Descriptive analysis of the contributing factors

The mean score in personal related issues, study habits, home related issues, institute related issues and teacher related issues is higher among male than female participants (see table 4)

Sr no.	Gender	P-Mean	S-Mean	H-Mean	I-mean	T-mean
1	Male	3.02	3.01	2.99	3.09	3.28
2	Female	2.44	2.89	2.80	2.77	3.21

Table 4: Means score of factors on the bases of gender

DISCUSSION

The purpose of the study was to identify the factors that contribute to the performance of nursing students in Khyber Pukhtankhwa Pakistan. In our study we identified that teachers related issues (mean 3.26) are the major contributor that affect the performance of nursing students. Similarly in a study conducted in Saudi Arabia by Alshammari et al., that teacher related issues with mean score (4.16) were the major factors that affect the performance of students [14]. Teachers are considered as a respected profession all over the world. The issues which rose are in the form of teaching styles, communication gap between students and teacher, many topics it one time,

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inappropriate used of audio visuals, are not command of teacher on the concern subject or topic. The finding of the study is also similar with the results of a study conducted by Alos et al., [5]. The study of Mbugua et al., showed that those teachers who are not well aware about the subject can cause irritation among the students which can compromise their academic performance [15]. Likewise in our study, the major elements that affect the performance of nursing students were teachers. The study finding has different finding with the study conducted by Elsabagh et al., where teachers related issues were of mean score (2.92), 3rd number among the factors that affect students' performance [4], but the study conducted by Bangbade et al., showed that teacher related issues has a high significance on performance of students [16]. Sunshine et al., also pointed that teacher are the most important category which influenced the performance of students [17]. Teacher who are experienced make bond with the students, therefore students openly discuss question and issues with the teachers which enhance the base of students and promote a well trusted relationship. Institute related issues also has a great impact on the performance of students, but in this study the students mean score (3.00) showed that it is the 2nd big problem after teacher related issues. Usaini et al., identified that the learning facility provided inside the institute should be satisfactory and the technology of the facilities should be up to date for the students without any deficiency that they feel like home [18]. Ali et al., stressed that all the required facilities of the institute put positive impression on the students which increase the potential of the students and that are assessed through their performance [19]. This study identified that the overall mean score of personal issues is low compared to other factors, but the indicator of difficulty in seeing and hunger within the class and becoming sleepy has a mean score of 3.1, 2.9, and 2.88, which means that large number of students within the class face difficulty in seeing the white board and multimedia. In the study of Elsabagh et al., the highest mean score among the personal factors were of the students feeling sleepy [4], while the result of study conducted by Fredriksen et al., shows that low grades and low self-esteem become more common in students that feel sleepy in class due to lack of sleep in home which leads the students towards depression [20]. In this study the lowest mean score among the factors were the score of personal issues (2.86) then the 2nd lowest score was the score of home related issues (2.94). Similarly, a study conducted in Saudi Arabia, the lowest mean score among the factors were house related factors that were (3.54)[15]. In current study, the mean score of students within the category of study habits is 3rd that affect students, but the indicator within the study habits showed that the mean score of students studies only for quiz. The finding of our study is similar with the finding of study conducted by Elsabagh et al., which has the highest mean score (3.35) of students who study at the time of quiz only [4]. The finding is also similar with other studies that were conducted by Cerna and Pavliushchenko who showed that high performing students study only alone [8]. Kornell and Bjork's study also showed that students only attend maximum grades who attend one quiz before exam [21].

CONCLUSIONS

According to the study's findings, out of the fundamental 5 elements, teachers' associated factors—which include a teacher's subject-matter expertise, inappropriate audiovisual use, and a variety of topics covered in a single class—affect students' performance the most. Personal difficulties, such as viewing the board and other multimedia, affect nursing students as well as personal, home-related, and work-related issues. This should be noted by the institute for the best performance of their students.

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Original Article

Comparing Effectiveness of Median Nerve Mobilization with and without Transverse Carpal Ligament Stretching in Patients with Carpal Tunnel Syndrome

Sidrah Shabbir[1*], Ayesha Rasheed[3], Asma Ayyaz[2], Yumna Rasheed[3] and Amna Saleem[3]

[1]Akhtar Saeed College of Rehabilitation Sciences, Lahore, Pakistan
[2]Department of physiotherapy, Akhtar Saeed Trust Teaching Hospital, Lahore, Pakistan
[3]Department of Physiotherapy, Akhtar Saeed College of Rehabilitation Sciences, Lahore, Pakistan

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***Corresponding Author:**

Sidrah Shabbir
Akhtar Saeed College of Rehabilitation Sciences, Lahore, Pakistan
sidrah_huma@hotmail.com

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ABSTRACT

Carpal tunnel is the narrow space which is present between smaller bones of hand and an important ligament of hand which is called transverse carpal ligament. Compression of median nerve occurs commonly at wrist which results in Carpal Tunnel Syndrome (CTS). **Objective:** To compare effectiveness of median nerve mobilization with and without transverse carpal ligament stretching in patients with carpal tunnel syndrome. **Methods:** In this study, 34 patients were randomly assigned into one of two groups, each with 17 individuals. For two weeks, group B received a combination therapy strategy of Neurodynamics and transverse carpal ligament stretching, while group A only received neurodynamics. After two weeks, there was an improvement in functioning and pain. The DASH questioner and VAS were filled at baseline. The current RCT was conducted at the Akhtar Saeed Trust Hospital in Lahore. SPSS was used to conduct the analysis. **Results:** In the present study of 34 patients independent sample t test was applied as the mean difference was less in group B, which used a combination treatment method of transverse carpal ligament stretching and neurodynamics, compared to group A, which used only neurodynamics. The p value is less than 0.05, indicating that the results were significant. In comparison to group A, results of group B in which combined treatment approach was applied found to be more substantial and superior. **Conclusions:** Group B, which included both neurodynamics and transverse carpal ligament stretching, was shown to be more effective than group A, which solely used neurodynamics.

INTRODUCTION

Carpal tunnel is the narrow space which is present between smaller bones of hand and an important ligament of hand which is called transverse carpal ligament. Compression of median nerve occurs commonly at wrist which results in Carpal Tunnel Syndrome (CTS) [1-3]. It causes motor and sensory changes as a result of any pressure and over stretching of the median nerve as it passes through the narrow space in the wrist [4-6]. Median nerve mobility can also be restricted if the space of carpal tunnel decreases and contents of carpal tunnel enlarges [7,8]. This results in the neurological symptoms that can travel down the wrist along the median nerve distribution [9,10]. CTS can be classified into 3 grades such as mild, moderate, and severe CTS. Mild and moderate CTS patients present with numbness and paresthesia in hand fingers but wrist functions are not affected but in severe CTS wrist activities are restricted. Its incidence rate is 1 % and age ranges from 40 to 60. Its prevalence is more in females as compare to males. Prevalence of this syndrome in US population is 3.72 percent and its incidence is 139.4 females out of 100 000 and 67.2 males out of 100 000 [11]. There are many causes for this syndrome such as metabolic diseases, tendinitis, tendinosis, repetitive wrist activities, gripping activities, constant pressure over median nerve, fracture of carpal bones, poor posture, lesions of median nerve, any trauma, arthritic changes and pregnancy but many have idiopathic

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cause [12-14]. The most common characteristics is tenderness and pain especially at night [15,16]. There is decrease in pain and numbness after flicking the wrist [17,18]. The pain is limited to median nerve distribution as it can spread to forearm and shoulder [19,20]. Delay in treatment can result in permanent change such as sensory loss and muscle atrophy of Thenar muscles. This can result in limitation of activities of daily life as there is weakness and atrophy of muscles innervation by median nerve [17,21]. Phalen's test and Tinel's sign is positive in this syndrome [11]. Different treatment plans are given to patients in physiotherapy in order to protect the nerve wrist splint is used which keeps the wrist in neutral position [22]. It is advised to use wrist splint at night as symptoms are more severe at night and it can be added along with conservative treatment. It is mentioned that wrist splint decreases the symptoms in 67 percent. TENS, laser, stretching exercises, cryotherapy, PNF techniques, Ultrasound therapy, tendon glides, nerve stretching exercises, carpal bones mobilization techniques, traction exercises and strength training can also be used [23]. There are different techniques of nerve mobilization which includes nerve tension exercises and nerve glides. These treatments can result in decrease in pain, numbness, strength improvement and ROM improvement. Tendon glides prevents adhesion formation and compression in carpal tunnel [24]. Kinesio taping can also be used for same purpose. When conservative treatment fails surgery is recommended in severe cases but there can be surgery related complications and failure [25]. Nonsurgical treatment also includes NSAIDs and Steroids [12,26,27]. There is very limited literature which tells us about combined effect of splint along neurodynamics so present study showed that combined intervention is more effective as compared to neurodymics alone.

METHODS

In present study, 34 patients were chosen and separated into two groups, with each group containing 17 patients, using the Randomization Concealment method and random convenient sampling. The research was conducted at the Akhtar Saeed Trust Hospital's Department of Physiotherapy. The second group had a combined neurodynamics and carpal ligament stretching treatment, whereas the first group received solely neurodynamics (distal nerve tension technique and nerve slide) treatment. The hand is positioned in six postures for the Median Nerve Tension Technique. The first position consists of a neutral wrist with flexed fingers, the second position consists of finger extension with the wrist in a neutral position, the third position consists of wrist extension with finger extension, the fourth position consists of thumb extension, the fifth position consists of forearm supination, and the sixth position consists of slight thumb tension. Five repetitions were completed, with each position held for seven seconds. Wrist extension and finger flexion are used in the nerve slide technique, and vice versa. When the wrist extends, the elbow flexes, and vice versa. 10 repetitions were done during a two-week period, 5 days per week. Patients with signs and symptoms of CTS, having discomfort and paresthesia, as well as positive Tinel and Phalen tests, were included. Symptoms of patients that lasted at least for four weeks were included. Patients with a history of surgery, who were more than 50 years old, who had been in a car accident, who were pregnant, who had received corticosteroid injections, and who had a systemic condition were all eliminated. The DASH determines the functional restriction. The subjects completed this questionnaire before beginning treatment and again after finishing treatment. Patients were observed for two weeks and treated five days a week for a total of ten sessions. After a two-week period, a comparison of outcomes was made. After completing out the questionnaires, the data was analyzed using SPSS. In the study, the P value of 0.05 was indicated and considered significant.

RESULTS

34 patients were taken in this study in which group A has the mean age of 46.00+4.16 years and group B has the mean age of 45.59+4.47 years. In group A 5 males and 12 females were present while in group B 6 males and 11 females were present. It was concluded that CTS is more prevalent in females as compared to males. In group A 11 married and 6 unmarried were present and in group B 9 married and 8 unmarried were present.14 patients in group A developed CTS in right hand and 3 in left hand while 13 patients in group B developed CTS in right hand and 4 in left hand. As in group B when mean paired difference was seen it was lesser in group B in which combined treatment approach was used as compared to Group A in which only neurodymics were used so second group of neurodymics and transverse ligament stretching found to be more superior as compared to first group in which only neurodynamics alone were used. Through independent sample t test baselines values for DASH were insignificant in both groups ($P>0.05$). In the end of 2 weeks' treatment, there was significant difference in both groups but group B results were found to be more significant as compared to group A as $p<0.05$. Baseline values for VAS were insignificant as $p>0.05$ but after two weeks' duration significant results were found in both groups but more significant results were found in second group as compared to first group. It was concluded that Group B in which neurodynamics and carpal ligament stretching were used found to be more effective as compared to group A in which only neurodynamics were used. In group A mean age was 45.7+ 4.28 and in group B

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mean age was 34.06 + 4.35, Table 1.

Age	N	Mean±SD (Years)
Group A	17	46.00±4.16
Group B	17	45.59±4.47

Table I: Age of participants in Group A and Group B

In group A 5 males and 12 females were present while in group B 6 males and 11 females were present. It was concluded that CTS is more prevalent in females as compared to males. In group A 11 married and 6 unmarried were present and in group B 9 married and 8 unmarried were present.14 patients in group A developed CTS in right hand and 3 in left hand while 13 patients in group B developed CTS in right hand and 4 in left hand, Table 2.

Variable	Group	Attribute	N	Total
Gender	Group A	Male	5	17
		Female	12	
	Group B	Male	6	17
		Female	11	
Marital status	Group A	Married	11	17
		Unmarried	6	
	Group B	Married	9	17
		Unmarried	8	
Hand involvement	Group A	Right hand	14	17
		Left hand	3	
	Group B	Right hand	13	17
		Left hand	4	

Table 2: Demographics of Group A and Group B

pretreatment values of DASH questioner were insignificant among two groups (p=0.38) but after follow up period when interventions were given, significant difference was found with p value 0.00 which falls under p <0.05. Group B in which neurodynamics and transverse carpal ligament stretching were used found to be more effective as compared to group A in which only neurodynamics were used, Table 3.

Study Group		Mean±SD	N	S. E	Mean difference	T	Sig.
DASH-baseline	Group A	86.41±5.00	17	1.21	-1.35	-0.88	0.38
	Group B	87.76±3.89	17	0.94			
DASH-post	Group A	19.00±9.98	17	2.42	7.82	2.84	0.00
	Group B	11.17±5.34	17	1.29			

Table 3: An independent sample t-test demonstrating the significance of the difference between groups A and B as n=34

Pretreatment values of VAS scale varied insignificantly with p=0.17 but after follow up period when interventions were given, there was significant difference between two groups with p value 0.01 which falls under p <0.05. Group B in which neurodynamics and carpal ligament stretching were used found to be more effective as compared to group A in which only neurodynamics was used, Table 4.

Study Group		N	Mean±SD	p-value (**)
Baseline	Group A	17	8.58±1.00	0.17
	Group B	17	9.05±0.96	
Week_2	Group A	17	1.29±0.46	0.01
	Group B	17	1.00±0.00	

Table 4: Independent sample t-test demonstrating significance of difference between group A and B as n=34

DISCUSSION

In the past Wolny and Linek 2019 did a study in which 103 patients were enrolled. There were two groups. First group received neurodynamics alone and the second group received neurodynamics together with traditional physical therapy. In previous study the second group that received neurodynamics and traditional physical therapy found to be more effective than the first group of neurodynamics alone. Treatment was given twice a week for a total of 20 sessions. Similarly, when previous study was compared with present study it was seen that combined interventions such as neurodynamics and transverse carpal ligament stretching were found to be more effective as compared to first group that received only neurodynamics [28]. Previously, there was a study conducted by Goyal, Mehta, and colleagues in 2016. The first group received traditional physiotherapy, whereas the second group received procedures for neural nerve mobilization. Each group consisted of 15 patients. Finally, it was determined that the group that incorporated neural nerve mobilization was more effective than the other group. Similarly, in the present study the group that incorporated neural nerve mobilization was found to be more effective [29]. In the past De-la-Llave-Rincon and Ortega-Santiago conducted a study on 18 CTS patients. The researchers wanted to see how soft tissue technique and neurodynamics affected pain and pressure sensitivity. Scalene neck muscle, elbow aponeurosis (bicipital aponeurosis), pronator teres, and hand ligaments were all subjected to soft tissue mobilization (transverse carpal ligament). Finally, it was discovered that while neurodynamics and soft tissue massage reduce pain, they do not reduce pressure sensitivity. Likewise, in present study it was found that neurodynamics and transverse carpal ligament stretching reduces tenderness in CTS [11].When previous studies were compared with present study same results were found as it was seen that the outcomes in the current study were significant in both groups, however group A, which used a ligament stretching as well as neurodynamics, was shown to be more significant than group B, which used simply neurodynamics in other words combined treatment approach was found to be more effective.

CONCLUSIONS

The researchers concluded that while both groups' results

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were significant, the combined therapy technique (neurodynamics and carpal ligament stretching) was superior to neurodynamics alone. Pain was reduced and functional strength was improved more in Group B. When comparing the two groups, it was discovered that group B produced more significant results than the group A.

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Original Article

Hypogonadism in Benign Prostate Hyperplasia: A Cross Sectional Study

Ismail Khan[1], Malik Aftab Younus[2], Mohammad Shoaib[1], Muhammad Haris[3*], Noman Ullah Wazir[1], Muhammad Jehangir Khan[4], Sobia Haris[5] and Farah Deeba[5]

[1]Department of Urology, Peshawar Medical College, Peshawar, Pakistan
[2]Department of Urology, Fazaia Ruth Pfau Medical College, Karachi, Pakistan
[3]Department of Anatomy, Nowshera Medical College, Nowshera, Pakistan
[4]Department of Pediatric Surgery, Makka Medical Center, Nowshera, Pakistan
[5]Department of Medical Education, Nowshera Medical College, Nowshera, Pakistan

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***Corresponding Author:**
Muhammad Haris
Department of Anatomy, Nowshera Medical College, Nowshera, Pakistan
dx_harris@hotmail.com

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ABSTRACT

Benign prostatic hyperplasia is a common health problem affecting men older than 50 years. It is estimated that 30 million men have benign prostatic hyperplasia related clinical features **Objective:** The objective of this study was to find out the relationship between hypogonadism in patients presenting with benign prostate hyperplasia at tertiary care center. **Methods:** A descriptive cross-sectional study conducted at Urology Department Lady Reading Hospital Peshawar for a period of one year from June 2019 to May 2020. A total of 361 patients with benign prostate hyperplasia were studied. The sampling technique was consecutive non probability sampling and WHO sample size calculator was used for sample size determination. Serum testosterone level was done all patients as per inclusion criteria. All the data was analyzed in SPSS version 20.0. **Results:** The mean age, height weight, BMI and testosterone level of qualitative variables were 56.42±10.05, 167.54±9.97, 64.96±12.92, 23.07±4.96 and 15.36±6.36 respectively. The testosterone level decreased with ageing in different age groups. 29.6% patients of our study were 50-59 years old. The hypertensive and diabetic patients with BPH were 31.3% and 22.4% respectively. Out of 361 patients 67 were hypo gonadal men making 18.6%. The hypogonadism had statistically significant mean values of serum testosterone level ($p<0.001$). **Conclusions:** This study concluded on the analytical findings that hypogonadism is significantly associated with benign prostate hyperplasia. The testosterone levels decrease with the increase of age and thus patients with low testosterones are more prone to develop benign prostate hyperplasia.

INTRODUCTION

Benign prostatic hyperplasia is a common health problem affecting men older than 50 years. It is estimated that 30 million men have benign prostatic hyperplasia related clinical features [1]. The prostatic hyperplasia is associated with the age related hormonal changes and changes in the prostatic epithelial and stromal compartments with ageing. The testosterone level is decreased with the age and the risk of BPH development increases [2]. Other factors associated with the development of BPH are hyperinsulinemia, metabolic syndrome and insulin like growth factors [3]. It is suggested that hyperinsulinemia is related to the BPH due to the fact that patients with BPH has higher levels of insulin early morning shown by different studies. This high insulin level is also related to the metabolic syndrome as well [4]. Hypogonadism is associated with benign prostate hyperplasia. Different studies have shown that patients with benign prostate hyperplasia have more frequency of hypogonadism than those who have normal prostate. The prevalence of hypocorism in normal population ranges from 2 to 12.8 % [5]. while the prevalence of hypogonadism in patients with benign prostate hyperplasia is 16.2% [6]. The effect of testosterone on prostate and its size is still unknown. The dihydro testosterone, an active metabolite

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of the testosterone in the prostate is responsible for the activation of an androgen receptor results in the enlargement of prostate. The is enzymes 5 reductase type 1 and type 2 help in the conversion of testosterone in the prostate to the dihydro testosterone [7]. The drugs finasteride and dutasteride are 5 reductase inhibitors block the 5 reductase and thus reduce the prostate volume by 25% in enlarged prostate and help in the reduction of lower urinary tracts symptoms. It is also a well known that decreasing the testosterone level in patients with prostate carcinoma will decrease the size of the prostate i.e. castration in the prostate carcinoma will decrease the size of the prostate [8,9]. The FDA warned all the manufacturing companies of testosterone saying that patient with BPH should not be treated with testosterone therapy for hypogonadism because it "increases the risk of worsening signs and symptoms of BPH" [10]. The risk of BPH increases with the use of testosterone therapy for hypogonadism in men and therefore such treatment is contraindicated in patients with benign prostate hyperplasia [11]. The controversies about the testosterone therapy still exist and no convincing data is available suggesting the risk of Ca prostate by using testosterone therapy [12]. In a study by Wang C et al showed that there is no affect of testosterone therapy on the prostate size and volume [13]. Keeping in mind all the controversies about the testosterone and benign prostatic hyperplasia it pushed me to study the association of testosterone level in patients with begin prostate hyperplasia. The hypogonadism in patients with benign prostate hyperplasia will lead us to know its prevalence and thus will help us the management of hypogonadism related to the BPH.

METHODS

This descriptive cross sectional study was conducted at Department of Urology, PGMI Lady Reading Hospital Peshawar, Pakistan from June 2019 to May 2020 for duration of one year. The sample size was 361, keeping 16.2% proportion of hypogonadism among patients with benign prostate hyperplasia, 99% confidence interval, 5% margin error using WHO sample size calculator. The sampling technique was consecutive non probability sampling. All the patients presenting with benign prostate hyperplasia diagnosed on the basis of digital rectal examination and ultrasonography with age 30 to 90 years, included in the study and patients with known case of Ca prostate, known case of hypogonadism, history of hernia, varicocele or using testosterone therapy were excluded. Exclusion criteria were strictly followed to control the confounders and to exclude bias in the study results. After permission from hospital ethical committee and taking consent from patients included in the study, 3 ml of blood was taken from all the patients presented with benign prostate hyperplasia and was sent to hospital laboratory for the detection of testosterone levels. All the investigations were done in same laboratory by a technician having experience of more than five years. All the data like age, height weight, BMI, duration of BPH, hypogonadism, testosterone levels, diabetes and hypertension were recorded in a pre-designed proforma. All the data was analyzed in SPSS version 20. Mean and standard deviation was calculated for numerical variables and frequencies and percentages were calculated for qualitative variables. Independent t test for continuous variables was applied with p value of < 0.05 as significant.

RESULTS

The mean and standard deviation of age, height, weight and BMI were 56.42±10.05, 167.54±9.97, 64.96±12.92, 23.07±4.96 respectively. The mean and standard deviation of testosterone levels was 15.36±6.36 (Table 1).

Variables	N	Mean ± SD
Age (Years)	361	56.42±10.05
Height (cm)	361	167.54±9.97
Weight (Kg)	361	64.96±12.92
BMI (Kg/m2)	361	23.07±4.96
Duration of BPH (Days)	361	5.24±3.34
Testosterone level (nmol/l)	361	15.36±6.36

Table 1: Mean and standard deviation of quantitative variables of patients with BPH

The testosterone level was analyzed in different age groups in patients with BPH. Out of 361 patients with BPH, 107 patients with the age group of 50-59 years had mean ± standard deviation of testosterone15.61±5.61 making 29.6% of all the patients included in the study (Table 2).

Age Group	Mean±SD	N(%)
< 40 years	20.76±5.713	37(10.2%)
40-49 years	19.84±5.348	68(18.8%)
50-59 years	15.61±5.614	107(29.6%)
60-69 years	13.50±4.905	69(19.1%)
70-80 years	10.92±5.035	56(15.5%)
>80 years	8.96±3.884	24(6.6%)
Total	15.36±6.364	361(100.0%)

Table 2: The mean, standard deviation and percentage of age group of Testosterone level (nmol/l) in BPH

Out of 361 patients presented with BPH, 113 patients were hypertensive making 31.3% of all the patients presented with BPH. 81(22.4%) patients were diabetic among all 361 patients with BPH and rests of the 280 were non diabetic. Out of 361 patients presenting with BPH, 67 patients (18.6%) patients had hypogonadism (serum testosterone <12nmol/l) (Table 3).

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Comorbidities in patients with BPH	Frequency(%)
Hypertension absent	248(68.7%)
Hypertension present	113(31.3%)
Diabetes absent	280(77.6%)
Diabetes present	81(22.4%)
Hypogonadism absent (serum testosterone >12nmol/l)	294(81.4%)
Hypogonadism present (serum testosterone >12nmol/l)	67(18.6%)
Total	361(100.0%)

Table 3: Frequency and percentage of Diabetic, Non Diabetic and hypertensive and normotensive and

Hypogonadism in patients with BPH

Patients with hypogonadism had statistically significant mean values of serum testosterone level i.e. 9.58 3.52 (p<0.001)(Table 4).

Hypogonadism	N	Testosterone level (nmol/l)Mean± SD	sig
Hypogonadism absent (serum Testosterone >12nmol/l)	294	16.68±6.13	0.001
Hypogonadism present (serum Testosterone ≤12nmol/l)	67	9.58±3.52	

Table 4: Comparison of Hypogonadism in BPH with serum testosterone(nmol/l)

DISCUSSION

Androgens are believed to be the cause of benign prostate hyperplasia and lower urinary tract symptoms [14,15]. The pathogenesis of benign prostate hyperplasia is still unknown but different studies show different factors involved in the pathogenesis of BPH. Griffiths K et al believe that orchiectomy or suppression of pituitary –testicular axis results in decrease in the prostate volume. Finasteride and Dutaseride are the 5 reductase inhibitors suppress the testosterone levels and thus causing the decrease in the prostate volume [16,17].The androgens are important for the prostate growth so the androgens contribute to the development of lower urinary tract symptoms secondary to the benign prostate hyperplasia [18]. Other studies showed that two main factors involved in the benign prostate hyperplasia are ageing and androgen deficiency. The androgens are essential for the structural and functional integrity of the prostate and any disturbance in the androgen levels in the body results in enlargement of the prostate [19]. With ageing the testosterone level is decreased and the estrogen level is increased. A study by Ho CK et al showed that estrogen is responsible for the development of BPH [20]. The association of testosterone level and benign prostate hyperplasia was studied by many authors. Few authors suggested that increased testosterone level are associated with the enlargement of prostate while other suggested that low testosterone level are the cause of BPH. Joseph et al showed high testosterone level causes the prostate enlargement in African-American population but Meikle et al were of the opinion that there is inverse correlation between the testosterone and BPH saying that low testosterone level in men causes benign prostate hyperplasia [21,22]. Similarly, in the data analysis of this study shows that hypogonadism is significantly associated with benign prostate hyperplasia as shown in the study. Patients with hypogonadism had statistically significant mean values of serum testosterone level i.e. 9.58 3.52 (p<0.001). This study also shows that the testosterone levels are decreasing among the age groups as shown. Obesity and BPH1 are associated with each other reported by different epidemiological studies [23,25]. High BMI is associated with lower urinary tract symptoms and BPH shown in meta analysis while few studies show no relationship of high BMI and BPH [24,26]. In our study the mean BMI was 23.07±4.96 kg/m2 Table 1 showing no significantly positive association with BPH in data analysis. The diabetes and BPH1 reported to be associated with each other in different studies [27,29]. The controversies about BPH remain unsolved as few other studies showed the relationship of hyper insulimnmeia with prostate enlargement [28]. Patients with diabetes have more risk of developing lower urinary tract symptoms. Nandeesha et al showed that insulin level as independent predictor of BPH [30]. In our study 22.4 % patients with BPH were diabetic Table 3 showing no significant relationship between BPH and Diabetes. Hypertension and BPH1 were reported to have positive relationship with each other [31]. The interesting thing between their relationship is both the hypertension and BPH can be treated with 1-adrenoceptor antagonists [32]. Our study showed that 31.3% patients were hypertensive Table 3. As both the BPH and Hypertension are old age diseases so the relationship between them were not analyzed for their correlation. Different studies reported differently about the association of hypogonadism and benign prostate hyperplasia. Our studies focused on the testosterone level in old age and its effects on the prostate. We found that the prevalence of hypogonadism in benign prostate hyperplasia was 18.6% while in a study by Wichendu PN et al the prevalence of hypogonadism in BPH was 16.2% [6].

CONCLUSIONS

Our study concluded on the analytical findings that hypogonadism is significantly associated with benign prostate hyperplasia. The testosterone levels decrease with the increase of age and thus patients with low testosterones are more prone to develop benign prostate hyperplasia.

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Original Article

Incidence of Occult Inguinal Hernia Diagnosed with Ultrasound in Patients with Groin Pain

Muhammad Hashim[1*], Muhammad Uzair[1], Syed Muhammad Yousaf Farooq[1], Muhammad Arslan Haider[1], Babar Hanif[1], Syeda Iman Zahra[1], Hafiza Iman Esha Ali[1], Warda Zahid[1], Ramesha Jamil[1], Seemal Hashmi[1]

[1]University Institute of Radiological Sciences and Medical Imaging Technology, The University of Lahore, Lahore, Pakistan

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***Corresponding Author:**

Muhammad Hashim

University Institute of Radiological Sciences and Medical Imaging Technology, The University of Lahore, Lahore, Pakistan

hashimmuhammadch226@gmail.com

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ABSTRACT

Inguinal Hernia is one of the most common problems affecting the population coming with groin pain. **Objective:** To find the incidence of occult inguinal hernia diagnosed with ultrasound in patients with groin pain. **Methods:** Descriptive study was conducted at Gilani Ultrasound Centre. Data of 200 participants were designated done with suitable sample method. Data were analyzed by SSPS version 24.0. **Results:** Out of 200 male patients the Mean Age ± SD ratio is 23.1±15.7. 38(19%) patients presented with pain bilaterally, left sided pain was presented in 43(21.5%) patients and right sided pain was presented in 119(59.5%) patients. In 25(12.5%) patients occult inguinal hernia was detected and in 175(87.5%) patients occult inguinal hernia was not detected. In 2(1%) patients occult inguinal hernia was detected bilaterally, in 6(3%) patients occult inguinal hernia was detected on left side and in 17(8.5%) patients it was detected on right side. The mean size of the defect on right side was 2.24 and on left side was 5.0. **Conclusions:** Study concluded that occult inguinal hernia detected in 12.5% patients and majority of them were young adults. Due to the sensitive nature of groin ultrasound, patients may be referred for it if the results of the clinical examination are inconclusive or negative.

INTRODUCTION

Groin pain is a relatively common ailment [1]. Inguinal hernia is the most frequent cause of it as well as the most prevalent type of abdominal wall hernia [2]. Pathologic protrusions of the peritoneal cavity are referred to as hernias [3]. So, inguinal hernias result when internal tissues of the abdomen push through a weak spot in the groin muscles. This can cause a bulging lump in your groin area and thus pain occurs. However, occult inguinal hernias are problematic hernias that are not palpable on evaluation [4]. Small inguinal hernias known as occult hernias are challenging to identify during a clinical assessment [5]. Early diagnosis and treatment of occult hernias is critical for symptom relief and improving patients' quality of life. The exact cause of inguinal hernia is unknown. However, abdominal wall hernias are frequent, with an incidence of 1.7 % in people of all ages and 4% in people over 45. 75% of abdominal wall hernias are inguinal hernias; men have a lifetime prevalence of 27% and women have a lifetime prevalence of 3% [6]. The etiology of indirect inguinal hernias in adults as in infants is congenital [7]. Men are more likely than women to have inguinal hernias. An inguinal hernia can become more likely in some situations. Strenuous exertion carries a higher risk. Individual studies on varicose veins discovered associations with inguinal hernia. A history of hemorrhoids and a hiatal hernia were also identified as triggers. Many other factors such as weight, tobacco (number of cigarettes smoked and years smoked), and alcohol intake had no correlation with the

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instances [8]. Development of inguinal hernias is also significantly influenced by a favorable family history [9]. When it comes to inguinal hernias, advanced age, longer duration of hernia, and irreducibility are possible causes for acute complications [10]. Complications of inguinal hernia comprise incarceration, bowel obstruction, and bowel strangling (which can be deadly), with elderly people having the highest risk. There is a possibility of an occult inguinal hernia when an inguinal hernia is present, on the other side [11]. Therefore, earlier detection of an inguinal hernia is compulsory. As it is difficult to diagnose occult inguinal hernia based entirely on a patient's clinical exam and previous history, imaging is essential before moving on to the next management stage. Imaging is helpful in identifying and characterizing different problems in groin region. Different imaging techniques, including ultrasound scans, herniograms, laparoscopy and MRI scans been employed for diagnosing groin pathologies [12]. Although MRI has been shown to detect hernias, it has not been proven to be very accurate. CT scans also produce conflicting results when it comes to hernia diagnosis. Laparoscopy is another method for diagnosing occult hernia and the occult contralateral hernia, but it is invasive as well [13]. Herniography is an invasive procedure that can result in problems such as hematoma and allergic responses [14]. Ultrasound has supplanted various imaging modalities in the diagnosis of groin pain in many areas [15]. This is mostly owing to the fact that ultrasound has a high diagnostic accuracy that is unmatched by other cross-sectional imaging modalities. The ability of ultrasound to provide a true real-time and dynamic evaluation, which is not feasible with the other cross-sectional imaging, is critical to its success. Because ultrasonography is a real-time examination, it can aid in the identification of hernias by demonstrating movement of any herniated contents or performing a Valsalva maneuver, or by examining the patient in an upright position, allowing for the protrusion of a difficult-to-identify hernia. Moreover, because of its superior inherent soft tissue contrast and resolution, ultrasound is a good choice for immediate scanning and dynamic evaluation of the patient's pain source [16]. It is less expensive and does not use ionizing radiation. Ultrasound has comparable sensitivity. It is non-invasive and can be performed in the office by the surgeon. As a result, it can be used again and again during a symptomatic episode [17]. Color Doppler ultrasound can differentiate between direct and indirect hernias with a sensitivity of 90% and a specificity of 86%. Even with a negative physical examination, ultrasound can detect hernias in patients and discover abnormalities apart from hernias (e.g., femoral artery aneurysm) [18]. When a hernia is clinically palpable, ultrasonography has a good detection sensitivity and positive predictive accuracy. Inguinal hernias are a very constant complaint occurring in the males and the diagnosis is mainly dependent on the checkup by the surgeon. With this study we want to highlight the importance of USG in the patients with hernia which is not apparent on physical examination.

METHODS

It was a descriptive study which was conducted at Gilani Ultrasound Centre. A total of 200 male patients were included in the study. All patients gave informed consent, and formal ethics approval for the study was obtained. Inclusion criteria included Males of all ages were included and Patients without any visible defect. Patients who had visible hernias were excluded from the study. All patients were scanned supine in the relaxed state as well as during coughing and during a valsalva maneuver. Ultrasound features of hernia included direct visualization of a hernia sac containing bowel (Fig. 1) or omentum; a positive cough/valsalva impulse which was reducible. (Fig. 2) The ultrasound scans were performed by either experienced consultant radiologist or sonographer using a 5-8 MHz frequency linear transducer.

RESULTS

All the 200 consecutive male patients with complaints of groin pain presented for consultation in Gilani Ultrasound Centre were included in the study. Out of 200 male patients the Mean Age ±SD ratio was 23.1±15.7 years. 38(19%) patients presented with pain bilaterally, left sided pain was presented in 43(21.5%) patients and right sided pain was presented in 119(59.5%) patients. In 25(12.5%) patients occult inguinal hernia was detected and in 175(87.5%) patients occult inguinal hernia was not detected (Table 1).

Occult Inguinal Hernia	Frequency (%)
Detected	25(12.5%)
Not Detected	175(87.5%)
Total	200(100.0%)

Table 1: Frequency Distribution of Occult Inguinal Hernia

The following table shows that out of 200 patients occult inguinal hernia was detected in 25(12.5%) patients and in 175(87.5%) occult inguinal hernia was not detected. In 2(1%) patients occult inguinal hernia was detected bilaterally, in 6(3%) patients occult inguinal hernia was detected on left side and in 17(8.5%) patients it was detected on right side. Table 2: Comparison shows the affected side on both side were detected in 2 patients with occult inguinal hernia and 36 patients with no occult inguinal hernia, affected on left side was detected in 6 patients with occult inguinal hernia and 37 patients with no occult inguinal hernia, on right side with 17 detected with occult inguinal hernia and 102 with no occult inguinal hernia.

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Affected Side		Occult Inguinal Hernia		Total
		Detected	Not Detected	
Bilateral	Count%	2	36	38
	within Affected Side	5.3%	94.7%	100.0%
Left	Count%	6	37	43
	within Affected Side	14.0%	86.0%	100.0%
Right	Count%	17.	102	119
	within Affected Side	14.3%	85.7%	100.0%
Total	Count%	25	175	200
	within Affected Side	12.5%	87.5%	100.0%

Table 2: Percentage of affected side and occult inguinal hernia

The mean size of the defect on right side was 2.24 and on left side was 5.0. Table 3 shows the report in which we calculated the mean and standard deviation of defect detected in patients, in which mean of defect detected on right side was 2.24, standard deviation 3.455, left side mean was 5.0, standard deviation 3.22.

Occult Inguinal Hernia		Size (mm) - Left	Size (mm) - Right
Detected	Mean±SD	2.2400±3.45531	5.0800±3.22697
	N	25	25
	Median	.0000	6.3000

Table 3: Descriptive statistics of size detected on both sides.

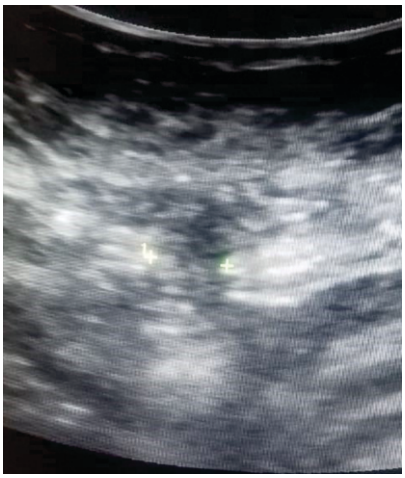

Figure 1: Transverse section showing occult inguinal hernia containing bowel.

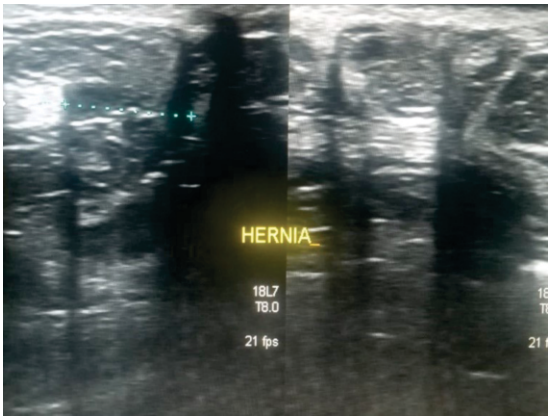

Figure 2: Transverse section showing occult inguinal hernia on valsalva maneuver. Dotted line showing hernia sac.

DISCUSSION

Clinical evidence of a bulge that is reducible and exhibits an expansile cough impulse helps to identify groin hernias. When no symptoms exist, the identification is frequently made by ruling out any other potential origins of a bulge. The diagnosis and treatment of individuals with groin agony depend heavily on reliable imaging. Out of 200 male patients the Mean Age ±SD ratio was 23.1±15.7 years. 38(19%) patients presented with pain bilaterally, left sided pain was presented in 43(21.5%) patients and right sided pain was presented in 119(59.5%) patients. In 25(12.5%) patients occult inguinal hernia was detected and in 175(87.5%) patients occult inguinal hernia was not detected. A study by Haanu Paajenan et al., [19]. was carried out on the prevalence of occult inguinal and spigelian hernias during laparoscopy for various details. This research sets out to measure the frequency of hernias occurring during laparoscopy for several other disorders. There were one hundred thirty-three females and sixty-eight males, with mean age of 53+ 14 years. Out of 201 patients, there were a total of 43 (21%) unanticipated hernias. Overall, there were more hernias in men than in women. (P .003). An indirect inguinal hernia was the most frequent occurrence in 27(13%) of the patients [15]. Unlike that study, the participants in ours were only male. Patients' ages ranged 23.1+ 15.7 years, on average. Occult inguinal hernia was identified in 25 out of 200 individuals. Inguinal hernias are thought to be more common in male infants with anatomical anomalies of the inguinal canal, according to various medical authorities [20]. According to research by Ruhl and Everhart et al., [2]. inguinal hernia is a common complaint in adults; therefore, more than one-fourth of adult men in the united states, should likely to have clinically ruled out inguinal hernia. In fact, inguinal hernias in men significantly rose in frequency as they aged. This situation is comparable to our findings in that inguinal hernias were more prevalent in younger people in our sample. In contrast, there were no inguinal hernias seen in the geriatric or older group. D.Light et al., [5] did research in 2005 on the Use of ultrasound to diagnose occult inguinal hernias. In the trial, which ran from January 2007 to August 2008, 297 individuals who showed up throughout the course of 18 months were enrolled. As a consequence of one hundred sixty-seven examinations' (56%) positive results for a hernia, one hundred sixteen patients go through surgery. Surgery revealed a hernia in eighty-five cases, while in the other thirty-one cases there was no hernia found. After 130 tests, 44% of them revealed no hernia. Six patients required surgery in spite of a negative ultrasound because of lingering pain and the identification of a hernia in five cases. Overall, it was shown that

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ultrasound had a 94% sensitivity in relation to surgical outcomes. If ultrasound is utilized in conjunction with clinical judgement, its positive predictive value is 73%. In contrast to our findings, out of a total of 200 patients, 175 (87.5%) were negative for occult inguinal hernias, while 25 (12.5%) were positive. The positive predictive value of diagnostic ultrasonography for occult hernia was explored by M. Bradley et al., [13] in a study that was published in 2006. A total of one hundred thirteen patients were sequentially sent for ultrasonography exams with physically assumed occult hernias. 59 scans in total identified hernias, and 56 of these individuals underwent surgery. The surgical examination of the other three patients revealed no hernias, and two of them expressed no interest in having it fixed. With regard to 82 patients (or 70.6%), 59 of them had hernias, and an ultrasound was used to diagnose their symptoms. 98.3% of cases with a hernia turned out to be positive. In comparison, the findings of our study showed that, out of 200 patients, 38 (19%) patients had bilateral pain i.e., on both the left and right sides, 43 (21.5%) patients had pain on the left side, and 119 (59.5%) patients had pain on the right. 25 (12.5%) of the total number of patients had occult inguinal hernias, while 175 (87.5%) had no hernias. Adeeb Alam et al., [16] did a study in 2005 on the reliability of sonographic diagnosis in clinically occult groin hernias. The trial included 52 consecutive adults who had groin pain that was assumed to be coming from a groin hernia. A surgical center recommended them. A total of one hundred four groin were evaluated using ultrasound and herniography, and the existence or nonexistence of hernias was reported. A vaso-vagal reaction following herniography in one patient was the only adverse event that has been documented; it was treated with intravenous Fluid and atropine. Herniography revealed 32 groin hernias in 24 patients. 8 bilateral and 16 unilateral, or 30.8% of the total. In relation to our study, we discovered that ultrasonography was performed rather than herniography. There were two bilateral hernias out of the 25 hernias that were found, as well as hernias on the right (17) and left (6). 175 (87.5%) of the patients had no occult inguinal hernia. 2.24 mm of defects were identified on right side and 5.0 mm on left side, respectively.

CONCLUSIONS

Study concluded that out of 200 male patients occult inguinal hernia detected in 12.5% patients and majority of them were young adults. Due to the sensitive nature of groin ultrasound, patients may be referred for it if the results of the clinical examination are inconclusive or negative.

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