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ACKNOWLEDGEMENT

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PAKISTAN JOURNAL OF HEALTH SCIENCES
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The Opioid Crisis

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The opioid crisis has become one of the most pressing public health issues in recent times, with devastating consequences for individuals, families, and communities. As per the Center for Disease Control and Prevention (CDC), nearly 500,000 people in the United States have died from opioid overdose between 1999 and 2019 [1]. The current opioid epidemic is a multifaceted problem that demands comprehensive and integrated strategies to address it effectively. One of the key approaches to address the opioid crisis is harm reduction, which involves reducing the negative consequences of drug use for individuals, families, and communities. Harm reduction strategies include the provision of naloxone to reverse overdoses, access to clean syringes, and testing for infectious diseases such as HIV and hepatitis C. However, harm reduction approaches are often criticized for being permissive and promoting drug use. Still, evidence suggests that harm reduction strategies can be effective in reducing harm and improving health outcomes. Another critical strategy to address the opioid crisis is promoting recovery, which involves supporting individuals in their journey towards sobriety and wellness. Recovery-oriented systems of care aim to provide comprehensive, person-centered, and evidence-based interventions to support individuals with substance use disorders. This includes medication-assisted treatment, counseling, peer support, and community-based resources. Promoting recovery requires a long-term commitment and a collaborative effort from healthcare providers, policymakers, and communities to ensure that individuals receive the support they need to achieve their recovery goals [2]. In conclusion, addressing the opioid crisis requires a multi-pronged approach that integrates harm reduction and recovery-oriented strategies. While preventing opioid misuse and addiction is a key priority, it is equally important to ensure that individuals who are already struggling with substance use disorders receive the necessary support to recover and rebuild their lives. Through collaborative efforts and evidence-based interventions, we can work towards reducing harm, promoting recovery, and improving the overall health and well-being of our communities.

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Review Article

Epidemiology, Clinical Manifestations, Treatment Approaches and Future Perspectives of Rift Valley Fever

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ABSTRACT

Rift Valley fever (RVF) is a mosquito borne viral disease that had been firstly revealed in Kenya in 1930. It has now become an endemic in all over multiple African states as well as in Arabian Peninsula. In the early days, RVF was assumed to be geologically restricted to only sub-Saharan Africa, thus, RVF generally had not been considered in the diagnosis of disease epidemics outside of the Africa. The loss of livestock had furthermore threatened the livelihood of people who were dependent on the animals for their food and income. Weakness, chills, headache, fever are considered to be the most common symptoms that arise in the patients suffering from RVF. Nevertheless, the choices for control of the RVF outbreaks have been restricted by the lack of approved human vaccines or other medications. Ribavirin, Favipiravir and various other anti-viral drugs had shown to be effective against the rift valley fever. However, only supportive care had been used for the treatment of the RVF. For that purpose, Rift Valley Fever had now been prioritized by the World Health Organization (WHO) for urgent research and development of countermeasures for the control and prevention of future outbreak. In this review, we had highlighted the outbreak of Rift Valley Fever in various countries, its epidemiology, clinical manifestations, various medications that had been used for the treatment of this infectious disease and also the future prospectives regarding the RVF based on up-to-date data extracted from reputed journals and official websites.

INTRODUCTION

An evolving arboviral disease Rift Valley fever (RVF), had affected humans as well as the livestock in the Middle East, western Indian Ocean and Africa. In Kenya, This disease was very firstly defined in 1930 after abrupt mortality in the lambs that arose on a farm in the region of Rift Valley [1]. Substantial rise in the adjacent regions arose in initial 2000s when this outbreak was reported in Yemen and Saudi Arabia. To this day, many of the Egypt region and Sub-Saharan Africa is now considered to be endemic for Rift Valley fever virus (RVFV) or had been affected by infrequent outbreaks [2-7]. RVFV is adherent to the Bunyavirales order, Phenuiviridae family, of negative-sense RNA viruses. It consists of 3 genome segments: small (S) segment that had encoded nucleoprotein N as well as non-structural proteins, large (L) segment that encodes viral RNA-dependent RNA polymerase (RdRp) and medium (M)

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segment that encodes surface glycoproteins Gc and Gn accompanied by nonstructural protein NSm. Humans could be exposed by the bite of mosquito or may be by the contact with the tissues and infected fluids. Numerous studies had suggested the transmission of vector-borne to be likely for humans [8]. Exposures of Zoonotic may be determined by much of homestead and occupational behaviors that have been performed with consistency. Occupational exposures had been exposed to provoke a larger occurrence than the individuals that have close contact with or caring for the animals at homestead, as well as is expected to be related to contact with some larger volume of animals and their fluids [9]. Another possibility is the Aerosolization, though it is very not likely route of transmission, as well as had been very much associated with a larger probability of the unembellished disease in the laboratory experiments [10]. About 1–2% of the cases had experienced symptoms of hemorrhagic fever, whereas approx. up to 50% of the hemorrhagic cases are very deadly [11]. Many In-vitro studies had previously proposed that, the hemorrhage that results by the Rift Valley Fever Virus infection caused by the rift valley fever virus (Figure 1) might be related to the expression levels of transcription factor IIH (TFIIH) [12]. It had been recommended that hemorrhagic cases of Rift valley fever virus infection might enhance risk of the nosocomial transmission for the healthcare workers as well as many other individuals providing care [13], so far human-to-human passage transmission via the nosocomial routes of contact had up till now to be documented. This review describes the epidemiology of the disease, clinical manifestations that were observed of Rift valley fever, a brief treatment and prevention approaches for the rift valley fever and also the future prospectives of this infectious disease built on the most current literature report since the outbreak.

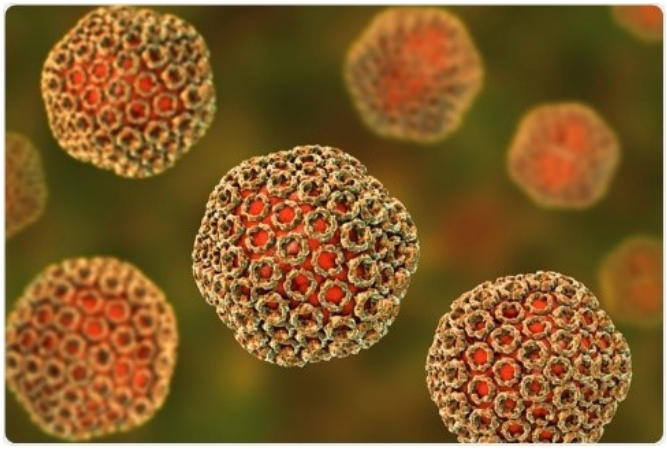

Figure 1: Rift Valley Fever Virus (RVFV)

Epidemiology

Very recently, RVFV had appeared to be recurring much more often, by approximately many areas of the Eastern Africa going through the eruptions of Rift valley fever after each four years [2, 14]. Systemic investigations of seroprevalence studies and case reports had founded, Rift Valley Fever Virus been familiar in all the 5 African regions encircling 80% of all the countries belonging to African region [2]. The appearance of Rift Valley Fever in Arabian Peninsula in initial 2000s was expected to be occurred because of import of the disease-ridden mosquitos or may be livestock during the trade crosswise the Red Sea [15]. Livestock investigations had shown a very extensive range of Rift Valley Fever Virus seroprevalence, with less than one percent to approximately 50% in the cattle, camels and goats as well as equal to 90% of sheep, contingent on season, vicinity, age of animal, bioclimatic region and animal breed [16-20]. This virus had continued to blowout to many other portions of Africa that had not been formerly detected as well as introduction of the disease hooked on the other countries leftovers a very potential threat [2, 21, 22]. Many human cases succeeding epizootic eruptions could array from thousands to hundreds, along with many of the case fatalities amid to be found between 1% and 30% in the symptomatic individuals reporting to authorities of healthcare system [23, 24]. Incidence of Rift Valley Fever Virus infection might be misdiagnosed and underrated or lest adjacent to a known livestock eruption because of non-specific symptoms of disease as well as similarity to cocirculating pathogens [25, 26]. RVFV overlays with the other endemic viral diseases and with some identical disease manifestations, including West Nile virus (WNV) and Lassa fever possibly complicating treatment and diagnoses of the cases.

Clinical manifestations

Majorly, the cases of RVF are very self-restrictive as well as could be recognized by slight frequently sub-clinical febrile sickness and also by means of incubation time of characteristically up to 4 to 6 days [27]. Symptoms mainly comprises of severe chills, malaise, dizziness, weakness, and headache [28]. Typically, many patients had suffered from a two phasic febrile phase, that had been recognized along with an unembellished headache. Some individuals alternatively, who had developed the very unembellished forms of Rift valley fever had been at very increased risk of the fatality. Liver infection is mostly characterized by the increase in lactate dehydrogenase, aspartate aminotransferase, alanine aminotransferase as well as decreased hemoglobin and count of platelet are significant [29]. Demise could happen mostly in about 3–17 days afterwards the initiation of these signs as well as deadly cases of Rift Valley Fever had showed diffuse gastrointestinal as well as hepatic necrosis. Many individuals had presented a reduced level of consciousness

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that are suffering from RVF-induced encephalitis. In many cases, patients with RVF could grow a maculo or retinopathy (0.5 to 2%), that could affect in either one or both the eyes as well as could occur in either very initial or months afterward infection. Many studies had described that some patients could have loss of vision or also may have a blurry vision. Though, in many scenarios a fractional development in visualization over time had been recognized [30], yet, numerous individuals would experience complete or might be partial blindness [31].

Various medications for Rift Valley Fever Virus

Mostly, antiviral treatments either be targeting the processes intrinsic to viruses, for example, binding of host cell and also the viral genome replication, or can moderate the host cellular progressions that are very significant for virus lifecycle.

Table 1: Summary of antiviral medications for treatment of Rift Valley Fever

Therapeutics	Mechanism	In-Vitro Results	Reference
Ribavirin ± poly(ICLC)	Nucleoside analog ± immunostimulant	78 µg/ml (Vero)	[32]
Suramin	Interaction of vRNA/N	22.3 µM (HEK 293T)	[33]
Favipiravir (T-705, AviganR) ± ribavirin	Nucleotide analog ± nucleoside analog	31 µM (Vero 76)	[34]
Sorafanib	RNA synthesis	6.4 µM (Vero)	[35]
Rapamycin	Inhibition of mTOR	11 µM (H2.35)	[36]
Bortezomib	Inhibition of Ubiquitin proteasome	0.01 µM (HSAEC)	[37]
GYY4137 (H2S-donor)	Reactive species scavenger	5 mM (Vero)	[38]

Existing approaches for the treatment of patients suffering with RVF as shown in Table 1 mainly focus on providing symptomatic care. RVFV ZH501, a pathogenic strain that had been isolated from a deadly human case during the first outbreak of Egyptian Rift Valley Virus in 1977 to 1978. This strain had been recognized as a select agent, as well as could be utilized at BSL4 or BSL3E containment. MP-12 strain had been established via the consecutive plaque channels of strain of Egyptian ZH548, that is 12 times more in the presence of a chemical mutagen, 5-fluorouracil. RVFV ZH548 had also been isolated from a febrile patient when it was Egyptian outbreak in 1977 to 1978 [39].

Ribavirin

Ribavirin, a nucleoside analogue, had been considered as one of the few drugs that have been permitted for the therapy of particular viral hemorrhagic fevers [40]. Subsequently, the progress in 1980s, this had been considered to be very foremost anti-viral that had been investigated in the models suffering from infection with phlebovirus. In early investigations, it had presented a very high efficiency in vitro utilizing the preserved cell lines that had been separated by the African green monkey, many investigations had been rapidly extended towards a model of infection in mice with the tightly linked phlebovirus and the Punta Toro virus. At this time, therapy of ribavirin had very much decreased copying of the virus as well as the harshness of symptoms along with the 100% persistence at daily administration of 18.8 mg/kg subcutaneously, by primary therapy of 4 hours just before the subcutaneous infection. Inappropriately, side effect ribavirin profile, most commonly hemolytic anemia and inflammation, had been restricted its usage in the clinical settings. Encapsulation of the lipid had been very much effectively utilized in decreasing side effects via the administration of lesser but more of the targeted doses, that results in the enhanced persistence of the mice that are infected [41].

Favipiravir

Favipiravir, formerly developed by the Toyama Chemical (Japan), had been considered as a non-nucleoside inhibitor in influenza polymerase as well as had also received the support for using in contrast to the viruses of influenza in Japan as well as Phase-III clinical investigations had been finished in United states of America [42]. Prominently, favipiravir had been verified to be as effective as a broad spectrum anti-viral that is against a very broad spectrum of the RNA-viruses that includes yet had not been restricted to paramyxo-, arena-, filo-, as well as bunyaviruses. In preliminary, in-vitro studies had shown that the favipiravir is very extremely active against the bunyaviruses from diverse genera, that includes Rift Valley Fever Virus along with an EC50 of about 32 µM. Afterwards, the efficiency of favipiravir had been investigated in a model of hamster for Rift Valley Fever Virus ZH501. The treatment started 1-hour post-infection (HPI) along with a 200 mg/kg/day twice daily (BID) orally (PO) for 10 days protected 80% of SC infected animals along with 30 pfu RVFV ZH501. Ribavirin (75 mg/kg/day, BID, PO) had been a part of as a positive control as well as only bring about in the 20% of survival. In another investigation, by the use of an aerosol exposed model of Wistar–Furth rat, Caroline as well as his various colleagues had demonstrated that the animals that have received favipiravir inside the 1 HPI at 100 mg/kg/day BID per oral for 14 days had been completely covered from the deadly Rift Valley Fever Virus infection together with 50 pfu. Once the treatment had been started 48 HPI, the persistence rate was mainly considered to be 92% [43].

Vaccines

At present, no vaccine is there for the prevention of Rift valley fever infection that had been permitted for use in the

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animal in Europe or North America. Subsequently, initial isolation of the Rift valley fever virus, multiple vaccines against the RVF virus had been established, that includes the vaccines that had been produced via inactivation of formalin [44]; by attenuation via the in vivo serialized passage and can be via the in vitro chemical mutagenesis [39]; through the use of naturally founded attenuated mutant virus, recombinant virus vectors, viral subunits or by viral cDNA; as well as by using the recombinant live attenuated Rift valley fever virus that contains whole removals of the already recognized virulence genes. In the last 50 years, each of these methods had been leading to the extra refinements in safety and efficacy of the vaccines as well as had enhanced the understanding of RVF virus vaccinology. Vaccines that are Formalin-inactivated have been considered as safe, yet they also have problems for use in field because of characteristic requirement for three early inoculations over a period of one to two months that have been then followed by the annual booster inoculations [45]. Though, for use in human, a formalin-inactivated product had been formed in the middle of the 1970s further down a new innovative license of drug from the Food Drug Authority. The usage of this vaccine had been very firstly been beset at laboratory as well as on the other service personnel by large occupational hazard of contact to the virus. Though, now, no further produced as well is also in the restricted supply, TSI-GSD-200 had been verified as an effective, immunogenic, and safe in reducing the laboratory acquired infections between 598 human vaccines. The strain of live-attenuated Smith-burn Rift Valley Fever virus had been efficacious as well as immunogenic in the adult cattle and sheep, yet this had too caused teratologic effects in the fetuses or abortion in approximately 25% of the pregnant animals [46]. Therefore, this vaccine is very much probably inappropriate for the use in the areas that are separate of endemic zone of Rift Valley Fever virus activity.

Future perspectives

During the past years, further research had focused on the emergent pathogens with the goal of enhancing our preparation for any of the future outbreaks. RVFV had a complex ecological cycle that involves a very large range of livestock, vectors as well as wildlife species. Unfortunately, present surveillance is sub-optimal in several at-risk countries with numerous eruptions that remains unreported [47]. Preferably, proper surveillance measures would enable farmers to report unexplained disease in their livestock, which can be investigated and allow suitable measures to be implemented to reduce spread [48]. The development of specific therapeutics and vaccines is also of major importance. Disadvantages of current livestock vaccines and the absence of a licensed human vaccine have limited our ability to effectively respond to outbreaks. More research is essential for a better understanding of viral maintenance during IEPs; the part of vertical transmission in mosquitoes and flow in wildlife in numerous ecological surroundings. Information of how diverse ways of human exposure, for example via mosquito bite or via contact with the infected animal products, affect the immune response as well as disease results are still missing. Moreover, the role cellular immunity plays in livestock as well as in humans is still uncertain. Lastly, a better understanding of the causes of the various manifestations of RVF disease might be helpful to rationalize why an infection is asymptomatic or connected with the clinical, sometimes fatal, illness. As a single serotype of RVFV causes disease in multiple species, opportunities exist to look more broadly at immunological differences between species as well as how they are affecting the disease results. Currently, the absence of a licensed human vaccine has limited our ability to effectively respond to outbreaks. More research is essential for a better understanding of viral maintenance during the emergency outbreak. A better understanding of the causes of the various manifestations of Rift Valley Fever disease might be helpful to rationalize why an infection is asymptomatic or connected with the clinical, sometimes fatal, illness. This review recommends various treatment and prevention approaches of the RVF and in future what measures should be adopted for this outbreak as well as also describes the clinical symptoms that appears in the individuals that suffer from the Rift valley fever, built on the most current literature report since the outbreak.

CONCLUSIONS

Rift Valley Fever was first recognized as an outbreak in 1930. Symptoms of this infection arises usually from 4 to 5 days. Anti-viral such as ribavirin are thought to be an effective medication for the treatment of the rift valley fever. Although there had been a decent development in characterizing the virological, clinical and pathological features of RVFV infection, RVFV still causes outbreaks in African countries or in the Arabian Peninsula. The advances of safe, effective, highly immunogenic and economic vaccines for humans and animals would prevent RVF in endemic countries and further investigations are to be done to get the best possible treatment of the Rift valley fever.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Comparison of Coronary Artery Bypass Grafting Outcomes in patients with and without Prior Percutaneous Coronary Artery intervention

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ABSTRACT

Percutaneous coronary intervention (PCI) is a crucial treatment for patients with coronary artery disease (CAD), especially high-risk patients like advanced age, diabetes, chronic kidney disease, left main lesions, and multi vessel CAD. **Objective:** To compare coronary artery bypass grafting outcomes in patients with and without prior percutaneous coronary artery intervention. **Methods:** This retrospective 5-year cross-sectional study was conducted on 2579 patients operated for CABG in between August 1st, 2017, and December 31st, 2021 in a tertiary care hospital. All patients who underwent CABG were included in study, and comparison was done in patients with or without PCI. Data analysis were done by using SPSS version 23. $p<0.05$ was set statistically significant. **Results:** The results of perfusion and cross clamp time in operative room, use of IABP and reopening rates in both groups showed no statistically significant difference. The incidence of post-operative atrial fibrillation in group A is 4% Vs 1.5% in group B with significant p value of 0.028. Prolong ventilation, perioperative stroke and reintubation rates comparison in both groups were with non-significant p values. In hospital mortality was 4.5% in group A and 3.7% in group B with p-value of 0.370 which is non-significant. **Conclusions:** Patients with prior percutaneous coronary intervention can undergo CABG surgery with similar mortality rates as those with no prior PCI. The only significant difference in morbidity is post-operative risk of atrial fibrillation which is more in prior PCI patients' group.

INTRODUCTION

Percutaneous coronary intervention (PCI) is a crucial treatment for patients with coronary artery disease (CAD), especially high-risk patients like advanced age, diabetes, chronic kidney disease, left main lesions, and multi vessel CAD [1]. The outcomes and risk/benefit ratio of the two generally accepted CAD treatment techniques, namely percutaneous coronary intervention (PCI) and coronary artery bypass grafting (CABG) surgery, have been studied in a number of randomised trials (RCTs) and a multitude of retrospective research [2]. Acute PCI has largely replaced surgical-based revascularization of ACS as the main revascularization strategy, but coronary artery bypass grafting (CABG) still has a significant place in routine care for some indications [3]. Observational studies have shown that CABG has a better prognosis than PCI for patients with severe LV dysfunction, defined as an ejection fraction (EF) of 35% or less. The effectiveness of PCI versus CABG in patients with moderate LV dysfunction, that is, with an EF between 36% and 40%, has not been compared in any studies, though [4]. The development of

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percutaneous coronary intervention (PCI) has increased CHD patient survival while simultaneously lowering the demand for CABG. PCI entails percutaneous access to the femoral, radial, or brachial arteries while under local anesthesia in order to perform wire-guided balloon inflation angioplasty, following stent deployment to preserve vascular patency, this compresses the plaque and opens the vessel [5]. However Interventional cardiologists have traditionally viewed in-stent restenosis (ISR) as their "enemy" which may lead to another intervention, either a second PCI or a coronary artery bypass [6]. Therefore, there is a corresponding rise in the number of patients getting coronary artery bypass grafting (CABG) who have previously undergone PCI operations [7]. The percentage of patients reportedly presenting for CABG who have previously undergone PCI is13-40% [8]. In addition to preventing recurring angina and repeat interventions, CABG is a more successful treatment than PCI in terms of survival and preventing serious adverse cardiac events (MACEs) but the belief that patients can be safely directed to surgery if PCI fails is one of the factors contributing to the rapid growth in the use of PCI [9, 10]. As a result, there are now between 13 and 40% more patients presenting for CABG who had previously undergone PCI [11]. A study done in Pakistan showed that 1 in 4 people aged ⩾40 years might develop ischemic heart disease. The risk factors involved are increasing age, smoking history and metabolic syndrome and female gender. The presence of comorbid like diabetes, hypertension and dyslipidemia further increases the risks associated with coronary artery disease [12]. Since the burden of CAD is high in our population and with the availability of tertiary care services in remote areas, incidence of PCI and CABG is increasing day by day. The objective of our study was to compare coronary artery bypass grafting outcomes in patients with and without prior percutaneous coronary artery intervention.

METHODS

This was a descriptive study at a Tertiary Care Hospital starting from 1st August 2017 till 31st Dec 2021. The data were collected from database of cardiac surgery department. Inclusion criteria was all coronary artery bypass grafting patients which were performed at our institute between 1st august 2017 to 31st December 2021. Exclusion criteria was those patients with concomitant procedures like ASD/VSD closure or aortic/mitral valve repair/replacement along with CABG and they were excluded from the study. The total patients were 2579 amongst them 176 patients previously got PCI while 2403 had native CABG. The above group of patients were classified into 2 and results compared on the basis of their intraoperative and postoperative variables collected from database record. The primary outcome was in-hospital mortality defined as any mortality occurring in the index hospital admission during the postoperative hospital stay before the discharge of patient. All the patients were prepared for surgery in routine manner with all necessary preoperative laboratory and radiological investigations done. The patients underwent usual on pump CABG with routine anesthetic approach. Left internal thoracic artery was used as arterial conduit and saphenous vein graft as venous conduit. We utilized the SPSS version-23 for data entry and analysis. For Statistical calculation, the chi-square test was applied. p-value lower than 0.05 was set statistically significant.

RESULTS

A total of 2579 patients were included in the study: group A includes 176 patients who had prior PCI before CABG, group B includes 2403 patients who had no PCI before CABG. The intraoperative parameters measured in our study were perfusion time and cross clamp time in both group of patients. The perfusion time on cardiopulmonary bypass machine during CABG surgery in prior PCI patients was 101.9 minutes and 99.25 minutes in no previous PCI group. The cross-clamp time was 57.08 minutes and 55.54 minutes respectively in both groups. Table 1 shows that the perfusion and cross clamp time were bit higher in group A patients as compared to group B. The postoperative parameters included in our study were use of intra-aortic balloon pump, reopening for bleeding or tamponade, in hospital complications which includes pleural effusions, wound infections, prolong stay etc), post operative atrial fibrillation, prolong mechanical ventilation that is defined as ventilator support more than 24 hours in ICU post CABG surgery, reintubation, post operative stroke incidence, and in hospital mortality.

Table 1: Intra-Operative Parameters

Variables	Group A (patients with previous PCI before CABG) N= 176	Group B (no PCI before CABG) N= 2403
Perfusion time (in mins)	101.90+/- 29.042	99.25+/- 29.669
Cross clamp time (in mins)	57.08+/- 20.735	55.54+/- 19.490

Table 2 compares these post operative parameters in both the group of patients. The use of IABP is 9% in group A and 8.4% in group B with p value 0.367 which is nonsignificant. Reopening rate is 8.5% in group A as compared to 7.5% in group B with p value 0.374. The incidence of in hospital morbidities in group A is 25% and 18.3% in group B. the incidence of post-operative atrial fibrillation in group A is 4% Vs 1.5% in group B with significant p value of 0.028. prolong ventilation and reintubation rate in group A was 1.7% and 0.6% as compared to 1.5% and 1.9% in group B with non-significant

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p values. The incidence of post operative stroke in group A was 2.8% whereas 1% stroke rate in group B. In hospital mortality was 4.5% in group A and 3.7% in group B with p value of 0.370 which is non-significant. The results showed that the patients who previously had PCI were at a higher risk of getting post operative atrial fibrillation. Previous PCI in CABG patients has no effect on mortality and other intraoperative and post operative complications as p-value was insignificant for the calculated variables.

Table 2: Post-Operative Parameters

Variables	Group A (patients with previous PCI before CABG) N= 176	Group B (no PCI before CABG) N= 2403	p-value
IABP	16(9.0%)	203(8.4%)	0.367
Re Opened for Bleeding/ Tamponade	15(8.5%)	182(7.5%)	0.374
In Hospital Complications	44 (25%)	440(18.3%)	0.246
Post Operative Atrial Fibrillation	7 (4.0%)	37(1.5%)	0.028
Prolong Ventilation (More Than 24 Hours)	3 (1.7%)	38(1.5%)	0.506
Re Intubated	1 (0.6%)	47(1.9%)	0.147
Post Operative Stroke	5 (2.8%)	26(1.0%)	0.156
In Hospital Mortality	8 (4.5%)	90(3.7%)	0.370

DISCUSSION

Patients frequently receive PCI as first line therapy due to referral patterns and the less invasive nature of this treatment, despite several randomized trials and large studies 3-6 clearly establishing CABG as the preferred modality over PCI for coronary revascularization in multi vessel disease [13]. Prior multiple PCI in CABG patients results in poor outcomes. The reasons behind this are inflammatory responses, post stenting endothelial dysfunction, per procedural myocardial damage, and late post stenting structural alterations are all brought on by PCI procedures. The coronary artery portion distal to the stented area, which would be the target area of a subsequent bypass graft anastomosis, may also be affected by the late structural alterations [14]. Additionally, coronary side-branch obstruction or occlusion brought on by numerous consecutive and overlapping stents (referred to as "stent jail") may disrupt collateral blood flow, impacting coronary runoff and the patency rate of the bypass grafts [15]. Moreover, the interval between a prior PCI and a CABG may also have an impact on the patients' clinical outcomes [16]. Multiple PCI procedures have become more common. As a result, there is a considerable increase in patients presenting for CABG who had already undergone PCI. According to the current meta-analysis, patients who have undergone PCI in the past and need another CABG for revascularization have a somewhat higher mortality rate soon after the procedure. A study was done by Biancari *et al.*, and Kahlon which reported that having previously undergone PCI did not impart any significant risk for postoperative morbidity or an increased risk of mortality following CABG which is analogous to our study [17, 18]. Another study done by Hassan *et al.*, showed that prior PCI was independently associated determinant of postoperative in hospital mortality using multifactorial methods (odds ratio 1.93, p =.003). In hospital mortality was greater for patients with prior PCI (3.6% vs 1.7%, p =.01) when individuals with previous PCI were compared to patients without prior PCI using predicted values [19]. In our study the percentage of patients who underwent percutaneous intervention before was 6.8% as compared to 93.7% patients who had native CABG surgeries. According to the analysis done by National Heart Institute Egypt, the length of ICU stay was statistically significantly longer for the PCI group A vs non-PCI group B (50.45 hours in group A vs. 79.56 hours in group B), while the hospital stay was not different [20, 21]. In our study we looked at the prolong ventilation of patients which determines the length of stay in ICU, it was slightly greater in those patients who previously had PCI than those who didn't have any percutaneous intervention before, the percentages being 1.5% vs 1.7% with non-significant p value. Atrial fibrillation is defined as a type of supraventricular arrhythmias in which there is uncontrolled atrial activation along with disturbance in mechanical function. The overall incidence of AF in post CABG surgery is estimated to be 5 to 40%. Patients developing atrial fibrillation are at increased risk of developing heart failure, embolic phenomenon and prolonged ICU stay. Our study showed that patients with prior PCI are at increased risk of developing atrial fibrillation. The rate of AF incidence which was higher in PCI group A as compared to no PCI group B, 4% vs 1.5% with p-value of 0.028. The study results of our data showed that previous PCI in CABG patients has no significant difference in outcomes as p-value was non-significant. There is no statistically significant difference in mortality and morbidity of both groups except for atrial fibrillation.

CONCLUSIONS

Patients with prior percutaneous coronary intervention can undergo CABG surgery with similar mortality rates as those with no prior PCI. The only significant difference in morbidity is post-operative risk of atrial fibrillation which is more in prior PCI patients undergoing CABG.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Evaluation of Post-Operative Sensitivity of Nano Filled Composite Versus Bulk Filled Resin Composite in Posterior Class 2 Restoration

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ABSTRACT

Dental composites use adhesives to adhere and are thermally non-conductive. Despite advances in restorative dentistry, adhesive restorations may cause postoperative pain and fail. **Objective:** To compare and evaluate the post-operative sensitivity between nano resin composite using incremental technique and bulk filled resin composite using bulk filled technique in class 2 posterior restorations by assessing the post-operative pain and sensitivity. **Methods:** Two hundred and twenty patients who satisfied inclusion and exclusion criteria were lottery-divided into groups A and B. Nano resin composite was placed via incremental technique in Group A and bulk filled in Group B. Post-operative pain was assessed using Visual Analog Scale 0-10 at 24 hours and 7 days. **Results:** Male patients were 47 (42.7%) and 48 (43.6%), female patients were 63 (57.3%) and 62 (56.4%). Mean of pain was 2.39 ± 0.97 and 2.32 ± 0.81 at 24 hours postoperatively and 0.14 ± 0.63 and 0.00 at 7 days in group A and group B respectively. Pain level was mild in 97 (88.2%) and 105 (95.5%) patients, moderate in 13 (11.8%) and 5 (4.5%) after 24 hours, no pain in 105 (95.5%) and 110 (100.0%) and mild in 5 (4.5%) and 0 (0.0%) at 7 days in group A and group B, respectively. **Conclusion**: Bulk filled resin composite using bulk filled technique is more effective in class 2 posterior restorations as compared to nano resin composite using incremental technique.

INTRODUCTION

Patients frequently complain of sensitivity at various degrees and intensities, even when there is no indication of restoration failure [1]. Post-operative sensitivity after resin-based posterior restorations continues to be a concern for dentists, making it difficult to treat [2]. According to studies, post-operative sensitivity can occur in as little as 5% of cases and as much as 30% of case [3]. Nano resin composites are frequently applied materials in both anterior and posterior teeth for various restorative treatments [4]. However, because of the restricted light penetration, there are drawbacks such as difficulties in polymerizing deep cavities [5]. The application of an incremental technique, which is widely used for posterior tooth restorations, is the best way to overcome this problem [6]. To ensure adequate curing, this technique involves placing composite resin in increments with a maximum thickness of 2mm [7]. Despite being the most commonly used incremental technique for posterior tooth restoration, it has certain disadvantages, such as the time commitment, the lack of space between tooth layers, and

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the potential of contamination [8]. Recently, bulk filled resin with better mechanical and chemical properties have been introduced [4]. Bulk filled composites are a single component, fluoride-containing, clearly light cured radiopaque resin component that may be easily adapted to cavities in restoration [6]. It has conventional flowable composite handling properties, but it can be inserted in 4mm increments with minimum polymerization stress and increased curing depth [9]. According to certain research, placing composite resins in 4mm or 5mm thick increments might produce cuspal deformation and tension at the tooth-adhesive junction, which can manifest clinically as increased post-operative discomfort [7]. The viscosity of bulk fill composite resins is divided into two categories: high viscosity and low viscosity (flowable) compounds. Higher amounts of filler particles are present in high-viscosity bulk fill composites as compared to low-viscosity bulk fill composites. Thus, flowable composite resins conform more readily to cavity walls, but they exhibit more polymerization shrinkage and worse mechanical properties [10]. The findings of several in vitro investigations revealed that bulk fill composites do not increase marginal adaptation in class II cases; rather, the presence or lack of enamel at the restorative edge is a more relevant predictor of marginal adaptation [3]. Bulk-Fill resin has increased in popularity over the years because to its excellent characteristics, success in clinical performance, and flexibility of handling, and has therefore become the material of choice for dentists. Furthermore, its longevity indicates mechanical properties and resilience to tooth structure [11]. In one clinical research, the flowable bulk-fill composite technique was compared to the incremental composite technique in posterior restorations. They found no statistically significant difference between groups in the frequency of post-operative sensitivity following restoration procedure [12]. The purpose of this study is to compare the clinical effect of post-operative sensitivity between Bulk filled composite and incremental Nano resin composite. By comparing the Nano composite and Bulk filled composite we will be able to recommend the choice of restoration in class 2 posterior teeth with minimal post-operative sensitivity.

METHODS

In the period from January 2022 to December 2022, a comparative cross-sectional study using a non-probability convenience sampling method was carried out at the outpatient department (OPD) of the Institute of Dentistry, Department of Operative Dentistry, Liaquat University of Medical & Health Sciences (LUMHS), Jamshoro/ Hyderabad. The sample size calculation was done with equation [DEFF*Np(1-p)]/[(d2/Z21-α/2*(N-1)+ p*(1-p)]. The sample size calculated was 217. After adding 3 more samples to increase the power of study the final sample size was 220. Group A (Nano Resin Composite Using Incremental Technique): 110 Patients. Group B (Bulk Filled Resin Composite Using Bulk Filled Technique): 110 Patients. Patients that not exhibit any signs of deliberate/continuous dental pain with primary carious lesions and having shallow (2 to 3 mm) and mid-sized (3 to 5 mm) cavity depths were enrolled in the research. Patients who had class II molars and premolars in their maxilla and mandibles and needed resin composite restorations as well as those who occluded natural or crown-covered oppositional teeth were also considered. Patients having un-erupted tooth or partially erupted tooth, fractured or visibly cracked teeth patients with poor hygiene and having heavy bruxism habits, periodontal problems and pathologic pulpal diagnosis with pain (Non vital) were excluded from study. Before beginning treatment, all patients provide written informed consent. A brief explanation of the examinations was provided to participants. To evaluate the pulp condition, sensitivity tests with ethyl chloride were performed. For each selected tooth, periapical radiographs were taken to assess the cavity's proximity to the pulp. Local anaesthesia was applied (Inferior alveolar nerve block/infiltrate). Cotton rolls and a saliva aspirator were used to insulate the working field during the procedure. Cavity preparations were done using round-ended carbide bur was used to help create a rounded cavo surface. Using a (CPITN) periodontal probe against the mesial and distal marginal ridges, the depth of each cavity preparation was determined to be 3 mm and 5 mm, correspondingly. On the enamel edge and then the dentin walls of each cavity, 37 percent phosphoric acid was applied for 15 seconds, washed off, and then gently dried. Dentsply, Detrey, Germany's Prime and Bond was used, and it was exposed to light for 20 seconds to cure. Before to the restorative operations, sectional matrices (Palodent plus, Dentsply) were used. The lottery approach was used to split the patients into two groups. Nano resin composites were put in group A using an incremental approach, while bulk filled resin composites were inserted in group B using a bulk filled technique. Using a VAS of 0 to 10, the post-operative pain level was assessed at 24 hours and seven days after surgery. (0: no pain; 1-3: minor discomfort; 4–7: medium discomfort; 8–10: severe discomfort). Every patient received instructions to complete a VAS scale at home. The Statistical Package for Social Science (SPSS) software, version 23.0, was used to analyse the data. For qualitative factors including gender, post-operative discomfort, tooth type, and efficacy, frequencies and percentages were determined. Chi square test was used to compare the efficacy of the two groups,

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with p=0.05 being seen as a significant value. With stratification, cofounders like gender and tooth type will be managed.

RESULTS

In this study 47 (42.7%) and 48 (43.6%) patients were male and 63 (57.3%) and 62 (56.4%) patients were female in group A (nano resin composite using incremental technique) and group B (bulk filled resin composite using bulk filled technique) respectively. On applying chi-square test p-value was 0.892 (non-significant) (Table 1).

Table 1. Patients distribution according to gender (n=220)

Gender	Group A	Group B	P-Value
Male	47 (42.7%)	48 (43.6%)	0.892
Female	63 (57.3%)	62 (56.4%)	
Total	110 (100.0%)	110 (100.0%)	

Enrolled patients tooth were grouped as; maxillary 1st premolar in 10 (9.1%) and 17 (15.5%) patients, maxillary 2nd premolar in 23 (20.9%) and 16 (14.5%) patients, maxillary 1st molar in 19 (17.3%) and 16 (14.5%) patients, maxillary 2nd molar in 4 (3.6%) and 4 (3.6%) patients, mandibular 1st premolar in 12 (10.9%) and 18 (16.4%) patients, mandibular 2nd premolar in 17 (15.5%) and 17 (15.5%) patients, mandibular 1st molar in 21 (19.1%) and 17 (15.5%) patients and mandibular 2nd molar in 4 (3.6%) and 5 (4.5%) patients in group A and group B respectively (Table 2).

Table 2. Patients distribution according to type of tooth (n=220)

Type of Tooth	Group A	Group B	P-Value
Maxillary 1st Premolar	10 (9.1%)	17 (15.5%)	0.71
Maxillary 2nd Premolar	23 (20.9%)	16 (14.5%)	
Maxillary 1st molar	19 (17.3%)	16 (14.5%)	
Maxillary 2nd molar	4 (3.6%)	4 (3.6%)	
Mandibular 1st Premolar	12 (10.9%)	18 (16.4%)	
Mandibular 2nd Premolar	17 (15.5%)	17 (15.5%)	
Mandibular 1st Molar	21 (19.1%)	17 (15.5%)	
Mandibular 2nd Molar	4 (3.6%)	5 (4.5%)	
Total	110 (100.0%)	110 (100.0%)	

Mean and standard deviation of post-operative pain after 24 hours was 2.39 ± 0.97 (1-5) and 2.32 ± 0.81 (1-4) in group A and group B respectively, p-value was 0.547 (non-significant). Mean and standard deviation of post-operative pain after 7 days was 0.14 ± 0.63 (0-3) and 0.00 in group A and group B respectively, p-value was 0.024 (significant) (Table 3).

Table 3. Mean and SD of postoperative pain

Mean ± SD	Group A	Group B	P-Value
After 24 Hours	2.39 ± 0.97	2.32 ± 0.81	0.547
After 7 Days	0.14 ± 0.63	0.00	0.024

Post-operative pain after 24 hours was distributed into; mild pain in 97 (88.2%) and 105 (95.5%) patients and moderate pain in 13 (11.8%) and 5 (4.5%) patients in group A) and group B) respectively (Table 4).

Table 4. Patients distribution according to post-operative pain level after 24 hours (n=220)

Pain	Group A	Group B	P-Value
Mild Pain	97 (88.2%)	105 (95.5%)	0.049
Moderate Pain	13 (11.8%)	5 (4.5%)	
Total	110 (100.0%)	110 (100.0%)	

Post-operative pain after 7 days was distributed into; no pain in 105 (95.5%) and 110 (100.0%) patients and mild pain in 5 (4.5%) and 0 (0.0%) patients in group A) and group B) respectively (Table 5).

Table 5. Patients distribution according to post-operative pain level after 7 days (n=220)

Pain	Group A	Group B	P-Value
No Pain	105 (95.5%)	110 (100.0%)	0.024
Mild Pain	5 (4.5%)	0 (0.0%)	
Total	110 (100.0%)	110 (100.0%)	

DISCUSSION

Post-operative sensitivity has increased with the introduction of posterior composite resin restorations and is now a common clinical issue [13]. Managing post-operative sensitivity may be challenging. Individuals frequently complained of sensitivity at various degrees and intensities, frequently without any obvious signs of the restoration's inadequacy [14, 15]. Technologies for composite resins and adhesives has advanced quickly. Considering these advancements, composite restorations' post-operative sensitivity remains a problem for clinicians [16]. Different studies from the world reports the different results regarding sensitivity associated with Resin Composite in Posterior Class 2 Restoration. When Opdam NJ [17] looked at premolar restorations that were planned for extraction utilizing two bonding agents and two composite implantation procedures, post-operative sensitivity was added as a secondary endpoint of concern. 14% of restorations showed sensitivity during the first recall, which lasted between 5 and 7 weeks, whereas 56% of restorations showed occlusal loading (mastication) sensitivity. A mix of Class I to Class V restorations totaling 356 were placed in 117 patients across 5 clinics for the clinical study of a novel RBC composition [18]. Significant sensitivity led to the replacement of 2% of the restorations overall, and another 5% of them still showed sensitivity after one week. 7% (4 of 57) of patients in another trial comparing RBC formulations experienced post-operative sensitivity; nevertheless, the study included no information on the severity of the problem [19]. Yet, in a 2-year clinical trial of RBC restorations with or without a flowable liner, there was no post-operative sensitivity found [20]. Yip et al identified at 1 week a cold sensitivity in 7% of restorations for one RBC formulation as opposed to 3% for another in a research assessing Class I and Class II

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restorations while employing the same dentin bonding agent [21]. Most recently, post-operative sensitivity caused 3% (1 each) of 35 Class I restorations of micro hybrid, packable, or nano filled composite restorations to be changed within six months (evaluated at baseline, 2 weeks, and 6 months post-operatively) [22]. Logistic regression revealed that the three variables used in the study—cavity depth, calcium hydroxide liner, and restorative material—had no statistically substantial impact on the emergence of pain or sensitivity in another study that included arbitrary utilization of a CaOH liner in 123 patients with 1 restoration each [23]. According to a research by Afifi et al, utilizing total-etch adhesive approach and self-etch adhesive approach, there was no statistically substantial difference between the two kinds of resin composites (bulk fill resin composite and incremental nano resin composite) after one day, one week, or one month [24]. Additionally, there was no statistically significant difference between the two adhesive systems after one day, one week, and one month when the two adhesive methods were tested utilizing incremental Nano resin composite and Bulk Fill resin composite. The reduced post-operative sensitivity was ascribed by Asghar et al to the bulk-fill composites' lesser post-gel shrinkage [25]. Nonetheless, it was noted that post-operative sensitivity is patient related, with variations in individuals' pain thresholds and levels of unpleasantness.

CONCLUSIONS

It was concluded from the study that bulk filled resin composite using bulk filled technique is more effective in class 2 posterior restorations in management of post-operative sensitivity as compared to nano resin composite using incremental technique measured post-operatively, at 24 hours and on 7th day post-operatively using Visual Analog Scale.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Role of Troponin-I in Predicting Length of ICU Stay in Post-Cardiac Surgery Patients

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ABSTRACT

The cardiac surgery procedures are associated with a release of enzyme troponin from the heart muscles. These troponin levels can be used to predict the post-operative outcomes. **Objective:** To find out the relationship between troponin I levels and length of ICU stay after open heart surgery. **Methods:** A total of 200 patients' data were collected from January to August 2022 at the cardiac surgery department of National Institute of Cardiovascular Diseases, Karachi. The study was conducted after the approval of Ethical Research Committee. Demographic characteristics of patients, procedure details and post-operative course was taken into account for this study. The troponin I levels were sent 12 hours after the surgery and their effect on ICU stay was studied. **Results:** The post-operative troponin levels were divided into different sets. There were 61% patients with troponin- I levels less than 9 ng/ml, 28% patients with troponin-I levels between 9 – 18 ng/ml and 11% patients with troponin-I levels of more than 18ng/ml. There was no difference in ICU stay between patients having troponin levels < 18ng/ml. They were all stable and their ICU stay comprised of 24 hours only. Whereas, in the group of patients having troponin levels > 18 ng/ml, the ICU stay was prolonged, extending to 48 - 72 hours. **Conclusions:** Serum Troponin levels can be used to predict the length of ICU stay. Higher Troponin levels > 18 ng/ml are associated with a prolonged ICU stay of more than 24 hours.

INTRODUCTION

Troponin is a protein found in the heart muscles. As the heart muscle is damaged, troponin is released into the blood. Therefore, greater the amount of damage higher the troponin levels will appear in the blood [1]. There is a rise in troponin levels after every cardiac operation. The type of operation, duration of cross-clamp time, type of cardioplegia, route of delivery and renal function tests all affect the post-operative troponin levels. Higher troponin levels signify the perioperative myocardial injury and are associated with major adverse cardiovascular events [2]. A cut off level of 0.8ng/ml has been roughly estimated to predict the adverse outcomes [3]. However, an exact value of post-operative troponin level to determine major adverse cardiovascular events has not been established yet. Recent studies and data calculate a higher threshold of post-cardiac surgery troponin levels. Devereaux *et al.*, studied the data of 13, 862 patients and concluded that estimated threshold value of cardiac sensitive troponin is 12, 981 ng/l (499 times the upper limit) within one day after surgery and 2503 ng/l (96 times the upper limit) two or three days after surgery [4]. Open Heart Surgery comprises different types of procedures. Most commonly done procedures in our setup include CABG and valvular surgeries. The serum Troponin I is sent 12 hours after every open-heart surgery as a part of other baseline investigations. The role of Troponins in patients with chest

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pain has a very diagnostic significance. However, in post-cardiac surgery patients, their role gets a bit different because some amount of troponin leak is common as heart undergoes various sorts of injuries during arrest, cross-clamping and manipulation. Troponin has a predictive role in determining repeat revascularization and major adverse cardiovascular events post-cardiac surgery [5]. In this study, we studied the role of post-operative troponin levels in predicting the length of ICU stay in patients in our hospital.

METHODS

The data were collected at National Institute of Cardiovascular Diseases, Karachi. All the post-operative open-heart surgery patients were included from the period of January, 2022- August 2022. A sample size of 200 was obtained from sample-size calculator with the population proportion kept at 39%, population size of 438 and a confidence interval of <5%. A sample of post-cardiac surgery patients was collected whose troponin levels post-operatively were sent after 12 hours. All the details were noted and they were followed up for a period of ICU stay. The study design used was Cross-Sectional Study. Non-probability, consecutive sampling technique was applied. Inclusion criteria stated : Either gender, Open heart surgery and Troponin levels done 12 hours after surgery. We excluded patients having closed heart surgery, Off-pump CABG, surgeries on Deep Hypothermic Circulatory Arrest and patients having pre-operatively deranged renal function tests. Two patients were excluded from the study. One was a DVR patient who had a post-operative depressed RV (TAPSE; 10mm and Serum Bilirubin: 5mg/dl. Post-operative troponin level was 8 ng/ml but the prolonged stay of 48 hours was to follow the trend of LFTs. Another patient of AVR (post-operative troponin: 21ng/ml) was excluded from data as he stayed 72 hours in ICU and the reason of prolonged stay was that he developed peritonitis and laparotomy was performed on the patient. These patients were excluded to remove the bias and the sample of 200 patients do not include the above-mentioned cases. Informed verbal consent was taken from patients. We categorized them on the basis of cardioplegia use as well. Their post-operative troponin levels were noted and the data were stratified into different groups. 1st group: Troponin levels < 9ng/ml (122), 2nd group: Troponin levels 9 – 18 ng/ml (56) and 3rd group (22) with Troponin levels > 18ng/ml. We measured the troponin I levels in our study. The troponin test was sent as a part of our routine tests in the hospital laboratory. Troponins are labelled as more significant markers of myocardial injury than LDH and AST [6], according to 'The Levels of Critical Care' [7]. Our definition of ICU Stay consists of "level 3 and level 2 critical care patients". Level 1 critical care patients are transferred to HDU and level 0 patients are kept in ward. Level 3 critical care includes patients requiring two organ support and level 2 includes critical patients requiring support for a single organ system. It is necessary to mention here that for now, our ICU set-up is having level 3 and 2 patients at same place, different from the standard which state that level 2 patients should be in HDU. Our HDU is getting equipped and soon level 2 patients will be in HDU. So, in this study, ICU patients and stay is based on both the level 3 and level 2 critical care patients. The data were collected and analyzed via SPSS version 23 (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp). Frequency was calculated by standard methods. Mean ± standard deviation was obtained for quantitative variables like age (years), Ejection Fraction (%), preoperative troponin levels (ng/ml), CPB time (minutes), cross-clamp time (minutes), and RFT's (mg/dl). Frequencies and percentages were calculated for categorical variables like types of operation and total number of conduits grafted. The independent sample t-test is applied to the measurement data. Statistical significance is kept at p<-0.05.

RESULTS

The study included 200 open-heart patients. The average age of patients was 52.35 ± 10.3 years. All the open-heart procedures were included: 80% CABG and 20% valvular operations (Table 1). 2 patients of CABG were reopened on the 0 post-operative day due to bleeding. IABP use was in 2 patients due to depressed ventricular function and poor targets. IABP was introduced after coming off bypass when the patient got hemodynamically compromised and inotropic support increased. The patient characteristics are discussed in Table 1.

Table 1: Patients Demographics

Variable	N = 200
Age	52.35 ± 10.3 years
Ejection Fraction	51.9 ± 10.5 %
Pre-op troponin levels	0.1 ± 0.2 ng/ml
Operation type	CABG: 80% (160)
	MVR: 10% (20)
	AVR: 5% (10)
	DVR: 5% (10)
Grafts	5 grafts: 10% (20)
	4 grafts: 30% (60)
	3 grafts 65% (130)
	2 grafts: 5 % (10)
Cardioplegia type	Saint Thomas: 85% (170)
	Delnido:15% (30)
Bypass time	147.96 ± 47.3 mins
Cross -clamp time	97.7 ± 38 mins
Renal Function tests (Serum Creatinine levels)	1.1 ± 0.7

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The serum troponin I levels were divided into different sets for easy analysis of data (Table 2).

Table 2: Troponin levels and length of ICU stay

Trop Levels	<9 ng/ml	9 – 18 ng/ml	> 18 ng/ml
%	61% (122)	28%(56)	11%(22)
Length of Stay	24 hours	24 hours	48 – 72 hours

There was no difference in length of ICU stay in patients whose troponin leak was less 18. However, the length of stay increased as the troponin level raised more than 18ng/ml (Figure 1).

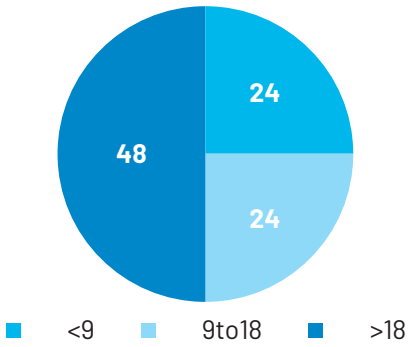

Figure 1: Troponin levels and length of ICU stay

The independent sample t-test is applied in Table 3 to find the significance value. The data shows that age, ejection fraction, pre-operative troponin, type of cardioplegia and serum creatinine play no role in determining the ICU stay. Postoperative serum troponin levels and aortic cross-clamp time played a significant role in predicting the length of ICU stay. Patients whose cross-clamp times were higher than 100 minutes had significantly higher chances of increased length of ICU stay. The aortic cross-clamp times less than 100 minutes played no role in lengthening the ICU stay.

Table 3: Demographic and preoperative clinical assessments of patients stratified by postoperative survival status

Patients	ICU Stay > 24 hours		p-value
	No	Yes	
Age	52.09 ± 10 years	53.90 ± 12 years	0.07
EF	51.7% (171)	53.2% (29%)	0.3
Total Bypass minutes	142 ± 39	182 ± 70	<0.001
Aortic cross clamp time	92 ± 33 mins	128 ± 50 mins	0.001
Renal Function Test	1.1 ± 0.16 mg/dl	1.0 ± 0.22 mg/dl	0.2
Cardioplegia	0.85 ± 0.3	0.83 ± 0.3	0.4
Post-Operative troponin	6.8 ± 4.6 ng/ml	19.54 ± 2.5/ml	<0.001

DISCUSSION

Our levels of serum troponin were higher than the range of the laboratory values. However, similar studies have reported that the cut off levels of troponin was several times higher than specified in the test kits because of unavoidable surgery related troponin release [8]. Omran *et al.*, in their study concluded that serum Troponin I levels sent earlier before 6 – 12 hours has poor prognostic value and a higher threshold of about 8000ng/l was associated with repeat revascularization within 48 hours after surgery. They recommended to use a higher threshold for serum troponin after the cardiac operation [9]. We tried to rule out the peri-operative Myocardial Infarction. The definition of perioperative MI includes either "autopsy findings of acute MI or an elevated level of a cardiac biomarker or enzyme and at least 1 of the following defining features: ischemic symptoms, development of pathologic Q waves, ischemic changes on electrocardiography, coronary artery intervention, or cardiac imaging evidence of MI" [10]. So, our patients had elevated cardiac biomarkers post-operatively but none of them developed any ECG changes or deteriorating clinical findings so chances of major peri-operative MI were ruled out. A study was conducted to determine the causes for post-operative troponin levels. It was concluded that age, previous cardiac surgery, pre-operative renal dysfunction, isolated CABG were independently associated with late elevations of cardiac troponin levels whereas isolated valvular procedures and cross-clamp time was associated with an early elevation of troponin levels. Complications like perioperative myocardial infarction, resuscitation, stoke, death and renal insufficiency was associated with both early and late rise of cardiac troponin levels [11]. Post-operative raised trop I levels 8 hours after surgery indicates post-operative hypoperfusion injury [12]. Al-Sarraf *et al.*, concluded by multiple logistic regression that cross-clamp time of more than 60 minutes is associated with increased post-operative low cardiac output, prolonged ventilation, blood transfusion, mortality and increased hospital stay [13]. OPCAB is associated with lower cardiac troponin levels than CCB irrespective of the stats of elective or urgent surgery [14]. Lehrke *et al.*, presented a series of 204 patients and reported that serum levels of 0.46ng/l after 48 hours of surgery are associated with a 4.9 fold increase in long-term death [15]. Another recent study on 11,847 patients received in emergency room found that reduced eGFR was a bigger predictor of elevated troponin level [16]. Lim *et al.*, in their study concluded that elevated troponin level without ECG changes was not independently predictive of ICU or hospital stay [17]. A research conducted on 48,629 patients concluded that increased BNP levels and cardiac troponin levels were associated with a prolonged length of hospital stay [18]. Retrospective data collection of 240 critically ill patients was performed and troponin levels were stratified into low <0.1ng/ml and intermediate levels of 0.1 ng/ml to 1.49 ng/ml and concluded that even borderline elevations are associated with increased length of ICU stay and mortality. However, they didn't associate elevated troponin levels with length of hospital stay [19]. Another study concluded that troponin levels alone can be used to predict outcomes after cardiac

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surgery [20]. All these studies from the literature complement our findings that cross-clamp times > 100 minutes are linked with a longer ICU stay and troponin levels > 18ng/ml are associated with a longer ICU stay.

CONCLUSIONS

Our study concludes that patients whose post-operative troponin was more than 18ng/ml had a longer ICU stay mainly because of inotropes needed to support the patient hemodynamically. Those having troponin levels of less than 18ng/ml and were in varying ranges did not determine a long ICU Stay. A patient having a troponin of 5ng/ml or 17 ng/ml behaved similarly in terms of length of ICU stay so it can be derived that troponin level of < 18 ng/ml does not predict a prolong ICU stay.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Practice of Modified Safety Measures for COVID-19 Adopted by Dental Health Care Providers and Barriers Faced

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ABSTRACT

The COVID-19 infection has influenced almost everyone belonging to every walk of life especially dental practitioners are introduced to a higher bet of getting infected because of close contact with such patients. The COVID-19 has put an enormous hassle on clinical benefits system across the globe. The dental practice is to highly needed change in accordance with the new scourge circumstance in order to reduce the risks of SARS-CoV-2 infection transmission. **Objective:** To investigate practice of modified safety measures by the dentists regarding COVID-19 outbreak. **Methods:** Descriptive cross-sectional study was conducted among dentists working at Institute of dentistry Liaquat University of Medical and Health Sciences Jamshoro, Dental outpatient department of Hyderabad, and private dental practitioners of Hyderabad city, Pakistan by convenience sampling technique. The analysis of data were conducted using SPSS version 23.0 after adjusting the potential confounders and to analyze association between dentist response and age, gender, and other characteristics by applying Chi-Square test. **Results:** Most of the dental professionals are scared of developing COVID-19 from a patient or co-worker (83.17%) and are well known about its transmission (93.36%) and use PPE (74.17%). **Conclusions:** Although having a high valuable level of knowledge and practice, dental practitioners around the world are in a state of anxiety and dread while working in their respective fields due to the COVID-19 pandemic impact on mankind.

INTRODUCTION

A pandemic outburst of novel corona virus (COVID-19) originated from Wuhan, China, Hubei Province, and has spread globally [1]. It is single-stranded enclosed RNA virus of Coronaviridae family. Moreover, the WHO declared it a worldwide pandemic illness on 11th March-2020. SARS-Cov2, being zoonotic virus, may pass from animals to people with incubation period of two-week. Symptoms include cough, weariness, fever, dyspnea, ageusia, anosmia [2]. The pandemic's major infectious mechanisms include direct contact and airborne transmission. Droplets discharged during exhalation, coughing, or sneezing cause airborne contagions, whereas direct infection is caused by contact with infected oral mucosa, nose surface, or eye surface [3]. A greater proportion of doctors seem to have contracted the illness while working with infected patients. A comparable danger of transferring and getting the illness exists in the dentistry profession. Dentists are subjected to infections present in patients' dental cavities as well as pulmonary tracts during treatments involving close proximity including face-to-face contact, as well as the use

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of AGPs [4-7]. Dentists have among the highest COVID-19 infection rates of any medical specialty. The use of gloves, face masks, and hand hygiene practices comprising frequently hand washing using water & soap or with alcohol-comprising hand sanitizers have been advised as universal precautions /methods for reducing the transmission of the virus. Full-face shields, eye protection, fluid-resistant disposable gowns, and FFP respirators are among the other improved PPE options [8-10]. Health and Government organizations throughout the world, including Pakistan, have kept up with unique standards for each location and enacted rigid policies to battle the pandemic, mostly by lowering the risk of transmission [11]. The new coronavirus has provided a variety of obstacles to the safe practice of dentistry, since all conventional dental offices were closed during the pandemic as well as their everyday activity schedules were updated and adapted to reduce the possible hazards from a perplexing and masked opponent [12-15]. Dental crises, on the other hand, need dentists taking care, especially since the WHO declared it as a public health emergency on 30th January 2020. The only method to protect dental practice is to use modified protective measures [16-20]. A considerable number of practicing dentists are reported to develop COVID-19 in current pandemic, making it critical for them to adequately implement safety precautions against this lethal virus. The current study is expected to contribute to the field of dentistry by exploring the protective measures taken by dental health care providers and the challenges they experienced in dental practice during the pandemic. It will additionally be advantageous in the future to supply material to the dentist profession so that they may effectively battle dental emergencies in their clinics in pandemic by following all of the updated methods and carefully recommending standard operating procedures. The study also aims to assess the socio-demographic barriers that dental practitioners experience in implementing updated infection-prevention techniques.

METHODS

Descriptive Cross-sectional Study was conducted at Institute of Dentistry Liaquat University of Medical and Health Sciences Jamshoro & Dental Out Patient Department Hyderabad, Private dental practitioners of Hyderabad city by non-probability convenience sampling method within six months of duration i.e., from 18th March 2021 to 17th September 2021 after approval by the Institutional Research Ethics Committee of LUMHS Jamshoro. (NO.LUMHS/REC/-55).Questionnaire was developed and distributed among participants to gain the responses after getting sign on written consent form. Consultants, Postgraduates, House Officers were included in this study and new dental practitioners, dentists involved in malpractice and dentists not working on clinical practice were blocked from the review. Due to dearth of literature on this aspect of research, we take proportion of dental practitioners experiencing various barriers against safe & modified safety practices for prevention of COVID-19 as 50%. The following formula is used to compute the sample size for this research:

$n = Z^2 \times p \times q / e^2$

Where:

n= Prerequisite sample size

e= Margin of error at 5% and 95% confidence interval level and 10% of non-responders, incomplete filling questionnaire, the sample size is 422. After the approval from Research Ethics Committee, the data were collected from the dentists, house officers, postgraduates, consultants and written consents from the respondents before participating in the study was taken. The subjects, who fulfilled the inclusion criteria, fill the questionnaire and were recruited in this study. Data were entered in SPSS version 23.0 for windows. The frequency calculations were done for categorical variables including gender and different barriers adopted for safety measures for COVID-19. The Chi-square test was used to seek the associations between the research participants' socio-demographic factors and the hurdles they experienced. p-value <0.05 was considered significant.

RESULTS

The demographic information of the participants is presented in Table 1. Out of a total of 422participants, 261 were male and 161 females, with ages between 23 and 50 years. By designation, 90 were House officers, 138 general dentists, 144 postgraduates and 50 consultants (Table 1).

Table 1: Demographic Profile of Study Subjects

Demographics	Attributes	Frequency (%)
Age (Years)	23-28	210 (49.76)
	29-34	180 (42.65)
	35-40	20 (4.73)
	41-45	8 (1.86)
	46-50	4 (1.00)
Gender	Male	261 (61.85)
	Female	161 (38.15)
Designation	House officers	90 (21.32)
	General dentists	138 (32.70)
	Postgraduates	144 (34.12)
	Consultants/Specialists	50 (11.86)

In Table 2 there is a description of the practice of modified safety measures and awareness of dental healthcare professionals regarding COVID-19; 83.17% of respondents were frightened of acquiring COVID-19 from any co-worker or patient. More than 90% of participants are notable about COVID-19 transmission routes. Similarly, 74.17% have used PPE in their dental practices, 68.95% recorded every

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patient's body temperature before doing dental procedures, and 77.25% ask for PCR-Test COVID-19 from patients who disclosed suspicious signs and limited their clinical work for emergency cases. Ninety percent of dentists reported that their profession was negatively affected by this outbreak. Barriers faced by the participants during COVID-19, 97.86% presents 74.17% provide hand sanitizer to their patients as they enter in the dental clinics and use PPE in their clinics.58.06% deferred dental treatment of patients indicating dubious signs.

Table 2: Knowledge, Practice Modification & Barriers About COVID-19

Question	Frequency (%)
Are you scared of developing COVID-19 from a patient and co-worker?	Yes=351 (83.17)
	No=40 (9.47)
	Sometimes=31 (7.36)
Have you used hand sanitizer and personal protective equipment (PPE) in your dental practice?	Yes=313 (74.17)
	No=19 (4.50)
	Sometimes=90 (21.33)
Are you familiar with mode of transmission of COVID-19?	Yes=394 (93.36)
	No=28 (6.64)
Do you use a thermo gun for taking body temperature of each patient before entering in dental office?	Yes=291 (68.95)
	No=53 (12.55)
	Sometimes=78 (18.50)
Are you conceding treatment of patients showing dubious indications?	Yes=245 (58.06)
	No=93 (22.30)
	Sometimes=84(19.64)
Are you taking report of PCR-test of COVID-19 earlier than treatment from every suspected person and confined your practice to mainly emergency procedures?	Yes=326 (77.25)
	No=35 (8.29)
	Sometimes=61 (14.46)
Has COVID-19 pandemic had a negative impact on your profession?	Yes=382 (90.52)
	No=40 (9.48)

In Table 3 there is a description of the practice of modified safety measures and association of age of respondents.

Table 3: Association of Age of Participants

Question	Age (Years)	Response	p-value
Are you scared of developing COVID-19 from a patient and Co-worker?	23-28	Yes=351	≤ 0.00
	29-34	No=40	
	35-40	Sometimes=31	
	41-46		
	47-50		
Have you used hand sanitizer and personal protective equipment (PPE) in your dental practice?	23-28	Yes=313	≤ 0.01
	29-34	No=19	
	35-40	Sometimes=90	
	41-46		
	47-50		
Are you familiar with mode of transmission of COVID-19?	23-28	Yes=385	≤ 0.01
	29-34	No=37	
	35-40		
	41-46		
	47-50		
Do you use a thermo gun for taking body temperature of each patient before entering in dental office?	23-28	Yes=291	≤ 0.01
	29-34	No=53	
	35-40		
	41-46	Sometimes=78	
	47-50		
Are you conceding treatment of patients showing dubious indications?	23-28	Yes=245	≤ 0.07
	29-34	No=93	
	35-40	Sometimes=84	
	41-46		
	47-50		
Are you taking report of PCR-test of COVID-19 earlier than treatment from every suspected person and have you confined your practice to mainly emergency only?	23-28	Yes=307	≤ 0.06
	35-40		
	29-34	No=43	
	35-40		
	41-46	No=43	
	47-50	Sometimes=72	
Has COVID-19 pandemic had a negative impact on your profession?	23-28	Yes=382	≤ 0.00
	29-34	No=40	
	35-40		
	41-46		
	47-50		

In Table 4 there is a description of the practice of modified safety measures and association of gender of respondents.

Table 4: Association of Gender of Participants

Question	Response	Male	Female	p-value
Are you scared of developing COVID-19 from a patient and Co-worker?	Yes	210	141	0.001
	No	32	8	
	Sometimes	19	12	
Have you used hand sanitizer and personal protective equipment (PPE) in your dental practice?	Yes	181	132	0.002
	No	10	9	
	Sometimes	70	20	
Are you familiar with mode of transmission of COVID-19?	Yes	233	152	0.001
	No	28	9	
Do you use a thermo gun for taking body temperature of each patient before entering in dental office?	Yes	178	113	0.001
	No	33	20	
	Sometimes	50	28	
Are you conceding treatment of patients showing dubious indications?	Yes	137	144	0.00
	No	42	13	
	Sometimes	82	4	
Are you taking report of PCR-test of COVID-19 earlier than treatment from every suspected person and confined your practice to mainly emergency procedures only?	Yes	165	142	0.01
	No	35	8	
	Sometimes	61	11	
Has COVID-19 pandemic had a negative impact on your profession?	Yes	224	158	0.00
	No	37	3	

DISCUSSION

Because of the increase of aerosols when conducting dental medications in their working conditions, dental experts have been shown to be at a significant risk of being infected with COVID-19 [21]. The present cross-sectional study demonstrated dental experts' anxiety and dread when humming in the midst of the present viral episode. For this investigation, a questionnaire-based

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survey was used to gather information on dental specialists' fear and any training changes made to combat the COVID-19 flare-up pandemic. COVID-19's influence, which has gripped a massive number of lives on a worldwide scale, ranging from scattered and concealed to tragedy, has caused dread. Because of its long hatching time (approximately upto14 days), it's challenging to determine an individual's susceptibility to infection [22-25]. The research was divided into three sections and based on a survey. Segment 1 focused on socio-demographic representation: age, gender, and job title. The majority of respondents were males and females (61.85% and 38.15% respectively). The population ranged in age from 23 to 50 years old and included General Dentists, Postgraduates, House Surgeons, and Consultants. Part 2 focused on the education of the dental professionals' changing security assessments throughout the viral episode: In addition, contrary to our findings, Fallahi *et al.*, said that confronting COVID-19 outbreak threat, majority of dentists were worried concerning their families as well as concerning themselves, and similar results were reported in a review conducted amongst dental specialists of Turkish community [25, 26]. The Part 3 of research looked into the challenges faced by pandemic victims. In dentistry centers, the majority of members had made patient wellness and COVID-19 balancing a priority. The majority of dental professionals are willing to treat any patient who details negative consequences. The way patients are welcomed into the dentist office has also altered; 67.29% of participants hand sanitizer to their patients upon arrival. While a review performed in Brazil by González-Olmo *et al.*, indicated that (64.6%) members attended to merely urgencies, and 58.5% offered dental attention without staff, 58.06% of responders have linked their schooling to essentially crisis systems [27]. The ADA, CDC, and WHO have proposed practical regulations for dental experts and dental personnel to restrict the spread of COVID-19 [18-20]. According to Martina *et al.*, and Li *et al.*, PPE, hand washing, a thorough patient assessment, rubber dam isolations, anti-retraction hand pieces, mouth flushing prior to dental treatments, and center sanitization are all included [28-31]. The viability and accessibility of personal protective equipment (PPE) is a crucial factor of the threats that are posed to medical professionals. Similarly, Goswami and Chawla discovered that 92.9% of dentists use personal protection equipment such masks, goggles, and gloves, and 96.2% clean their hands often using antiseptics containing alcohol and water and soap [32]. Moreover, Khader *et al.*, revealed that even though Jordanian dental professionals were aware of COVID-19 symptoms, infection control, transmission mode, and precautions in dental clinics; the increased level of suspicion was evidenced as a necessity to shut down their practices, which could have had basic financial implications [33]. A study conducted by Wang *et al.*, in a dental urgent work space in Beijing, China, found that the COVID-19 pandemic has had an effect on the prevalence of dental prescriptions that has decreased in the grip division as compared to pre-COVID-19 levels. In the aftermath of the COVID-19 pandemic, there has been less dental injury, and the degree of dental and oral sickness has increased, while non-centrality and dental injury have reduced [34]. The burden on medical services system and the costs associated with medication also puts one's mind under strain, which can result in a significant financial burden. As previously stated, further protections are required, including careful pre-testing of individuals and other steps if treatment for patients with confirmed COVID-19 is deemed critical. According to the American Dental Association's most recent report, dental professionals around the country should postpone elective dental procedures for the next three weeks as well as focus on crisis care [35-37].

CONCLUSIONS

The research aiming at exploring modified safety measures adopted by dental health care providers concludes that they face many obstacles in adopting safety measures. The 83.17% of the participants are scared of contracting COVID-19 infection for their patients. This has resulted in confining themselves to practice in the emergency procedures (58.06%). The barriers faced by dental health care providers have significant associations across all groups of age, gender (p-value ≤0.01). Because of the quickly changing circumstances, more research into the effects of COVID-19 in dental practice is needed.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Frequency of Preeclampsia in Pregnant Women Presenting in A Tertiary Hospital

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ABSTRACT

Preeclampsia is pregnancy specific disorder that involves endothelial dysfunction and vasospam, so it needs prompt diagnosis and expert management as both mother and fetus are at risk. **Objective:** To determine the frequency of preeclampsia in pregnant women presenting in a tertiary hospital. **Methods:** This Cross-Sectional study was done in Department of Obstetrics and Gynecology, Unit-II ward-9, Jinnah Postgraduate Medical Centre, Karachi from 6th April 2018- 10th November 2018. We included 340 pregnant females fulfilling the inclusion criteria. Informed consent was taken. The data were collected on prepared performa. **Results:** A total of 340 pregnant women were included in this study, mean age of patients was 28.3 ± 3.5 (16-30) years and mean gestational age in patients was 33.6 ± 5.2 in weeks. 49(14.4%) patients had pre-eclampsia while 291(85.6%) pregnant women were normotensive. **Conclusions:** Our results show patient with preeclampsia are at increased risk for morbidity and mortality of both new born and mother, so proper antenatal workup is required.

INTRODUCTION

Preeclampsia (multisystem disorder) is a serious pregnancy complication which mainly occurs after 20 weeks of pregnancy. It is defined as raised blood pressure along with proteinuria in previously normotensive patient. The incidence of preeclampsia ranges from 2% to 6% of all pregnancies. While the global incidence is bit higher and ranges from 5%to 14%. In developing nations, the incidence of disease is reported from 4% to 8%and being the second most common cause of still birth and early neonatal deaths in these countries [1]. Many features make preeclampsia as severe and life threatening like systolic blood pressure more then 160mmhg, impaired hepatic function indicated by elevated liver enzymes, progressive renal insufficiency, pulmonary edema and thrombocytopenia [2]. Proteinuria is defined as presence of at least 300mg of protein in 24-hour urine collection. Preeclampsia is characterized by endothelial dysfunction so it usually leads to multisystem disorder [3, 4]. It may involve cardiovascular system resulting in to hypertension, may lead to thromboembolism may present with deep venous thrombosis or stroke. Although hypertension is the most common presentation. Number of maternal and fetal risk factors are involved in the pathophysiology of preeclampsia like prim paternity, limited sperm exposure,

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pregnancy after donor insertion, extreme of maternal age, preeclampsia in last pregnancy, family history of preeclampsia, hydrophobic degeneration of placenta, insulin resistance, gestational diabetes mellitus, multi-fetal gestation and obesity [5]. So, preeclampsia needs prompt diagnosis and expert management. Due to paucity of local data we have done this study to determine the frequency of preeclampsia in our hospital to make local guidelines for better management of patient.

METHODS

This Cross-Sectional study was done in Department of Obstetrics and Gynecology, Unit-II ward-9, Jinnah Postgraduate Medical Centre, Karachi from 6th April 2018 to 10th November 2018. By using WHO calculator with confidence level of 95% with error of margin 1.6% and anticipated Population around 2.31% sample size is 340. We enrolled patients 340 patients by using Non-probability, consecutive sampling of age of patients 16-30 years, normal BP at enrollment, singleton pregnancy and gestional age must be ≥ 20 weeks. We excluded patients with baseline hypertension, patients with baseline proteinuria (>300 mg of protein in a 24-hour urine collection), Patients with baseline renal disease as per record of patient, Multiple pregnancy as per record of patient, Maternal heart disease like Myocardial infarction, ASD (atrial septal defect) as per record of patient, Chromosomal abnormalities or foetal abnormalities suspected on ultrasound as per record of patient and use of medication other than iron supplements as per record of patient. 340 pregnant females admitted were randomly selected included in the study as per inclusion criteria. Advantages and disadvantages were discussed with family and the patient. Preeclamsia is laballed when ssystolic blood pressure of more than 140 mmHg and diastolic blood pressure of more than 90 mmHg in previous normotensive women and new-onset proteinuria >300 mg of protein in a 24-hour urine collection after 20 weeks' gestation. Informed consent were done and complete demographic and clinical data were collected. After overnight fasting, venous blood samples from patients were obtained from upper extremities preferably right upper arm cubital vein to measure hemoglobin, liver function test and 24-hour urine collection for proteinuria assessment. The data were analyzed on SPSS version 18.0. The age, gestational age, and BMI were expressed in mean ± SD. Residence, anemia, diabetes mellitus, smoker and Preeclampsia were presented as frequencies along with percentages. Effect modifiers age, gastational age, BMI, residence, anemia, diabetes mellitus, smoker were controlled through stratification. Post stratification chi-square test applied to observe their effect on the preeclampsia. Statistical significance were considered at p-value ≤0.05.

RESULTS

A total of 340 pregnant women were included in this study, mean age of patients was 28.3 ± 3.5 (16-30) years. Mean BMI of the patients was 25.4 ± 4.1, mean gestational age in patients was 33.6±5.2 in weeks as shown in table 1.

Table 1: Descriptive Statistics of Demographic Characteristics

Variables	n	Minimum	Maximum	Mean
Age	340	16	30	28.3
BMI	340	22.1	29.9	25.4
Gestational age	340	29.1	39	33.6

There were 106(44.1%) with anemia, 88(25.9%) patients have diabetes mellitus. 58(17.1%) patients were from smokers, 163(47.9%) patients were from rural area and 177(52.1%) patients were from urban area as shown. Out of 340 pregnant women 49(14.4%) patients had pre-eclampsia while 291(85.6%) pregnant women were normotensive as shown in table 2.

Table 2: Descriptive statistics of clinical characteristics

Variables		Frequency (%)
Anemia	Yes	105(44.1)
	No	190(55.9)
Diabetes mellitus	Yes	88(25.9)
	No	252(74.1)
Smokers	Yes	58(17.1)
	No	282(82.9)
Residential Status	Rural	163(47.9)
	Urban	177(52.1)
Preeclampsia	Yes	49(14.4)
	No	291(85.6)

Stratification for pre-eclampsia was done with respect to effect modifiers age, gestational age, BMI, anemia, diabetes mellitus, smokers and residential status using chi -square test at level of significant 0.05. as shown in table 3.

Table 3: Stratification for pre-eclampsia with variable

Variables		Pre-Eclamptic N=49	Normal N=291	Total	p-value
Age	≤25 yrs	19(13.1%)	126(86.9%)	145	0.55
	>25 yrs	30(15.4%)	165(84.6%)	195	
Gestational age (in weeks)	≤32	25(16.3%)	128(83.7%)	153	0.36
	>32	24(12.8%)	163(87.2%)	187	
BMI	≤25 kg/m2	15(10.9%)	123(89.1%)	138	0.12
	≤25 kg/m2	34(16.8%)	168(83.2%)	202	
Anemia	Yes	32(30.5%)	73(69.5%)	105	0.0001
	No	17(8.9%)	173(91.1%)	190	
Diabetes mellitus	Yes	29(33%)	59(67%)	88	0.0001
	No	20(11.5%)	232(88.5%)	252	
Smokers	Yes	22(37.9%)	36(62.1%)	58	0.0001
	No	27(9.6%)	255(90.4%)	282	
Residential Status	Rural	28(17.2%)	135(82.8%)	163	0.16
	Urban	21(11.9%)	156(88.1%)	177	

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DISCUSSION

A major pregnancy condition known as preeclampsia (multisystem illness) typically develops after 20 weeks of pregnancy. Preeclampsia affects 3-8% of pregnant women and accounts for 20% of maternal deaths, preterm birth and perinatal mortality each year worldwide. In the UK, it makes about 4-6% of pregnancies more difficult. The third most common cause of maternal death and morbidity in the world is preeclampsia [6]. The World Health Organization (WHO) has estimated that preeclampsia kills over 60,000 women worldwide year, accounting for 11% of deaths in the United Kingdom and 24% of all maternal deaths in India. The strongest risk factor for preeclampsia in subsequent pregnancies is the first pregnancy, where the chance of preeclampsia is 4.1% [7, 8]. Preeclampsia recurrence rates have been reported to range considerably from 0-5% and even up to 65%. Preeclampsia's pathogenesis is still mostly unclear. It has been proposed that maternal endothelial dysfunction, which manifests clinically as hypertension, proteinuria, and edoema, is caused by a soluble substance or components that are reduced by placental synthesis as a result of early placental ischemia. Pregnancy delivery is the only known treatment for pre-eclampsia, however the choice of whether to monitor the mother or deliver the baby is crucial for both the mother's and the fetus's welfare. Antiplatelet aspirin therapy, which lowers the incidence of pre-eclampsia by 10% in women who have at least one risk factor, is the foundation of secondary prevention [9]. There is presently no study that can be used to determine the precise dosage or the ideal timing to start taking aspirin. However aspirin should be started as soon as feasible, i.e., before 12–14 weeks, which corresponds to the start of the trophoblast invasion's first phase. Aspirin's effectiveness has only been demonstrated in women who had pre-eclampsia in the past that was accompanied by intrauterine growth retardation and who were thrombophilic-free [10, 11]. In this study mean age of patients was 28.3 ± 3.5 (16-30) years with mean gestational age in patients was 33.6 ± 5.2 in weeks. In our study 49(14.4%) patients had pre- eclampsia, while similar results were also seen in Guerrier *et al.*, who enrolled 1257 women and observed 419 (16%) women had preeclampsia this finding was inconsistent with the study conducted at Northern Finland by Kaaja *et al.*, who found preeclampsia in about 13.9% [12, 13]. While the results from the study by Agrawal *et al.*, in India shows the presence of preeclampsia up to 28% with variation in different regions, similarly, study by Akter and Khanum shown vey higher number up to 44% this may be due to the most of women enrolled was in third trimester [14, 15]. Although preeclampsia varies he prevalence from 1.8 to 16.7% in developing countries, and our finding figure is near to upper value [16]. Interestingly figures from china and japan up to 0.59% lies closer to lower value one reason of higher number in developing countries like us might be lower concern about health and lack of facilities [17]. In this study preeclampsia was more observed in patients with diabetes mellitus vs non-diabetic (59.1% vs 40.8%) with significant p-value, this may be diabetic patients more prone to develop endothelial dysfunction, similar finding was also observed in other studies where diabetes was strong risk factor for preeclampsia [18, 19]. We have also observed that preeclampsia was more in women with rural background vs urban (57.1% vs 42.8%) was statically insignificant similarly study by Moussa *et al.*, was also supportive to these findings [20].

CONCLUSIONS

The study gives new insight of increasing trend in pre-eclampsia over the years that needs proper understanding of pathophysiology and major risk factors for the development of preeclampsia. This study also warns for antenatal checkup as there was more preeclampsia as observed in patients with rural background. More studies are suggested in future for much better understanding.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Predictive and Protective Role of Grit, Internal Locus of Control and Social Support in Mental Health of Cardiac Patients

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ABSTRACT

Individuals diagnosed with cardiac diseases often experience poor mental health outcomes. However, grit, social support and internal locus of control can provide protective effects against poor mental health in patients diagnosed with cardiovascular diseases. The purpose of the present study was to assess the predictive and protective role of grit, internal locus of control and social support with regard to mental health of cardiac patients. A total of 250 cardiac patients had been sampled comprising 130 males and 120 females in the age range of 30 to 70 years selected through purposive sampling. Data collection was done using Rotter's Locus of Control Scale, Multidimensional Scale of Perceived Social Support, Duckworth Grit Scale and DASS-21. Data analysis was done using Pearson correlation and regression analyses using dummy coding. Results showed that among cardiac patients, being a male in the age range of 30 to 45 years of age, being married, having higher levels of education, higher scores on grit with an internal locus of control is associated with improved mental health. It is thus concluded that having an internal locus of control, higher levels of social support and being gritty is associated with improved mental health outcomes in cardiac patients.

INTRODUCTION

According to the World Health Organization (WHO), the prevalence of heart disease in Pakistan is estimated to be around 10 percent [1]. This is higher than the global average, which is estimated to be between 5 and 7%. Pakistan is considered to be one of the most populous countries in South Asia, and it is estimated that around 30 million people have some form of heart disease [2]. Patients with cardiac diseases are exposed to a wide range of psychosocial stressors including depression, acute stress and anxiety [3]. Depression is a common mental health disorder that can have a significant impact on the physical health of those affected [4]. Recent research has identified a strong link between depression and cardiac diseases, with people suffering from depression being twice as likely to develop cardiovascular diseases than those without it [5]. Similarly, stress is a response to a perceived threat, such as a medical diagnosis or a health-related event. It can cause physical and emotional changes, such as increased heart rate and blood pressure, fatigue and insomnia [6]. Chronic stress can lead to long-term

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health problems, such as depression, heart disease and diabetes [7]. Research has also shown that anxiety can also be a common problem among cardiac patients [8]. It can manifest as feelings of fear or worry and can be triggered by physical or emotional events. Moreover, anxiety can result in increased heart rate and blood pressure as well as fatigue and difficulty concentrating [9]. Research suggests that there are several risk factors that increase the likelihood of developing both depression and cardiac diseases [10]. These include age, gender, lifestyle factors (such as smoking or lack of exercise), and pre-existing medical conditions (such as hypertension and diabetes) [11]. In addition, there are several psychological factors that can increase the risk of both depression and cardiac diseases, such as stress, anxiety, and a lack of social support [12]. However, there are a number of factors that can play a protective role with regard to depression in cardiac patients [13]. Social support is defined as "the aid, comfort, and encouragement one receives from family, friends, and/or professional caregivers" [14]. It is generally accepted that social support has a positive effect on mental health and can help reduce the risk of depression in cardiac patients [15]. Several studies have been conducted to examine the role of social support in reducing the risk of depression in cardiac patients [16]. Research has demonstrated that having a high level of social support is correlated with a decreased risk of depression [17]. This study showed that having a strong support system from both family and friends was associated with a lower depression risk. The authors concluded that a robust social network can be beneficial in decreasing the risk of depression among cardiac patients. Additionally, Amedro et al. conducted a study of 460 cardiac patients and found that social support was associated with a lower risk of depression [18]. The investigators concluded that social support is an important factor in reducing the risk of depression in this population. The results of this research suggest that having a strong social network can help reduce the risk of depression in cardiac patients. Not unlike social support, grit has been identified as providing protective effects against depression and improved physical health outcomes in patients [19]. In the context of cardiac rehabilitation, grit has been linked to better physical and psychological outcomes for patients. For example, one study found that higher levels of grit were associated with fewer hospitalizations and better quality of life [20]. Another study found that higher levels of grit were associated with increased adherence to lifestyle interventions, such as exercise, smoking cessation, and dietary changes [21]. However, the protective effects of grit and social support against depression and other psychopathologies may also mediated on the basis of an individual's locus of control. The locus of control of an individual is defined as the extent to which individuals perceive their outcomes to be a result of their own behavior or due to external factors [22]. In other words, it is the degree to which someone believes they are in control of their own destiny. In terms of mental health, the locus of control can play an important role in the psychological well-being of individuals, including those with cardiac conditions [23]. The findings of the study further showed that individuals with an internal locus of control, those who believe they are in control of their own destiny, are more likely to have positive mental health outcomes than those with an external locus of control, who believe their outcomes are due to luck or external forces [24]. This is especially true for cardiac patients, who often experience a range of stressors such as pain, disability, and lifestyle changes that can negatively impact their mental health. In contrast, those with an external locus of control often feel helpless and powerless in the face of chronic diseases [25]. The main aim of the study was to assess the role of grit, social support and locus of control in mental health (depression, stress and anxiety) of cardiac patients. Another aim of the study was to assess the gender differences among the participants on depression, social support, LOC and grit. Moreover, the study focused on assessing the gap in literature on this area and to develop a comprehensive model on these constructs. The primary purpose of this study is to explore the relationship between grit, social support, locus of control, and depression in cardiac patients. This study sought to determine whether higher levels of social support, grit and internal locus of control are associated with lower levels of depression in cardiac patients. This research is important, as it could provide insight into the psychological factors that influence the ability of cardiac patients to cope with the challenges of living with a serious health condition. Additionally, the findings could inform interventions designed to reduce depression in this population.

METHODS

A cross sectional correlational design of research was used to assess the relationship among grit, social support, mental health and locus of control. The sample of the study comprised of 250 cardiac patients including 130 males and 120 females in the age range of 30 to 70 years of age, all of whom were selected through purposive sampling. G power analysis to assess the sufficient sample size for the study with a confidence interval of 95 %. The analysis showed that a sample size of 250 was justified for achieving satisfactory effect sizes. Moreover, the margin of error when estimating the sample size was kept down to a minimal. The Rotter Locus of Control Scale (RLOCS) is a

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self-report questionnaire designed to measure an individual's level of locus of control [26]. The scale consists of twenty four items, each of which is answered on a four point Likert-type scale. It is used to assess a person's internal locus of control (a belief that they can control their own destiny) and external locus of control (a belief that external factors will determine one's success or failure) [27]. The reliability of the RLOCS has been studied extensively, with Cronbach's Alpha (a measure of internal consistency) ranging from 0.77 to 0.90 [28]. The total score is calculated by summing all of the individual item scores and is used to indicate a person's level of psychological well-being and to help diagnose psychological disorders. A score of 24 or less indicates an external locus of control, a score of 25-48 indicates an intermediate locus of control, and a score of 49 or higher indicates an internal locus of control. In accordance with the findings of the present study, the scale showed a reliability of .79 which falls within the acceptable range. The Depression Anxiety and Stress Scale (DASS) is a psychological assessment tool used to measure the severity of depression, anxiety, and stress in individuals [29]. The DASS consists of 42 questions that are each assigned a score from 0 to 3, with 0 being no symptoms, 1 being mild symptoms, 2 being moderate symptoms, and 3 being severe symptoms. The total score is calculated by adding up the scores for each item. A score of 0-9 is considered to be normal, 10-13 is considered to be mild, 14-20 is considered to be moderate, and 21-42 is considered to be severe. The DASS has been found to have good reliability and validity, with Cronbach's alpha values ranging from 0.84 to 0.91 for the total score, and 0.82 to 0.86 for the three subscales. Test-retest reliability for the DASS is also high, with correlations ranging from 0.71 to 0.85 for the total score, and 0.67 to 0.77 for the subscales. The DASS is thus a reliable tool for assessing the mental health of participants. In accordance with the results of the present study, DASS had shown accepted levels of reliability i.e. .86. The Multidimensional Scale of Perceived Social Support (MSPSS) is a 12-item self-report measure designed to measure the perception of social support in adults. It was developed by Zimet *et al.*, [30]. The scale consists of 12 items, each scored on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). A score is calculated for each item by summing all the responses to the 12 items and then dividing the total by 12 to get the average score. The higher the score, the greater the perceived level of social support. The MSPSS has been widely used to assess the perceived social support in adults and has been found to have good psychometric properties. It is also useful in evaluating the effectiveness of interventions designed to improve social support, and in exploring relationships between perceived social support and other psychological variables. The MSPSS has a reliability coefficient of .76, indicating that it is a reliable measure of perceived social support [31]. The results of the present study showed that social support scale had .85 level of reliability which shows that it falls within the acceptable range. The Grit Scale is a self-assessment tool designed to measure an individual's level of "grit" or resilience, which is the determination and stick-to-itiveness needed to achieve long-term goals [32]. The scale asks questions about one's commitment to a goal, how often one perseveres in the face of difficulties, and how one views one's own potential. The scale also assesses how often someone makes excuses for not taking action and how often one bounces back from setbacks. The higher the score on the Angela Grit Scale, the higher the individual's level of grit. The reliability of the Angela Grit Scale has been assessed in a number of studies. The Angela Grit Scale scoring system is based on a scale of 1 to 5, with 1 being the lowest score and 5 being the highest. A score of 1 indicates that the respondent has little to no grit, while a score of 5 indicates that the respondent is highly gritty. This suggests that the scale is internally consistent, or that the items on the scale measure the same construct. In the same study, the test-retest reliability was found to be .81. In the present study, the findings showed a reliability of .75 which is indicative of an acceptable level of reliability. The content validity of the scales had been assessed by two independent experts one of whom who was a practice healthcare expert while the other one was a certified clinical psychologist working in an healthcare setting. The experts analyzed the scales for their suitability for cardiac patients and found the scale to be valid. Moreover, convergence validity of the scales was used through analysis of the average variance. Specifically, correlation of item factors were analyzed for the locus of control scale and its subscales, grit scale, social support and DASS. AVE index was calculated in accordance with the approach recommended by Fornell and Larcker. The findings showed that the AVE value was higher than .5 which is indicative of an acceptable level of convergence validity for all scales used in the study (please refer to table 2). The "AVE" values shown in table 2 have been calculated using the formula below.

$$AVE = \frac{\Sigma \lambda_i^2}{\Sigma \lambda_i^2 + \Sigma_i \text{var}(\epsilon_i)}$$

The discriminant validity of the scales was analyzed through calculation of the square root of the average variance extracted. All calculations surpassed the factor correlations of each pair the various domains or subscales. The results therefore showed that all scales had adequate levels of convergent and discriminant validity (Please refer to table 2 for more details). Permission for the study was

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sought through the Institutional Ethics Review Board of the Lahore School of Professional Studies, University of Lahore. The ethical board did not find any risks for involving human participants. Moreover, when assessing the ethical dimensions, Declaration of Helsinki was complied with. After approval from the university, data collection was initiated using above instruments through various hospitals in Lahore, Pakistan. Being the Provincial Headquarter of the Province Punjab, the researchers were able to gain access to a large and diverse sample size. The participants were informed about the purpose of the research and were also informed about their rights to confidentiality and refusal to participate. SPSS 21.0 was used for data analysis. Pearson Correlation, Multiple Regression and chi-square analysis were used for data analysis. The calculations of the average variance extracted were done on SPSS and via MS Excel. Dummy coding had been used with reference groups to assess the predictive effects of gender, age, marital and socioeconomic status. Normality checks were performed prior to execution of the analyses. All assumptions for conducting these analysis had been met.

RESULTS

Table 1 shows the distribution of respondents, the majority of the sample falls with 52 participants (21%) in the 30-45 range, 148 (59%) in the age range of 46 to 60 years and 50(20%) in the 61-70 range. In terms of gender, the sample is split almost evenly between 130 males (52%) and 120 females (48%).In terms of education, 100 participants (40%) had matriculation level education, 98 (39%) having intermediate level and with 52 (21%) having graduate level education. In terms of family system, 123 (49%) belonged to joint family system and 127 (51%) belonged to nuclear systems. With regard to marital status, 21 individuals representing (8%) participants were single, 198 (79%) were married and 31 (12%) were widowed. In terms of socioeconomic status, 64 (26%) belonged to low income, 136 (54%) belonged to middle income and 50(20%) belonged to high income segments.

Table 1: Descriptive Statistics of Demographic Variables of the Sample

Variables	Frequency (%)
Age	
30-45	52(21)
46-60	148(59)
61-70	50(20)
Gender	
*Male	130(52)
Female	120(48)
Education	
Matriculation	100(40)
Intermediate	98(39)
Graduation	52(21)
Family System	
Joint	123(49)
Nuclear	127(51)
Marital Status.	
Single	21(8)
Married	198(79)
Widowed	31(12)
Socioeconomic Status	
Low	64(26)
Middle	136(54)
High	50(20)

Pearson Product Moment Correlation was conducted to assess the association among social support, internal locus of control, grit and depression (Table 2). The results showed that social support had a significant negative relationship with an external locus of control (r=-.33, p<.05), a significant positive association (r= .55, p<.01 with grit and with depression (r= -.61, p<.01). Moreover, internal locus of control was significantly and positively associated with grit (r= -.33, p<.01) but showed significant negative associations with depression (r= -.22, p<.01). The findings therefore showed that when the level of depression is high in cardiac patients, it is indicative of lower scores on internal locus of control. Moreover, lower levels of depression are associated with higher scores on internal locus of control. The table also depicts the AVE (average variance extracted) values which showed acceptable levels of convergent and discriminant validity.

Table 2: Inter-Correlation among Scores on Social Support, Locus of Control, Grit, and Depression

Variables	AVE	I	II	III	IV
Social Support	.71	___	.33*	.55**	-.61**
Internal Locus of Control	.68		___	.33**	-.22**
Grit	.65			___	-.31**
Depression	.73				__

Note: N=250, **p<.01, Domain correlations are shown above the diagonal. AVE=average variance extracted.

Table 3 revealed that there were strong associations between demographic variables, social support and grit with physical health status among cardiac patients. Male participants had significantly lower scores on depression (β = -.11, p<.05), stress (β = -.01, p<.05) and anxiety (β = -.03, p<.05) in comparison to their female counterparts. Moreover, those aged 30 to 45 had significantly lower scores on depression (β = -.08, p<.05), stress (β = -.08, p<.05) and anxiety (β = -.07, p<.05). Single participants had higher scores on depression (β = .18, p<.05), stress (β =.11, p<.05) stress and anxiety (β =.15, p<.05) stress. Additionally, low grit was connected to higher scores on depression (β =-.10, p<.05) stress, stress (β =-.01, p<.05) stress and anxiety (β =-.03, p<.05). An internal locus of control was associated with lower scores on depression (β =-.10, p<.05), stress (β =-.01,

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$p<.05$) and anxiety (β =-.03, $p<.05$). Finally, higher social support was correlated with lower scores on depression (β =-.15, $p<.05$), stress (β=-.09, $p<.05$) and anxiety (β=-.06, $p<.05$).

Table 3: Regression of Associations for Demographic Variables and Scores on Social Support and Grit with regard to Mental Health (Depression, Social Support and Anxiety)

		Depression			Stress			Anxiety		
Variables	**n (%)**	R^2	$^AR^2$	β [95 % CI]	R^2	$^AR^2$	β (95 % CI)	R^2	$^AR^2$	β (95 % CI)
Gender										
Male	130 (52)	.01	.01	-.11* [-.4.65, -1.91]	.00	.00	-.01* [-1.48, -.68]	.00	.00	-.03* [-1.32, -.41]
Female	120 (48)			Reference			Reference			Reference
Age (Years)										
30-45	52 (21)			-.08* [-1.72, -6.82]			-.08* [-1.16, -3.49]			-.07* [-1.15, -3.41]
46-60	148 (59)	.01	.01	.04 [-3.78, 7.75]	.01	.00	.06 [-1.33, 5.02]	.00	.00	.08 [-.73, 5.32]
61-70	50 (20)			Reference			Reference			Reference
Marital Status										
Single	21 (8)			.18* [6.08, .10]			.11* [6.92, .10]			.15* [2.44, .09]
Married	198 (79)	.00	.00	-.22 [-18.75, 2.24]	.00	.00	-.16 [-9.21, 2.33]	.00	.00	-.19 [-9.27, 1.70]
Widowed	52 (21)			Reference			Reference			Reference
Education										
Matriculation	100 (40)			.18* [3.28, .01]			.11* [2.92, .01]			.15* [2.44, .01]
Intermediate	98 (39)	.00	.00	-.02* [16.25, 1.21]	.00	.00	-.02* [8.21, 2.32]	.00	.00	-.19* [-6.27, 2.70]
Graduation	52 (21)			Reference			Reference			Reference
Grit										
Low	188(75)	.01	.01	-.10* [-.5.65, -1.91]	.00	.00	-.01 [-1.28, .68]	.00	.00	-.03* [-1.52, .43]
High	62 (25)			Reference			Reference			Reference
Locus of Control										
Low	98 (39)	.01	.01	-.10* [-.5.65, -1.91]	.00	.00	-.01* [-1.38, -.68]	.00	.00	-.03* [-1.62, -.45]
High	152 (61)			Reference			Reference			Reference

Table 4 assesses association of the determinants with depression in cardiac patients. The findings provided numerous insights about this association. The results showed that there were significant differences among cardiac patients in terms of their scores on grit, social support and locus of control. Specifically, cardiac patients having low grit (188 ± 1), low social support (136 ± 1) and an external locus of control (152 ± 2) were more likely to experience depressive symptomatology.

Table 4: Inter-Correlation among Scores on Social Support, Locus of Control, Grit, and Depression

Determinants		Frequency (%)	p-value
Grit	High	62(25)	0.01
	Low	188(75)	
Social Support	High	114(46)	0.01
	Low	136(54)	
Locus of Control	External	152(61)	0.01
	Internal	98(39)	

DISCUSSION

The purpose of the study was to assess the predictive role of grit, locus of control and social support on the mental health of cardiac patients. Another aim of the study was to assess how certain demographic factors along with social support and grit can provide protective effects against depression, stress and anxiety among cardiac patients. First, a significant negative association among grit, social support and mental health outcomes (depression, stress and anxiety) had been hypothesized. Consistent with the previous literature the present study showed that cardiac patients with limited social support and low scores on grit tend to report adverse mental health outcomes which were assessed through their scores on depression, stress and anxiety subscales (table 3) [33]. In addition, keeping in view the poor mental health outcomes of such patients, they stand at an enhanced risk of poor physical health outcomes including mortality. The relevant literature has shown that depression and anxiety are associated with increased mortality in cardiac patients [34]. A systematic review of 16 studies found that cardiac patients who experienced depression and anxiety had a higher risk of mortality compared to those who did not [35]. The risk of mortality was highest in patients with a history of depression or anxiety, suggesting that these factors can have a long-term effect on cardiac health [36]. Furthermore, a meta-analysis of 18 studies found that the risk of mortality was higher in patients with depression and anxiety compared to those without [37]. Secondly, significant mean differences with regard to age, gender, socioeconomic status, education and marital status were hypothesized with regard to mental health of cardiac patients. The results of

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the present study confirmed this hypothesis. Table 4 depicts that among cardiac patients, being a male in the age range of 30 to 45 years of age, being married, having higher levels of education, higher scores on grit with an internal locus of control is associated with improved mental health outcomes. It also shows the protective of the grit, social support and internal locus of control against depression, stress and anxiety. Sullivan et al. reported that males tend to have access to more opportunities for social support and thus tend to experience better mental health outcomes [38]. Similarly, Cho *et al.*, has reported that men with cardiac diseases tend to have better socioeconomic attainment in comparison to women which further allows them to cope with adverse mental health outcomes [39]. Jaffer *et al.*, reported that younger men have lower levels of depression, stress and anxiety with regard to cardiovascular conditions in comparison to older men [40]. Moreover, males diagnosed with cardiovascular conditions in general have a better mental health status in comparison to their female counter parts [41]. However, contrasting research evidence is also available to examine the effects of gender and socioeconomic status. One study reported that women belonging to lower socioeconomic strata were more likely to experience depression six months after a cardiac event than men, but there was no difference when examining longer-term outcomes [42]. Other research findings have shown that both sexes experience depression in similar proportions regardless of their socioeconomic statuses [43]. It was also hypothesized that higher scores on grit and social support would be associated with lower scores on depression thus indicating better mental health. Consistent with the previous literature, the results of the present study confirmed the above hypothesis. Research has shown that grit can help cardiac patients stay motivated and committed to their recovery goals [44]. It can help them maintain a positive attitude and stay focused on the end goal of a full recovery. Having a positive attitude can help cardiac patients have the confidence to push through tough times [45]. Moreover, social support can also be beneficial for cardiac patients. Having family and friends who are available to provide emotional support can be a great source of comfort for cardiac patients [46]. The presence of loved ones can reduce stress and anxiety levels and can help cardiac patients better cope with their diagnosis and treatment [47]. Additionally, friends and family can help remind cardiac patients of the importance of following their care plan, as well as providing emotional support during difficult times [48]. Moreover, it has been assessed that cardiac patients who have an external locus of control do not tend to take responsibility of their own health and wellbeing. The findings of the present study have further shown that having an external locus of control can lead to poor mental and physical health outcomes for cardiac patients. In this regard, the past literature has shown that patients who have an external locus of control are prone to experiencing depression and anxiety and are further expected to experience postoperative complications [49]. Moreover, as shown in the present study, the goal of providing different treatment and therapeutic interventions to cardiac patients should focus on enhancing their internal locus of control as it leads to improved physical and mental health outcomes as shown in the previous literature [4]. Though the study had sampled 250 cardiac patients, the fact that they were recruited through various hospitals of Lahore might raise concerns about the generalizability of findings. It is to be noted that individuals residing in big cities tend to have better access to inpatient and outpatient healthcare settings in comparison to those living in relatively rural settings.

CONCLUSIONS

In conclusion, it has been ascertained that having an internal locus of control, higher levels of social support and being gritty is associated with improved mental health outcomes in cardiac patients. The results of the present study have shown how enhancing social support, internal locus of control and grit can minimize poor mental health outcomes among cardiac patients. It has also been identified that cardiac patients belonging to upper age groups and lower socioeconomic strata may lack the resources necessary to access social support networks, such as the financial resources to attend support groups or the time and energy needed to initiate relationships. Thus, it is through enhancing support services and through providing psychological support interventions to these individuals that desirable mental health outcomes can be achieved.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

The Effectiveness of Different Doses or Types of Vitamin D Supplementation in HIV-Positive Individuals in Lahore

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ABSTRACT

The average lifespan of people suffering from HIV-AIDS is estimated to be 9 to 11 years, with Vitamin D deficiency as one of the most common phenomena among them. Anti-Retroviral Therapy (ART) could significantly enhance the quality of life of HIV-AIDS patients; however, it further decreases Vitamin D serum levels among them. **Objectives:** To evaluate the impact of vitamin D supplementation on immune function, viral load, and other health outcomes in HIV-positive individuals. **Methods**: This was a descriptive study conducted on a sample of 95 HIV-diagnosed patients aged 19 to 50 years in Punjab, Pakistan. Patients were selected from an AIDS control clinic and prescribed antiretroviral therapy. Baseline assessments were conducted using a structured evaluation questionnaire, and biochemical results were used to classify vitamin D deficiency. **Results**: The study presents information on PCR viral load counts in HIV patients, including minimum (50), and maximum (750,000) values, mean (32,475) with standard deviation (155,343), 5% sheared mean (28), and the 95% confidence interval (17,802 to 47,148) for the average. Results showed that HIV-positive patients taking vitamin D supplementation had a lower mean rank (50.07) compared to those not taking supplements (57.00), with a difference of 275.5 in the sum of ranks between the two groups. Inferential statistics suggested that vitamin D plays a significant role in improving the prognosis of HIV patients taking ART, with a significance value of 0.0032. **Conclusion**: The present study concludes that Vitamin D supplementation has a significant role in improving the life status of HIV patients.

INTRODUCTION

HIV is a retrovirus that defects the insusceptible framework cells and debilitates their capacities. HIV infection causes contamination that seriously harms the functioning of the human body framework, bringing about the lack and eventually loss of immunity and/ or resistance. Two different types of HIV are HIV-1 and HIV-2. HIV-1 is known to be more destructive and easily transmitted than HIV-2, which is less handily transmitted from one person to another and is likewise called the non-moderate form of HIV- implying the chances of the infection developing into AIDS is less. HIV-2 is, for the most part, bound to West Africa, whereas; the significant share of HIV-AIDS cases worldwide is attributed to HIV-1 [1]. With no medicine developed to cure HIV-AIDS, it has become an alarming public health concern worldwide. According to World Health Organization (WHO) estimates, around 80 million individuals worldwide have been infected with the virus since its outbreak, with almost 40 million causalities reported due to some reasons associated with HIV-AIDS (WHO, 2020). In addition, around 1.8 million people were reported to be newly infected in 2016. However, at the end of the year 2020, around 37.7 million people were living with HIV-AIDS, which 1.5 million were new infections, with more than 60 percent of the burden of the disease in the Africans

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[2]. HIV is transmitted from one individual to another through the exchange of bodily fluids; a more significant part of the HIV transmission is attributed to individuals involved in injecting drugs, homosexual habits, and male and female sex laboring. Likewise, the past examinations have shown a prevalence of HIV-AIDS in 27.2%, 5.2%, 1.6%, and 0.6% of the mentioned high-risk groups, respectively [3]. All HIV-positive patients in Pakistan are enrolled in the HIV-AIDS program where they get Anti-Retroviral Treatment (ART) to improve their quality of life. ART for HIV-AIDS has not just increased the prevalence rate of HIV patients by decreasing their mortality and hopelessness but also uncovered a few complexities connected with the treatment One of the typical complexities attached to ART is the absence of "vitamin –D" among the "HIV" infected individuals [4]. Evidence from the literature indicates that HIV infection and increased exposure to ART could add to modified degrees of "25-Hydroxy vitamin- D" [25(0H)-D] among HIV-positive patients. 25(0H)-D is one of the most commonly utilized parameters for assessing the Vitamin D serum levels among individuals and is considered a primary metabolites of Vitamin D [5]. The vast majority of current viewpoints describe the vitamin D level of 25(0H)-D <30 nmol/L (<12 ng/ml) as a lack of Vitamin D; the value of 30-50 nmol/L (12-20 ng/ml) as insufficient levels of Vitamin D while 25(0H)-D levels above 50 nmol/L as sufficient levels of Vitamin D serum. The prevalence of lack of vitamin D in HIV-infected people ranges from 60% to 90% and is directly associated with female gender [6, 7]. Lack of vitamin D is one of the most well-known anomalies among HIV-1 patients . Vitamin D is a chemical that has a pleiotropic effect on immune modulation for invulnerable tweak, notwithstanding its physiological role in mineral digestion [8]. A few examinations have revealed that vitamin D levels decline as HIV sickness advances and are connected to more regrettable endurance rates, emphasizing the significance of vitamin D supplementation all through infection [9]. However, when Vitamin D levels are expanded to typical values among HIV-infected patients, despite ART, irritation, markers related to bone turnover, and the risk of auxiliary hyperparathyroidism, the anti-bacterial response of the body increases while the counter bacterial reaction [10]. Besides various roles of Vitamin D, its principal function in the human body is to keep up with the capacity of monocytes and macrophages, which are connected to intrinsic human invulnerability to specific irresistible specialists. Evidence indicates that Vitamin D3 is one of the essential minerals for the human body because of its double capacity as an auxiliary steroid chemical that manages body calcium homeostasis [11]. A fundamental compound particle is known to affect immunological reactions significantly. Recent observational investigations have revealed higher susceptibility to different inflammatory and immune-mediated diseases among HIV-infected individuals when their Vitamin D levels fall beyond a certain level. The existing literature also emphasizes the metabolic and signaling mechanisms underlying Vitamin D3's complex immune regulatory effects on immune system [12]. The human body gets most of the 25(0H)-D through Ultraviolet-B (UVB) rays when the skin is exposed to sunlight, with a small sum of the vitamin from the food intake. Considering the notable impacts of Vitamin D on calcium and bone homeostasis, it is currently considered to be a mineral of extreme importance. Antigen-introducing T and B lymphocytes generally show the exact location of attachment of 25(0H)-D or these cells are primarily equipped for creating the physiologically dynamic vitamin D metabolite, 1, 25 di-hydroxy vitamin D. The staggering role of Vitamin D suggests that the absence and/ or lack of this nutrient should be avoided. In general, a higher prevalence of the lack of vitamin D (25(0H)-D levels of 50 nmol/L) has been accounted to the colder time of year when the skin does not sufficiently absorb UVB rays because of the lack of significant sunlight [13]. Therefore, to keep up the required levels of vitamin D, its supplementation is also needed. HIV infection is a primary medical issue that worsens personal satisfaction and is a significant reason for mortality among patients globally. In Pakistan, HIV prevalence is expanding rapidly while infusion drug clients, homosexuals, and sex laborers are high-risk crowds. Lack of vitamin D is typical among individuals living with HIV contamination. However, evidence indicates that vitamin D supplementation lessens the development of disease and enhances the quality of life of HIV-infected individuals [14]. HIV is a crucial challenge for public health. Inadequacy of 25(0H) has been average among individuals suffering from "HIV" contamination., as there could be no alternate method for treating HIV aside from utilizing ART (anti-retroviral therapy) in light of various gatherings. Lack of vitamin D is connected to bone and substantial issues, yet it likewise assumes a vital part in an assortment of viral and noninfectious illnesses. Infected individuals with the "HIV" infection may experience the ill effects of lacking vitamin D, as per a developing collection of proof.[2] Universally, 36.7 million individuals are contaminated with HIV. In Pakistan, 0.13 million people are impacted by "AIDS." Henceforth, it is urgent to manage a high portion of 25(0H) vitamin D replenishment in the HIV populace on ART since ART itself upsets and intrudes on the invulnerable modulatory instrument of 25hydroxy vitamin. There is no immediate arrangement of vitamin D with the suggested routine of ART in HIV patients who lack vitamin D [15]. There are limited studies on HIV disease staging along with ART and 25(0H)-D supplementation. To

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evaluate the effects of elevated amount 25(OH)-D replenishment in HIV individuals is difficult regarding illness prognosis on viral load count and PCR [16]. Similarly, there is a literature gap related to the role of highest value 25(OH)-D replenishment upon liver function outline of HIV participants on Anti-retroviral therapy. No 25(OH) guidelines are available regarding the deranged values of SGPT, SGOT, alkaline phosphatases, and serum bilirubin with 25(OH)-D deficiency in HIV patients on HIV medicine. However, the literature is directly available on 25(OH)-D supplementation with ART [17]. Evaluating the impact of vitamin D supplementation on immune function, viral load, and other health outcomes in HIV-positive individuals in Lahore is a crucial objective to determine the potential benefits and limitations of vitamin D supplementation in the management of HIV.

METHODS

The study was conducted on a sample of 95 HIV-diagnosed patients, aged between 19 to 50 years, who were selected from the AIDS control clinic in Punjab, Pakistan. The patients were prescribed antiretroviral therapy, and those who had taken vitamin D supplementation of > 100,000 IU in the last three months were excluded from the study. The study included Randomized-controlled design, where patients were dispensed with vitamin D taking or not along with antiretroviral therapy. Baseline assessments were conducted using a structured evaluation questionnaire, which collected information on various demographic characteristics and other attributes. Biochemical results were used to classify vitamin D deficiency, and statistical analysis was conducted using SPSS version 21.0. Descriptive statistics and chi-square tests were used to analyze the data.

RESULTS

Table 1 presents information on the PCR viral load counts in patients diagnosed with HIV, including minimum and maximum values, mean with standard deviation, 5% sheared mean, and the 95% confidence interval for the average. Viral load counts in 95 patients diagnosed with HIV using PCR. The PCR test detected viral loads ranging from 0 to 67567, with a minimum of 0 and a maximum of 67567. The average viral load for these patients was 10547.83 with a standard deviation of 15824.12. The 5% sheared mean, which is a measure of central tendency that reduces the impact of extreme values, was 8116.79. The 95% confidence interval for the average viral load was between 5901.69 and 15193.97. This means that we can be 95% confident that the true average viral load for all patients falls within this range. Overall, this information provides insight into the viral load counts in patients diagnosed with HIV and can be used to inform treatment decisions and monitor disease progression.

Table 1: Viral Load Counts in patients, (diagnosis for HIV)

PCR	Nin max values viral load. Mean ± SD	5% sheared Mean	95% C.I for Average
Detected (N=95)	10547.83±15824.12	8116.79	5901.69-15193.97

In Table 2, we compared the laboratory results of 39 HIV-positive patients taking vitamin D supplementation and 56 patients who were not taking supplementation to evaluate the prognosis of patients taking ART. The study aimed to investigate the potential differences in various laboratory parameters between individuals who take vitamin D supplements and those who do not. The study included 95 participants, with 39 taking vitamin D and 56 not taking it. For the participants who were taking Vitamin D supplements (N=44), the mean SGPT level was 39.38±35.84, which was higher than the mean SGPT level for those who were not taking Vitamin D supplements (N=76) which was 22.92±14.27. The mean SGOT level was also higher for the Vitamin D taking group (29.55±32.99) compared to the non-Vitamin D taking group (20.67±14.78). The mean total bilirubin level was similar for both groups (0.49±0.28 for Vitamin D taking and 0.39±0.37 for non-Vitamin D taking). The mean alkaline phosphatase level was higher for the Vitamin D taking group (252.45±99.87) compared to the non-Vitamin D taking group (143.19±58.42). The mean Hb level was slightly lower for the Vitamin D taking group (11.96±1.69) compared to the non-Vitamin D taking group (13.06±2.35), while the mean TLC level was lower for the Vitamin D taking group (6.23±1.72) compared to the non-Vitamin D taking group (8.83±3.30). The mean HCT level was similar for both groups (40.13±8.78 for Vitamin D taking and 37.79±7.93 for non-Vitamin D taking). The mean neutrophil (%) level was slightly lower for the Vitamin D taking group (45.13±11.73) compared to the non-Vitamin D taking group (47.29±11.21), while the mean lymphocyte count level was higher for the Vitamin D taking group (29.89±6.68) compared to the non-Vitamin D taking group (26.85±7.25). The mean eosinophil count was similar for both groups (2.00±1.161 for Vitamin D taking and 2.21±0.798 for non-Vitamin D taking), while the mean platelet count was slightly lower for the Vitamin D taking group (234.11±103.015) compared to the non-Vitamin D taking group (262.83±110.60). The mean and standard deviation (SD) values for each laboratory parameter were calculated separately for both groups. Additionally, the 5% sheared mean and p-value were reported for each parameter. The 5% sheared mean represents the average value of the parameter after excluding the top 5% and bottom 5% of the values, which helps reduce the influence of outliers on the analysis.

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Table 2: Comparison of laboratory variables in patients taking Vit D and patients not taking Vit D

Lab variables	N=95 Vit D taking=1 N=39 Vit D not taking=0 N=56	Mean ± SD	5% sheared mean	p-value
SGPT Level	1	39.38±35.84	34.94	0.00
	0	22.92±14.27	21.10	
SGOT Level	1	29.55±32.99	25.49	0.31
	0	20.67±14.78	18.68	
Total Bilirubin Level	1	0.49±0.28	0.49	0.00
	0	0.39±0.37	0.37	
Alkaline Phosphatase Level	1	252.45±99.87	242.30	0.00
	0	143.19±58.42	139.67	
Hb Levels	1	11.96±1.69	11.90	0.512
	0	13.06±2.35	13.07	
TLC Levels	1	6.23±1.72	6.24	0.281
	0	8.83±3.30	8.78	
HCT Levels	1	40.13±8.78	40.13	0.571
	0	37.79±7.93	37.69	
Neutrophil (%) Levels	1	45.13±11.73	45.83	0.589
	0	47.29±11.21	47.59	
Lymphocytes count Levels	1	29.89±6.68	30.02	0.00
	0	26.85±7.25	26.73	
Eosinophil Count	1	2.00 ±1.161	1.89	0.12
	0	2.21 ± 0.798	2.23	
Platelet Count	1	234.11 ±103.015	230.36	0.00
	0	262.83 ±110.60	264.61	

The Table 3 shows a comparison of viral load count levels in two subgroups of HIV patients, indicating that those taking vitamin D supplements had a slightly lower mean rank and potentially lower viral load count on average, but the difference in the sum of ranks between the two groups is not large. Based on the table, it appears that the subgroup of patients taking vitamin D supplements had a slightly lower mean rank (50.07) compared to the subgroup of patients not taking vitamin D supplements (57.00), suggesting that they had a lower viral load count on average. However, the difference in the sum of ranks between the two groups is not very large, with a difference of only 275.5 between the two subgroups.

Table 3: Comparison of viral load in vitamin D taking or not

Group Statistics of Viral Load Count Levels in HIV				
		N	Mean Rank	Sum of Ranks
Viral Load	Vit D not taking	56	57.00	2679.00
Viral Load	Vit-D taking	39	50.07	2403.50

Table 4 shows the results of inferential statistics that indicate the significant role of vitamin D in the better prognosis of HIV patients taking ART, with a significance value of 0.0032. Overall, these findings suggest that vitamin D supplementation may have an impact on certain laboratory parameters, particularly those related to liver function and blood cell counts. The results showed a statistically significant correlation between 25(OH)D levels and HIV prognosis, as indicated by the Pearson correlation coefficient value of 1.000 and a two-tailed p-value of 0.0032. A Pearson correlation coefficient of 1.000 indicates a perfect positive correlation between the two variables, suggesting that higher vitamin D levels are associated with better HIV prognosis.

Table 4: Inferential statistics to check the effectiveness of vit D in prognosis of HIV

Correlation al analysis for 25 (OH) D levels in HIV patients' prognosis				
Pearson correlational analysis	N=95	Correlation-Coefficient	df	Sig. (2-tailed)
		1.000	4.876	0.0032

DISCUSSION

Branch, explored the impact of vitamin D inadequacy on HIV-positive patients, particularly individuals of color. The study discussed the potential role of 25(OH)-D in HIV virus-related bone issues and its impact on CD4 cell count. The study also suggested that the effect of highly active antiretroviral therapy (HAART) on 25(OH) D levels and vitamin D's role in adipocyte separation may be significant in understanding changes in fat distribution and the development of insulin resistance. The potential differences in various laboratory parameters between individuals who take vitamin D supplements and those who do not. Similarly, our included 95 participants, with 39 taking vitamin D and 56 not taking it. The study found that vitamin D supplementation may have an impact on certain

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laboratory parameters, particularly those related to liver function and blood cell counts. However, the study design is not randomized or controlled, and therefore, these findings should be interpreted with caution and further research is needed to confirm these results [18]. Brehm, evaluated the efficacy of DRV/r mono-treatment compared to triple treatment in HIV patients. The study found that changing to DRV/r mono-treatment resulted in a significant improvement in patients with HIV RNA over 50 copies/ml. The proportion of patients with HIV RNA over 50 copies/mL was 69% in the DRV/r mono-treatment arm and 75% in the triple treatment arm. The study included 21 and 13 patients in the DRV/r mono-treatment and triple treatment arms, respectively, who had two consecutive HIV RNA readings over 50 copies/ml. At week 144, 86% and 77% of patients in the DRV/r mono-treatment and triple treatment arms, respectively, had two consecutive HIV RNA readings . While our aimed to investigate the potential differences in lab parameters. In conclusion, both studies provide important findings related to their respective research questions, but they cannot be directly compared due to their different objectives and designs [19]. Hollis *et al.*, *in* a randomized control analysis, explored the impact of the week-after-week vitamin D supplementation on newborn child mortality, grimness, and development in term babies with a low birth weight up to the age of 6 months. Around 2079 "low birth weight infants brought into the world at term: >37 weeks' incubation" were enlisted from a massive government-run emergency clinic in New Delhi determined to decide the actual result of clinic affirmations and passing in the initial half-year of life, with development as an auxiliary result. Consistently, they have stepped in with vitamin D shots. Similarly in our study the results showed significant differences between the two groups for several parameters. Participants taking vitamin D had significantly higher levels of SGPT, total bilirubin, alkaline phosphatase, lymphocyte count, and lower platelet count compared to those who did not take it. On the other hand, there were no significant differences between the two groups in terms of SGOT, Hb, TLC, HCT, neutrophil percentage, and eosinophil [20]. However, in our study correlation did not imply causation, and further research was needed to establish a causal relationship between vitamin D levels and HIV prognosis. Additionally, the study design was clear, and there may be confounding variables that could influence the results. Therefore, these findings should be interpreted with caution, and additional research is needed to confirm these results.

CONCLUSIONS

The present study concludes that Vitamin D supplementation has a significant role in improving the life status of HIV patients. Therefore, regular Vitamin D supplementation as a part of routine medication for HIV-infected individuals with ART is highly recommended. Further research explicitly highlighting the supplementation of vitamin-D dosage with traditional HIV medication is needed to improve the patient prognosis to disease and reduce patients' disease-related complications over their entire life span.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Radiofrequency Catheter Ablation of Mahaim Tachycardia in Adult Patients

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ABSTRACT

Mahaim pathways causing reentrant tachycardia are rare but potentially dangerous arrhythmia. Catheter ablation is the definitive treatment option for individuals with this kind of tachycardia. **Objective:** To evaluate the efficacy and safety of radiofrequency catheter ablation of mahaim tachycardia in adult patients. **Methods:** A retrospective study investigated total of 40 adult patients referred to the Cardiac Electrophysiology Department of Hayatabad medical Complex Peshawar from 4th January 2017 to 21st September 2022 were enrolled. Patient's age (20-68 years) of both male and female genders referred for radiofrequency ablation of mahaim tachycardia were studied. The tachycardia was invariably antidromic, resulting from anterograde conduction via the Mahaim pathway. All the cases were followed for complications. **Results:** The overall mean age was 43.60 ± 12.4 years. The mean ablation and flouro time was 9.44± 6.93 minutes and 20.64 ± 9.77 minutes respectively. Hypertension and diabetes were found in 11 (27.5%) and 6 (15%) patients respectively. The successful ablation was achieved in 31 (77.5%) patients whereas 1 case was abandoned. During follow-up, one patient developed femoral hematoma as a complication. Typical Atrioventricular nodal reentry tachycardia (AVNRT) and atrial fibrillation were other tachycardia found in 3 (7.5%) and 4 (10%) respectively. The incidence of congenital anomalies such as ASD Secundum, HOCM, DCM, and Ebstein Anomaly was 2 (5%), 1 (2.5%), 1 (2.5%), and 1 (2.5%) respectively. **Conclusion:** The present study found that Radiofrequency ablation is effective and safe for treating Mahaim tachycardia. The success rate of RFA was 77.5%.

INTRODUCTION

Catheter ablation is becoming a more prevalent treatment option for individuals with tachycardia. The radiofrequency energy introduction for catheter ablation transformed the reentrant tachycardias patients arbitrated by auxiliary circuits. Majority of population now consider radiofrequency ablation the best suitable treatment for symptomatic tachycardia. The restricted variation as Mahaim tachycardia is not clear since Mahaim fibers have electrical features that make traditional mapping and ablation approaches ineffective. Mahaim described abnormal conduction pathways linking the atrioventricular node or His-Purkinje system to the ventricle over 50 years ago [1, 2]. Subsequent research shown that these fibers possessed unique features, such as exclusive anterograde and decremental conduction, and that they could be identified far from the atrioventricular node and removed using surgery or catheter ablation [3-6]. Most of these routes have recently been categorized as atriofascicular fibers with decremental features that connect the right atrium to distal sections of the right branch of the His bundle [7, 8]. Mahaims tachycardia is a reentrant atrioventricular tachycardia induced by the right accessory pathway with attenuated antegrade conduction that acts as the anterograde terminal in retrograde atrioventricular tachycardia [9, 10]. These additional pathways may enter the ventricular myocardium through the distal right leg or directly into the ventricular myocardium at the tricuspid annulus. Catheter ablation is becoming a more prevalent treatment option for children with supraventricular arrhythmias. The success rate was 90-98%, while significant problems like as atrioventricular (AV) block occur in 0.7-2.65% of young ablated patients [11].

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Additionally, no substantial indication of reversing conduction has been found in Mahaim pathways. Therefore, the present study aimed to evaluate the efficacy and safety of Mahaim tachycardia radiofrequency catheter ablation in adult patients.

METHODS

After approval from the hospital ethical committee, the retrospective study was conducted in the Department of Cardiac Electrophysiology Hayatabad Medical Complex Peshawar from 4th January 2017 to 21st September 2022. A total of 40 patients were enrolled. Consecutive sampling technique was used for data collection. Patient's age (20-68 years) of either gender referred for radiofrequency ablation of Mahaim tachycardia were enrolled. The sample size of 40 was calculated based on 95% confidence interval, 5% margin of error, and complication rate 2.65% [11]. Patients (<20 years or >68 years) with no signs and symptoms of tachycardia were excluded. All the patients experienced symptoms and either had tachycardia or produced during an electrophysiological examination. The tachycardia was invariably antidromic, resulting from anterograde conduction via the Mahaim pathway. All the cases were followed for complications. Following providing informed written consent, all patients received electrophysiological study and ablation. Prior to intervention, all antiarrhythmic medications had been discontinued. Diazepam and diamorphine were used to sedate the patients. After confirmation of Mahaim tachycardia, a large-tip deflectable electrode catheter with a 4 mm distal electrode was inserted into the femoral vein to map the tricuspid annulus. Target ablation sites were chosen based on the existence of distinct Mahaim potentials, which mimicked signals obtained from the His bundle electrode but at different locations. Moreover, atrial pacing and Mahaim tachycardia might disassociate such potentials from the His bundle electrogram. Radiofrequency radiation was carried for up to three and a half minutes, but if no impact was noticed after 15 seconds, the supply was halted. For statistical analyses, Stata 15.1 was utilized. Data were displayed as percentages (%) or as the median (range or quartiles). The 2-test or Mann-Whitney test was used to compare groups. P<0.05 was found to be significant.

RESULTS

Age-wise distribution of patients were as follows: 8 (20%) in 20-32 years, 13 (32.5%) in 33-44 years, 12 (30%) in 45-56 years, and 7 (17.5%) 57-68 years. Age-wise distribution of patients are shown in Table 1.

Table 1: Age-wise distribution of patients

Age groups (years)	Frequency (%)
20-32	8 (20)
33-44	13 (32.5)
45-56	12 (30)
57-68	7 (17.5)

The overall mean age was 43.60 ± 12.483 years with an age range 20-68 years. Of the total 40 patients, there were 28 (70%) male and 12 (30%) females. The mean ablation and flouro time was 9.44 ± 6.93 minutes and 20.64 ± 9.77 minutes respectively. Hypertension and diabetes were found in 11 (27.5%) and 6 (15%) patients respectively. The successful ablation was achieved in 31 (77.5%) patients whereas 1 case was abandoned. During follow-up, 1 patient developed femoral haematoma as a complication. Typical Atrioventricular nodal reentry tachycardia (AVNRT) and atrial fibrillation were other tachycardia found in 3 (7.5%) and 4 (10%) respectively. Baseline characteristics of patients are shown in Table 2.

Table 2: Baseline characteristics of patients

Variables	Value (Mean ± SD)
Age (years)	43.60 ± 12.483
Ablation time (minutes)	9.44 ± 6.93
Flouro time (minutes)	20.64 ± 9.77
HTN	11(27.5)
DM	6(15)
Success	31 (77.5)
Failure	8 (20)
Abandon	1 (2.5)
Others tachycardia	
AVNRT	3 (7.5)
A fib	4 (10)
No	33 (82.5)

The incidence of congenital anomalies such as ASD Secundum, HOCM, DCM, and Ebstein Anomaly was 2 (5%), 1 (2.5%), 1 (2.5%), and 1 (2.5%) respectively. Non irrigated APT, irrigated cool flow, and non-irrigated Therapy were the different catheters used in 37 (92.5%), 1 (2.5%), and 2 (5%) respectively. Tachycardia was induced after ablation in 10 (25%) patients. Details of congenital anomalies, catheter, and ablation in tachycardia, are shown in Table 3.

Table 3: Details of congenital anomalies, catheter, and ablation in tachycardia

Variables	Value (Mean ± SD)
Congenital anomalies	
ASD Secundum	2(5)
HOCM	1(2.5)
DCM	1(2.5)
Ebstein Anomaly	1(2.5)
Catheters	
Non irrigated APT (4mm)	37(92.5)
Irrigated cool flow (4mm)	1(2.5)
Non irrigated Therapy (4mm)	2(5)
Ablation in tachycardia	
Yes	10(25)
No	30(75)

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DISCUSSION

The present study mainly focused on the radiofrequency catheter ablation of Mahaim tachycardia in adult patients and found that Radiofrequency radiation is effective and safe for treating Mahaim tachycardia (an uncommon but potentially dangerous arrhythmia) by targeting Mahaim potentials. Other prevalent arrhythmia substrates necessitate a gradual reasonable method to identify and treat the perpetrator arrhythmia. The Mahaim pathways can be blocked by mechanical induction rather than other accessory atrioventricular pathways. Radiofrequency ablation is effective and safe for treating Mahaim tachycardia. Additional auxiliary pathways appear to be frequent in Mahaim tachycardia patients. Hypertension and diabetes were the most prevalent conditions. The success rate of treatment was 77.5%. The detection of Mahaim potentials reveals the majority of pathways, allowing for effective ablation and the elimination of accompanying tachycardia. Another successive study indicated that a highly effective method for treating tachycardia is radiofrequency ablation [12]. In line with earlier data demonstrating that Mahaim tachycardia treatment with surgical procedure or catheter-based procedures, no individual had the substrate described by Mahaim.' Moreover, de Alencar *et al.*, reported the atrioventricular fibres may represent the foundation for Mahaim tachycardia; these auxiliary bundles showed the histological hallmarks of atrioventricular nodal tissue [13]. Lee *et al.*, reported that Mahaim tachycardia treated with effective catheter ablation by direct current of high intensity aimed at the atriofascicular pathway distal insertion [14]. Another short series reported that two patients had persistent right bundle branch block [15]. Additionally, the ablation of right bundle branch of distal can be performed without harming the atriofascicular fibre. This can cause a prolonged tachycardia cycle length and perhaps persistent tachycardia [16]. Target ablation has been identified in the majority of our patients based on Mahaim tachycardia except in direct atrioventricular connection condition. Conduction in both regular and auxiliary channels can be stopped by applying pressure to the mapping electrode of catheter. During electrophysiological research, transient right bundle branch block is fairly rare; nevertheless, traumatic block is significantly more prevalent in Mahaim pathways than in conventional accessory atrioventricular connection. Silva *et al.*, and Soares *et al.*, reported that "successful ablation of an atriofascicular fibre by radiofrequency energy application on the ventricular side of the tricuspid annulus at a place where catheter tip pressure produced serendipitous elimination of pre-excitation" [17, 18]. Moreover, it has also been proposed that catheter-induced mechanical block is the ideal marker for guiding radiofrequency energy administration at the tricuspid annulus in Mahaim pathways [13]. Osman *et al.*, shown that high-energy shocks in the right ventricular apex at a position proximal to the fiber's implantation in the right ventricle or in the right bundle-branch may be used to ablate the right atriofascicular fibres while retaining the conduction system [19]. Nevertheless, owing of the increased duration of ventriculoatrial conduction, this might have proarrhythmic consequences, making tachycardia crises more common [20, 21].

CONCLUSIONS

The present study found that Radiofrequency ablation is effective and safe for treating Mahaim tachycardia. Additional auxiliary pathways appear to be frequent in patients with this kind of tachycardia . The success rate of RFA was 77.5%. The detection of Mahaim potentials reveals the majority of pathways, allowing for effective ablation and the elimination of this tachycardia.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Frequency of Macrosomia in Neonates Among Women with Gestational Diabetes Mellitus

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ABSTRACT

One of the most frequent pregnancy complications is gestational diabetes mellitus (GDM), which raises the risk of unfavorable health issues for both mother and fetus. Macrosomia and increased fetal growth are significant contributors to poor perinatal outcomes. **Objective:** To determine the frequency of macrosomia in neonates among women with gestational diabetes mellitus. **Methods:** This Descriptive study was done in Department of Obstetrics and Gynecology, Dow University Health Sciences Karachi from 3rd April 2018 to 2nd october 2018.We enrolled 100 patients meeting the criteria. Informed consent was taken. **Results:** The average age of the patients was 31.16 ± 4.37years, mean gestational age 38.51 ± 2.7 weeks while Mean BMI of the patients was 28.74 ± 1. 3. Frequency of macrosomia in neonates among women with gestational diabetes mellitus was observed in 14%. **Conclusions:** It is concluded that there was a significant number of macrosomia associated with women having gestational diabetes. So, it needs prompt diagnosis and expert management to decrease maternal and fetal morbidity and mortality.

INTRODUCTION

One of the most frequent pregnancy complications is gestational diabetes mellitus (GDM), which raises the risk of unfavorable health issues for both moms and fetuses. Glucose intolerance with onset or first identified in pregnancy" is the definition of gestational diabetes mellitus. Macrosomia and increased fetal growth are significant contributors to poor perinatal outcomes. One major consequence of diabetic pregnancies is macrosomia and can affect up to 30% of the child. Genetics, gestational diabetes, a long gestation, a high pre-pregnancy body mass index, significant gestational weight gain and diabetes mellitus are all risk factors for fetal macrosomia. Risk factors for macrosomia include genetic, sex, racial, and ethnic variables. Male newborns often weigh more than female newborns, and as a result, they make up a larger percentage of babies with birth weights over 4500 gm. The risk of macrosomia also varies by ethnicity, with Hispanic women having a higher risk than white, African American, or Asian women for fetal macrosomia. Newborn birth weight is also influenced by genetic variables including parental height and weight [1]. Cord blood lipid concentration is influenced by maternal lipid and lipoprotein levels. Increased BMI and GDM are also linked to harmful metabolic adaptations, which increase

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the risk of preeclampsia, macrosomia, stillbirth, miscarriage, and macrosomia [Furthermore, placental abnormalities brought on by impaired trophoblast invasion and blood vessel development are present with increased lipid transport in GDM [2]. These people may be predisposed to obesity later in life due to excessive fetal fat deposition, which also raises the chance of an obesity cycle Evidence suggests that atherosclerosis may start at birth, hence measuring the serum lipid levels in cord blood may be crucial. Just the newborn's weight has been employed as a measure of fetal growth in studies comparing the relationship between maternal size and nutrition with neonatal size. Maternal lipids play a significant role in fetal lipids and fetal growth in GDM pregnancies that are well-controlled. Compared to babies with normal growth, those with aberrant growth are likely to experience a distinct intrauterine environment. Preexisting DM and change in maternal glucose regulation are the major contributing factors for gestational diabetes mellitus [3]. The incidence of DM is increasing in women of childbearing age in the United States and accounts for about 7% of the population while a big number id still undiagnosed [4]. According to a study by Stuebe *et al.*, apart from other clinical risk factors, gestational diabetes mellitus results in alteration of metabolic function that even continues three years of postpartum period [5]. The purpose of our study was to determine the frequency of macrosomia in neonates among women with gestational diabetes mellitus.

METHODS

This Cross-Sectional study was done in Department of Obstetrics and Gynecology, Unit-II ward-9, Jinnah Postgraduate Medical Centre, Karachi from 3rd April 2018 to 2nd October 2018. By using WHO calculator with confidence level of 95% with error of margin 7% and anticipated Population around 15% sample size is 100. We enrolled patients 100 patients by using non-probability, consecutive sampling of age of patients 20 to 40 years, and diagnosed cases of gestational diabetes in index pregnancy, gestational age more than 37 weeks as calculated by earlier scan. Singleton gestation diagnosed on ultrasound scan. We excluded Women with diagnosed case of type 1 or type 2 diabetes mellitus (checked from medical record) Congenital abnormalities in baby diagnosed on ultrasound, co-morbid affecting birth weight like Pregnancy induced hypertension, chronic hypertension and SLE assessed on history. After approval from ethical committee of hospital, all 100 patients admitted in the labor room who fulfill the inclusion criteria was enrolled after taking their consent. Detailed history and record were reviewed. Gestational age was calculated from LMP and was confirmed by available earlier scan. Gestational diabetes was labelled after OGTT (oral glucose tolerance test) that defines glucose value of > 153 mg/dL after 2-hour of taking 75-gram oral glucose and macrosomia labelled when fetal birth weight more than 3500 gm. The collected data were analyzed by using SPSS version 22.0. Mean was computed for quantitative variables like age, BMI, gestational age, birth weight. Frequency and percentage were calculated for gender of neonate, gravida and macrosomia. Effect modifier like maternal age, gravida, gestational age and BMI was adjusted through stratification. Chi square test was applied and p-value less than or equal to 0.05 was taken as significant.

RESULTS

A total of 100 women with diagnosed cases of gestational diabetes in index pregnancy were included in this study. Age ranges from 20-40 years with average age of the patients was 30.31 ± 3.5 years, whereas majority lies between 26 to 35 years. Gestational age varies from 37 to 40 weeks with average of 38.51 ± 2.7 weeks while Mean BMI of the patients was 28.74 ± 1.3. The average weight of the neonate was 3.9 ± 4.52 kg as shown in table 1.

Table 1: Descriptive Statistics of Demographic Characteristics

Variables	Range	Mean ± SD
Age (Years)	20-40	30.31 ± 3.5
Gestational Age (Weeks)	37-40	38.51 ± 2.7
BMI (kg/m^2)	27.95-29.54	28.74 ± 1.3
Baby Weight (kg)	3.3-4.8	3.9 ± 4.52

Out of 100 male neonates were 64(64%) and 36(36%) were female neonates. 55(55%) women had history of multigravida while 45(45%) women were primigravida. Frequency of macrosomia in neonates among woman with gestational diabetes mellitus was observed in 14% as shown as shown in table 2.

Table 2: Descriptive Statistics of variables

Variables	Frequency (%)
Gravida	
Primi-gravida	45(45)
Multigravida	55(55)
Gender	
Male baby	64(64)
Female baby	36(36)
Macrosomia	14(14)

Stratification for macrosomia was done with respect to effect modifiers like maternal age, gestational age and BMI, using chi-square test at level of significant 0.05 as shown in table 3.

Table 3: Stratification of macrosomia with variables n=100

Variables	Macrosomia		Total	p-value
	Yes	No		
Maternal Age				
20 -30	9 (16.9)	44(83.01)	53	0.67
30-40	5 (10.63)	42(89.36)	47	

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Gestational Age				
<39	10(20.83)	38(79.16)	48	0.59
>39	4 (7.6)	48(92.3)	52	
Parity				
1	6(14.63)	35(85.36)	41	0.65
>1	8 (13.5)	51(86.4)	59	

DISCUSSION

Gestational diabetes mellitus (GDM) is a state of altered glucose metabolism that develops during pregnancy. Its severity and progression might vary. Traditionally, it has been linked to an increase in long-term issues for both the mother and her children, as well as an increase in prenatal morbidity and mortality. As comparison to macrocosmic newborns of nondiabetic moms, diabetic babies with macrosomia had more total body fat, thicker upper-extremity skin fold measurements, and smaller ratios of head to stomach circumference [6]. The placenta, amniotic fluid, gravid uterus, and the fetus account for half of the weight gained during pregnancy. Increased maternal storage of cellular water, fat, and protein is linked to the rest. Maternal fat deposition is responsible for additional weight gain. Preterm birth, caesarean section, gestational diabetes, hypertensive diseases, and infant mortality are all increased risks with higher weight gain during pregnancy. These effects would support early diagnosis and effective treatment. It is a public health issue that now has an impact on a sizable portion of the female population and has both immediate and long-term effects on the mother and the unborn child. GDM complicates more than 200,000 pregnancies worldwide every year, with a prevalence that can range from 1% to 14% of all pregnancies, depending on the population being investigated [7]. Our study comprised 100 women with gestational diabetes that had been detected during the index pregnancy and goal was to determine the frequency of macrosomia in newborns in these women. The majority patients were of age 20 to 35 years with mean age was 30.31 ± 3.5 years while this was consistent with age range of study by Jawad *et al.*, who found majority lies between 25 to 30 years of age while Bener *et al.*, observed the higher age group ranging from 35 to 45 year were most affected [8, 9]. In this study frequency of macrosomia was 14% while similar figure was also observed by Chauhan *et al.*, who reported 15%. Study by Alam *et al.*, reported very high number who enrolled 40 infants of diabetic mothers & found that macrosomia occurred in 18 babies (45%) it may because of poor controlled of diabetes and sample selection [10, 11]. It is observed in many studies that maternal hyperglycemia affectively results in to fetal hyperglycemia leads fetal hyperinsulinemia and decrease in fetal insulin reserve and insulin resistance and this proves to be main pathophysiology of underlying increase in total body weight [12,13]. Studies also shown that macrosomia neonates are more prone to develop fetal morbidity and mortality like shoulder dystocia, plexus injuries and still birth and more NICU admissions for macrocosmic neonates compared with newborns with a normal birth weight [14,15]. In our study macrosomia is more associated with younger maternal age 9(64.2%) out of 14 with age group 20-30 years and higher gestational age 10(71.42) out of 14 with gestational age >39 weeks with in insignificant p-value, this observation is in agreement with study by Okun *et al.*, and Stotland *et al.*, they also found positive association of macrosomia with younger maternal age and higher gestational age [16, 17]. Higher gestational age may be result in more weight gain. Macrosomia was more with women having history of multiparty 8(57.1%) out of 14 with a non-significant p value, while this was also in agreement with the finding of Gibson *et al.*, [18]. In comparison to a baby of normal weight, macrosomia is linked to a higher incidence of caesarean deliveries and birth canal injuries during vaginal deliveries [19]. Fetal macrosomia is more frequently associated with abnormalities of labor protraction and arrest. The majority of macrosomia-related caesarean deliveries are the result of atypical labor. Third- or fourth-degree lacerations, postpartum hemorrhage, and chorioamnionitis are all also more likely to occur with delivery of macrosomia baby [20]. There is certain limitation of our study like this study in at one hospital and we have seen frequency of macrosomia in only women having gestational diabetes, more studies are required to identify more risk factors for the macrosomia.

CONCLUSIONS

This study shows that there was a significant number of macrosomia neonates associated with women having gestational diabetes and various risk factors showing more trend in development of babies with high birth weight. As it needs early diagnosis so we suggest more studies to know more accurate number of cases so that an expert management can be done to reduce maternal and fetal morbidity and mortality.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Evaluation of Mean Platelet Volume in Patients of Recurrent Aphthous Stomatitis

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ABSTRACT

One of the most prevalent conditions affecting the oral mucosa is recurrent aphthous stomatitis (RAS), which is characterized by uncomfortable ulcerations on the movable or non-keratinized oral mucosa. **Objective:** To compare mean platelet volume (MPV) in patients of recurrent aphthous stomatitis (RAS) versus healthy control. **Methods:** This non-probability sampling case-control research included 56 RAS patients and 56 healthy controls. Patients who presented for dental treatment and have RAS in oral cavity were included. Patients with systemic inflammatory illnesses, autoimmune diseases like pemphigus, or infectious diseases like herpes who attended for dental treatment and exhibited RAS in the oral cavity were excluded. The healthy control group had no mouth ulcers or blood problems. A Student t-test compared MPV between cases and controls based on age, gender, and MPV. **Results:** The mean age of the participants was 29.35 ± 8.28 years, with 57 (50.89%) females and 55 (49.11%) males. The mean MPV in the RAS group (8.86 ± 0.33) was significantly higher ($p < 0.001$) than in the control group (6.95 ± 0.2). The univariable model coefficient of 1.91 (95% CI = 1.81-2.01, $p < 0.001$) indicates that the RAS group had a significantly higher MPV than the Control group. For gender, males had a lower MPV compared to females ($\beta = -0.36$), but it was not statistically significant ($p = 0.056$). **Conclusions:** RAS patients have higher platelet activity indicated by higher mean platelet volume (MPV) than healthy controls.

INTRODUCTION

Recurrent aphthous stomatitis are ulcers of inflammatory origin which have a distinct clinical picture of a well demarcated ulcer with an erythematous halo [1-3]. It is caused by multiple factors which are still under research. Although a definitive etiology does not exist, several factors are suspected as possible causes for RAS [4]. These include trauma, genetic background, hematological disorders, immunological factors, smoking cessation (cigarettes), stress, microbial factors, nutritional factors (such as folate and B-complex vitamin deficiencies), and allergies [5-7]. Among them stress and nutritional deficiency play a major role in initiating the inflammatory state of the body [8, 9]. Inflammation can be quantified by measuring marker of inflammation [10]. Platelets play a crucial role in coordinating inflammation by interacting with neutrophils a, monocytes, endothelium and lymphocytes [11]. Mean platelet Volume in Complete Blood Count gives information of the size of the platelets and their function. We can utilize this value as an indicator of inflammation [12]. The use of inflammatory markers can aid in the diagnosis of recurrent aphthous ulcer by establishing the inflammatory nature of the presented

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ulcer. Among the various markers available, complete blood count (CBC) has been found to be the most cost-effective option. In addition, CBC results are easily obtainable within hours, making it convenient for researchers to track and record reports. Therefore, CBC can be a useful tool in aiding clinicians to diagnose recurrent aphthous ulcer [13]. International research conducted by Sereflican *et al.*, showed significant difference in the value of MPV in patients of recurrent aphthous stomatitis as compared to control group [14]. In another study by Biyik et *al.*, they found no statistical difference in values of MPV in control group and patients of RAS [15]. This could be attributed to retrospective nature of study and improper screening of controls. In a study by Karaer *et al.*, showed a Mean platelet volume (fL) in patients with RAS of 9.8 ± 0.17 as compared to controls 10 ± 0.19 (p=.35) [16]. A positive correlation between recurrent aphthous ulcers and an increased MPV value can guide clinicians in diagnosing inflammatory ulcers. This information can help clinicians determine if the ulcer is of inflammatory origin, which can aid in patient counseling and provide reassurance that the disease. The objective of this study was to compare mean platelet volume in patients of recurrent aphthous stomatitis versus healthy control

METHODS

This case-control study was conducted at the Dental OPD of Sharif Medical and Dental College/Affiliated Hospital, Karachi from 1st July, 2022 to 28th February, 2023 on 58 participants using non-probability consecutive sampling. The sample size was calculated using WHO calculator to estimate a mean at a confidence level of 95% and an acceptable difference of 0.05, assuming a mean of MPV in RAS patients of 10 ± 0.19 (from the study by Karaer *et al.*,) [16]. The required sample size was 56 (55 RAS and 56 controls). Ethical approval was obtained from the hospital and verbal informed consent was obtained from all participants. The inclusion criteria were patients who presented to the Dental OPD for dental treatment and had RAS in the oral cavity. Patients with underlying systemic inflammatory conditions who presented with complaints other than RAS, autoimmune diseases such as pemphigus, or infectious diseases such as herpes were excluded from the study. The cases were patients who had recurrent aphthous stomatitis (RAS), while the controls were healthy subjects who did not have any oral ulcers or blood disorders. RAS was diagnosed by physical examination as the presence of one or multiple round-to-ovoid, shallow, punched-out-appearing, painful oral ulcers. The normal range for mean Platelet Volume is 8.9-11.8 fL. Demographic data like age, gender and contact details were recorded. Performa was filled of patients fulfilling the inclusion criteria. Blood samples were collected from each participant (both case and control groups) using a sterile needle and syringe or a vacutainer system. Appropriate safety precautions were used and standard phlebotomy protocols were followed. The blood sample was transferred to an EDTA tube and inverted several times to ensure proper mixing of the anticoagulant. The sample was processed within 2 hours of collection to prevent platelet activation and degranulation. The MPV was measured using an automated hematology analyzer, and the manufacturer's instructions for operating the analyzer were followed to ensure that it was calibrated properly. MPV was reported in femtoliters (fL). Our hypothesis was that value of Mean Platelet Volume will be increased in patients presenting with Recurrent Aphthous Ulcers. The data were entered and analyzed using R programming version-4.1.2. Descriptive statistics were computed for all variables. An independent samples t-test was performed to compare MPV values between cases and controls. Linear regression was run to control for confounding variables, using MPV as the dependent variable and comparators (case and control), age, and gender as independent variables. A significance level of p <0.05 was used to determine statistical significance.

RESULTS

The mean age of the participants was 29.35 ± 8.28 years. There was a total of 112 participants in the study, with 57 (50.89%) being female and 55 (49.11%) being male. In terms of age group, the majority of participants were in the 26-40 age group, with 63 (56.25%) participants falling into this category. 42 (37.50%) participants were in the 13-25 age group, and only 7 (6.25%) were in the 41-65 age group (Table 1).

Table 1: Distribution of gender and age group

Variables	Characteristic	n (%)
Gender	Female	57 (50.89)
	Male	55 (49.11)
Age group (years)	13-25	42 (37.50)
	26-40	63 (56.25)
	41-65	7 (6.25)

The mean age of RAS (25.75 ± 4.36) was lower than controls (32.95 ± 9.64) statistically (p<0.001). The females were more in RAS (60.71%) than control group (41.07%) and the difference was statistically significant (Table 2).

Table 2: Comparison of age and gender between case and control

Characteristic	Aphthous, N = 56	Control, N = 56	p-value
Age (yrs), Mean ± SD	25.75 ± 4.36	32.95 ± 9.64	<0.001*
Gender, n (%)			
Female	34 (60.71)	23 (41.07)	0.038**
Male	22 (39.29)	33 (58.93)	

*Student t-test, **chi-square test

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The mean MPV for the Control group is 6.95 ± 0.20 (mean ± standard deviation), while for the RAS group, it is 8.86 ± 0.33. The p-value for the comparison of MPV between the two groups is <0.001, indicating that the difference between the means of the two groups is statistically significant (Table 3).

Table 3: Comparison of mean platelet volume between cases and control

Characteristic	Control, n = 56	RAS, n = 56	p-value
MPV, Mean ± SD	6.95 ± 0.20	8.86 ± 0.33	<0.001

*Welch Two Samples t-test

The univariable model coefficient of 1.91 (95% =1.81-2.01, p<0.001) indicates that the RAS group has a significantly higher MPV than the Control group. The multivariable model coefficient of 1.97 (95% =1.85-2.09, p<0.001) indicates that even after adjusting for other variables, the RAS group still has a significantly higher MPV than the Control group. For gender, the negative coefficient (-0.36) indicates that on average, males have a lower MPV compared to females, but difference is not statistically significant (p=0.056). The coefficient for the multivariable analysis indicates the change in the MPV for males compared to females after controlling for age group, but it is also not statistically significant. The coefficients for the univariable analyses show the difference in MPV between the reference group (13-25) and the other age groups. The negative coefficients for 26-40 and 41-65 indicate that on average, these age groups have lower MPV compared to the reference group. Both coefficients are statistically significant, with p-values less than 0.001. The coefficients for the multivariable analyses show the change in the MPV for each age group after controlling for other confounders. The coefficient for the 26-40 age group (p =0.089), and 41-65 age group are not statistically significant (p=0.145) (Table 4).

Table 4: Multivariate analysis of mean platelet volume (MPV) among cases and controls, stratified by gender and age group

Dependent: Mean platelet volume	Characteristics	Unit Value: Mean SD	Coefficient (univariable)	Coefficient (multivariable)
Group	Control	6.9 ± 0.2	-	-
	RAS	8.9 ± 0.3	1.91 (1.81 to 2.01, p<0.001)	1.97 (1.85 to 2.09, p<0.001)
Gender	Female	8.1 ± 1.0	-	-
	Male	7.7 ± 1.0	-0.36 (-0.73 to 0.01, p=0.056)	0.02 (-0.09 to 0.12, p=0.722)
Age group (year)	13-25	8.4 ± 0.9	-	-
	26-40	7.7 ± 1.0	-0.72 (-1.09 to -0.36, p<0.001)	0.10 (-0.02 to 0.22, p=0.089)
	41-65	7.0 ± 0.2	-1.37 (-2.11 to -0.63, p<0.001)	0.18(-0.06 to 0.42, p=0.145)

DISCUSSION

Our findings show that MPV is statistically higher in patients with RAS as compared to healthy control and the mean value of PV was higher in females and younger ages. Recurrent aphthous stomatitis (RAS), also called canker sores, is a condition where painful sores or ulcers appear in the mouth [17]. The cause is not fully known, but it's believed to be linked to genetics, the immune system, and environmental factors. Triggers may include stress, mouth injuries, certain foods, hormonal changes, and infections [8]. Platelets are tiny blood cells that play a crucial role in blood clotting, wound healing, and inflammation. The MPV test measures the size of platelets in the blood, with larger platelets indicating increased platelet activity [9]. Research has suggested that higher MPV levels may be associated with increased inflammation and more severe inflammatory conditions [6, 18]. Our findings showed that the mean MPV in the RAS group (8.86 ± 0.33) was significantly higher (p<0.001) than in the control group (6.95 ± 0.2). In a previous matched case-control study that included 80 cases of RAS and controls, the MPV values between cases (262.3±43.89 K/µL) and controls (253.6 ± 67.37 K/µL) were not significantly different (p >0.05) [19]. Many factors can play a role in the differences observed in these results, such as differences in the selection criteria of the study participants, inclusion of patients with more severe or active RAS, variations in the laboratory methods used to measure MPV values, and differences in the demographic or clinical characteristics of the study participants, such as age, gender, medical history, or medication use. Ekiz *et al.*, conducted a study that included 60 patients diagnosed with RAS, as well as 60 healthy individuals as a control group [18]. They reported that the RAS patients had significantly higher mean platelet volume (MPV) compared to the control group. This finding suggests that platelet activity may be higher in RAS patients and may contribute to the development or severity of the condition. The current study found that the mean MPV value was higher in females and younger age groups. This could be attributed to hormonal changes that occur during menstruation, which can affect platelet function and increase MPV levels [20]. Another matched case control prospective study by Turan *et al.*, on 260 participants reported the MPV was significantly less in RAS than healthy control. They also reported that erythrocyte sedimentation rare and neutrophil count was higher in RAS than healthy control [21]. Due to a more responsive and active immune system, young age participants may also have high platelet count resulting in increased platelet activity and inflammation. The differences in MPV values between aphthous patients and healthy controls may due to other factors, like lifestyle habits (smoking and drinking alcohol), underlying medical conditions (autoimmune disorders), or medication use [22]. However, to explore the underlying mechanism for association of MPV and RAS and their

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predicting factors, more rigorous research is warranted.

CONCLUSIONS

The study provides some evidence that patients with RAS have higher mean platelet volume (MPV) compared to healthy controls, indicating increased platelet activity and potential involvement in the pathogenesis of RAS. The study also suggests that the mean MPV value is higher in females and younger age groups.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Carvidelol Vs Propanol for Secondary Prophylaxis of Variceal Hemorrhage in Liver Cirrhosis Patients

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ABSTRACT

Propranolol and Carvedilol are the currently used medications for main prophylaxis of variceal bleeding. **Objective:** To investigate the efficacy of carvedilol vs propranolol for prevention of variceal hemorrhage in liver cirrhosis patients. **Methods:** This prospective comparative study was carried out on 196 cirrhotic patients in the Gastroenterology Department of Lady Reading Hospital, Peshawar in collaboration with Pharmacology department of Khyber Medical University, Peshawar from July 2018 to June 2020. Patients with no prior history of primary variceal prophylaxis treatment and variceal bleeding were enrolled. All the patients were categorized into two groups: Group-I (Carvedilol) and Group-II (propanol). Frank hematemesis, melena, and endoscopic assessment was used for the evaluation of variceal bleeding. **Results:** Of the total 196 liver cirrhosis patients, Group-I and Group-II had 102 (52%) and 94 (48%) respectively. Ultrasonography found splenomegaly in 88% of cases and moderate to severe ascites in 42.6% of the patients investigated. The success rate of carvedilol and propanol group was 76% and 64.8% respectively. The side-effects and complication rate were significantly lower in Group-I than Group-II. The prevalence of variceal bleeding was 16.7% (n=17) and 11.7% (n=11) respectively. **Conclusions:** Carvedilol is an excellent treatment alternative for prevention of variceal bleeding than propranolol in terms of side-effects and complications rate.

INTRODUCTION

Gastric varices and bleeding esophageal are major complications of portal hypertension which increase the mortality rate by one-third in liver cirrhosis patients [1]. The mortality rate of variceal bleeding varied from 10% to 20% [2, 3]. The variceal hemorrhage advance treatment has significantly lowered the mortality rate, bleeding recurrence risk, and gastroesophageal varices rupture [4]. For variceal prophylaxis of medium or large varices, band ligation, carvedilol, and propranolol were advised beta-blockers. Based on knowledge and available resources, contraindications, features, side effects, and preferences of patients should be considered [5]. Carvedilol is a viable option that has recently been studied for decreasing portal hypertension. NSBBs, mainly carvedilol, are used as stand-alone medicinal treatment in primary prophylaxis to avoid variceal hemorrhage and the formation of ascites [6, 7].

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The conventional preventative treatment for individuals who have previously bled is a mix of medicinal and endoscopic therapy [8]. Moreover, earlier research has recognized NSBBs as the secondary prophylaxis cornerstone since their endoscopic band ligation (EBL) significantly improves outcomes [9, 10]. The risk of re-bleeding and mortality is notably low when patients' HVPG drops by 20% or to an absolute value of 12 mm Hg (HVPG response) [11]. Previous studies have evaluated the hemodynamics response of carvedilol: In a brief pilot trial of 16 patients, HVPG fell from 16.7 to 13.6 mm Hg without a substantial drop in azygos blood flow [12]. Mean artery pressure (MAP) fell from 94.8 to 84 mm Hg, however only in individuals with ascites did heart rate fall. The present study aimed to assess the efficacy of carvedilol vs propanol for secondary prophylaxis of variceal hemorrhage in liver cirrhosis patients.

METHODS

This prospective comparative study was carried out on 196 cirrhotic patients in the Gastroenterology Department of Lady Reading Hospital, Peshawar in collaboration with Pharmacology Department of Khyber Medical University, Peshawar from July 2018 to June 2020. Patients with no prior history of primary variceal prophylaxis treatment and variceal bleeding were enrolled. In order to detect the difference in responder's proportion 0.32 by assuming the propranolol and carvedilol group response rate 37% and 63% respectively taken average of previously reported response, 80% statistical power, and 5% level of significance. Considering a 25% drop-out patients' rate, 100 patients should be allocated for each group. However, we had challenges in recruiting the study subject, and 196 patients were finally considered. Patients who refused to participate, suffering from liver cirrhosis, chronic kidney disease, neoplastic disease, and showed contraindication to beta blockers such as uncontrolled diabetes, asthma, heart failure, obstructive pulmonary disease, arteria hypotension with SBP <90 mm Hg, atrioventricular block, and bradycardia with HR ≤40 bpm were excluded. The diagnostic criteria for liver cirrhosis patients included clinical signs such as splenomegaly, ascites, and collateral venous presence, endoscopic signs i.e., esophageal varices, ultrasound signs such as enlarged portal vein >15 mm, periportal fibrosis, splenomegaly, and portosystemic collaterals. All the patients were categorized into two groups: Group-I (Carvedilol) and Group-II (propanol). Frank hematemesis, melena, and endoscopic assessment was used for the evaluation of variceal bleeding. All the patients underwent full history-taking, prior hematemesis and melena attack's history, clinical examination, ischemic heart disease, asthmatic attacks, liver cell failure, and hypertension. Viral marker, CBC, blood glucose, renal function tests, and profile of liver biochemical were tested. Liver size, liver cirrhosis existence, splenomegaly, portal vein thrombosis, ascites, and hepatocellular cancer was confirmed through abdominal ultrasonography. SPSS version 27.0 was used to collect and statistically evaluate data.

RESULTS

Of the total 196 liver cirrhosis patients, Group-I and Group-II had 102 (52%) and 94 (48%) respectively. Out of total, there were 60 (30.6%) male and 136 (69.4%) female. The overall mean age of patients in group-I and group-II was 50.6 ± 6.4 years and 50.2 ± 10.6 years respectively. The most prevalent cause of cirrhosis and portal hypertension was HCV found in 68% cases in Group-I as compared to 74% in Group-II. Ultrasonography found splenomegaly in 88% of cases and moderate to severe ascites in 42.6% of the patients investigated. The success rate of carvedilol and propanol group was 76% and 64.8% respectively. The mean dosage of carvedilol and propanol group patients was 12.48 ± 6.28 mg/day and 42.82 ± 7.28 mg/day. The side-effects and complication rate were considerably lower in Group-I than Group-II. The prevalence of variceal bleeding was 16.7% (n=17) and 11.7% (n=11) respectively. There was no statistically significant difference between patient groups I and II. Table-I represents the comparison of baseline characteristics of group-I and group-II patients.

Table 1: Baseline characteristics of patients

Parameters	Group-I (Carvedilol) N=102	Group-II (Propranolol) N=94
Age (years)	50.6 ± 6.4	50.2 ± 10.6
Gender N (%)		
Male	36 (35.3)	24 (25.5)
Female	66 (64.7)	70 (74.5)
Chronic HCV (%)	68	74
Chronic HBV	18	16
ALT (IU/L)	56.38 ± 36.68	42.62 ± 31.86
AST (IU/L)	54.52 ± 34.63	48.84 ± 32.82
T. bilirubin (mg/dl)	3.12 ± 2.42	2.68 ± 1.86
Creatinine (mg/dl)	2.58 ± 0.49	2.58 ± 0.64
Hemoglobin (g/dl)	107.72 ± 45.84	97.82 ± 54.38

Abdominal ultrasonography findings in both groups are shown in Table 2.

Table 2: Abdominal ultrasonography findings in both groups

Abdominal ultrasonography findings	Group-I (Carvedilol) N=102	Group-II (Propranolol) N=94
Shrunken liver (%)	26	28
Splenomegaly (%)	88	94
Moderate/marked ascites (%)	24	32

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Endoscopic findings and pathological grading of patients compared in both groups are shown in Table 3.

Table 3: Endoscopic findings and pathological grading of patients compared in both groups

Endoscopic findings	Group-I (Carvedilol) N=102	Group-II (Propranolol) N=94
Medium/large varices (%)	66/34	62/38
Portal hypertensive gastropathy mild/severe (%)	42/58	64/36
Pathological grading Mild/ moderate/severe (%)	42/22/36	44/32/24

Comparison of side effects, success rate, and child score in both groups are represented in Table 4.

Table 4: Comparison of side effects, success rate, and child score in both groups

Parameters	Group-I (Carvedilol) N=102	Group-II (Propranolol) N=94
Side effects	16.4%	36.8%
Success rate	76%	64.8%
Child score	12/36/52	10/24/66

DISCUSSION

The present study mainly investigated the efficacy of carvedilol vs propanol for secondary prophylaxis of variceal hemorrhage in cirrhotic patients and found that carvedilol is a better therapeutic option than propranolol for preventing variceal bleeding. Carvedilol generates greater decreases in HVPG than propranolol in secondary prophylaxis of variceal bleeding, which is associated with a lower risk of re-bleeding, extra nonbleeding decompensation, and liver-related death. Carvedilol group had lower complication rate and side effects than propanol group. The current study suggested therapy choices among the several proposed treatments. Additionally, the current investigation compared and validated the effectiveness, side effects, and outcomes of carvedilol and propranolol for prevention of variceal bleeding. Meta-analyses by Sersté *et al.*, eliminated the greater success rate of carvedilol because this marginal benefit is impacted by technical considerations, since carvedilol is operator dependent; endoscopist expertise combined with good technique impacts the outcomes [13, 14]. Regarding other aspect of non-selective β -blockers such as propranolol might show uncertainty in causing the hepatorenal syndrome or acute kidney injury by reducing patient's survival rate in liver cirrhosis decompensation [15]. Carvedilol has more strong hemodynamic effects than propranolol, as well as a larger risk for causing systemic hypotension and potentially circulatory malfunction [16]. However, in order to attain the desired HR, a greater dosage of carvedilol (25 mg/day) was required. Notably, continuous treatment of low-dose carvedilol may contribute to a significant decrease in HVPG without causing severe systemic hypotension. Carvedilol has a favorable response in patients with ascites and has no significant adverse effects. Our findings further suggest that 6 weeks of low-dose carvedilol is not only similar to propranolol, but substantially more successful in lowering portal pressure in patients with decompensated liver cirrhosis, despite the fact that none of our patients had a CP score of 12 or refractory ascites [17]. The propranolol group had a higher risk of extra medication-related issues, which lowered compliance and drug intake when compared to other lines of treatment. The recurrence rate of varices after band ligation removal was 13.6% after a year of follow-up. Its recurrence rate is comparable to that of Kim *et al.*, [18]. In our experiment, carvedilol had a better success rate than propranolol, with fewer side effects that did not need drug withdrawal. Prior research has demonstrated that carvedilol is an effective medicine for the primary prevention of variceal bleeding, with a favorable prognosis and few side effects [19]. The liver cell failure and severity, as measured by the Child score, was assessed throughout a one-year period in order to determine the variceal prophylaxis primary effect. Although advanced Child scores have previously been linked to failure to control variceal bleeding and re-bleeding [20, 21], Child C patients were not linked to treatment failure. Propranolol and carvedilol dramatically improved portal hypertensive gastropathy [22, 23]. In contrast to beta-blockers, which do not lower portal pressure [24]. Hence, the severity of side effects, the experience of the treating physician, as well as patient and compliance, influence the choice of treatment strategy for primary variceal hemorrhage prevention. Further research using carvedilol for primary prevention of variceal bleeding is encouraged, with results compared to combination therapy with band and propranolol or each preventative approach alone.

CONCLUSIONS

Carvedilol is an excellent treatment alternative for prevention of variceal bleeding than propranolol in terms of side-effects and complications rate. In secondary prophylaxis of variceal bleeding, carvedilol induces superior reductions in HVPG than propranolol, and so is related to decreased incidence of re-bleeding, additional nonbleeding decompensation, and liver-related mortality.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Comparison of Intra Cardiac Echo (ICE) Guided Verses Non- Intra Cardiac Echo Radiofrequency Catheter Ablation of Cavotricuspid Isthmus dependent Atrial Flutter

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ABSTRACT

The isthmus-dependent atrial flutter can be effectively treated with Radiofrequency (RF) catheter ablation. **Objectives:** To compare the ICE guided versus non-ICE radiofrequency catheter ablation of Cavo tricuspid isthmus dependent atrial flutter. **Methods:** A cross-sectional study was carried out on 40 patient's atrial flutter data in the Cardiac Electrophysiology Department, Hayatabad medical Complex Peshawar, Pakistan from August 2017 to August 2022. Patients were categorized into two groups: Group-I (ICE-guided RF catheter ablation) and Group-II (non-ICE RF catheter ablation). The standard protocol of ablation was followed using 40-50 watts power at temperature 60°C. In the case of an irrigated cooled tip catheter, the flow was limited to 30 mL/hour and the power was limited to 30 watts. **Results:** The overall mean ablation and flouro time was 9.44 ± 6.93 minutes and 20.64 ± 9.77 minutes respectively. The frequency of patients in Group-I and Group-II was 29 (72.5%) and 11 (27.5%) respectively. Out of the total patients, about 8 (20%) patients had shown failed status in terms of procedure success, out of which 5 (62.5%) were from Group-II. Compared to non-ICE guided procedure, the ICE guided procedure had lesser flouro and ablation time with higher rate of success and lower complications and recurrence. **Conclusions:** The present study observed that intracardiac echocardiography (ICE) can effectively disclose the Cavo tricuspid isthmus and guide ablation anatomy. Additionally, ICE guided radiofrequency catheter ablation had higher success rate, less flouro and ablation time, and lower complications than non-ICE guided radiofrequency catheter ablation.

INTRODUCTION

Isthmus-dependent atrial flutter (AFI) has been treated with standard protocol of Radiofrequency (RF) catheter ablation [1]. A frequent arrhythmia is atrial flutter [2]. The mechanism is known as a reentry circuit [3]. When the CTI is used in the circuit, CTI dependent flutter or usual flutter occurs [4]. Atypical flutter, also known as non-isthmus-dependent atrial flutter, occurs when the circuit rotates around scar tissue. Flutter can occur in either a clockwise or anticlockwise direction. The rate of atrial flutter in its circuit can exceed 350 beats per minute, however ventricular conduction is reduced due to the decremental features of the atrio-ventricular node (AV node) [5]. Its reentrant circuit revolves around the tricuspid valve annulus (TV), with the CTI being the primary location of sluggish conduction. The crista terminalis protects the shortcut activation towards the posterior right atrium (CT). Pharmacological therapy is rarely helpful in converting AFL and in controlling the elevated ventricular rate during continuous arrhythmia [6, 7]. Intracardiac echocardiography (ICE) is the implantation of ultrasound probe on catheter tip, which is subsequently delivered through peripheral blood arteries to the heart cavity. As a result, this approach allows for exact heart architecture imaging without the interference of air or other variables,

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resulting in optimal results [8]. ICE may quickly assess the safety and effectiveness of ablation by monitoring the creation, location, amount, and degree of ablation damage. Moreover, ICE continually monitors and evaluates the location and severity of problems [9, 10]. Furthermore, by functioning in the correct cardiac system, ICE may exhibit all cardiac edifices and precisely pinpoint the pulmonary sinus. Reduced radiation, and elimination of the general anesthesia requirement were the additional advantages of ICE [11, 12]. Atrial flutter management options are not straightforward. Overdrive pacing, antiarrhythmic medications, or electric cardioversion may be used to return the patient to sinus rhythm. Cardioversion and overdrive pacing cannot ensure sustained sinus rhythm, and recurrence is possible [13, 14]. Moreover, anticoagulation is required for certain treatments. Instead, the patient may be required to take anti-arrhythmic as well as anticoagulants for the rest of his or her life, despite the danger of antiarrhythmic and anticoagulant medication problems. Patient adherence to such complex regimens may be another issue [15]. The success rate of ablation in typical flutter is highly reasonable and cost effective, although it is acceptable in atypical flutter [16, 17]. Fluoroscopy and electrocardiographic guiding are used to perform atrial flutter ablation. Because to the complex and varied architecture of the CTI, fluoroscopy alone is insufficient to portray the endocardial surfaces and anatomic features essential for exact localization [18]. Nevertheless, using ICE during ablation boosts the success rate, minimizes recurrence, and reduces the incidence of complications by many folds [19].

METHODS

A cross-sectional study was carried out on 40 patient's arterial flutter data in the Cardiac Electrophysiology Department, Hayatabad Medical Complex Peshawar, Pakistan from August 2017 to August 2022. Patients of either gender ≥18 years were enrolled. Patients with atypical atrial flutter and scar associated flutter were excluded. Patients were categorized into two groups: Group-I (ICE-guided RF catheter ablation) and Group-II (non-ICE RF catheter ablation). The standard protocols of ablation were followed using 40-50 watts power at temperature 60°C. In the case of an irrigated cooled tip catheter, the flow was limited to 30 mL/hour and the power was limited to 30 watts. Cavotricuspid isthmus (CTI) was identified, and booster burns were performed. All patients with atrial flutter who were hemodynamically stable were electively scheduled for radiofrequency ablation. They were anticoagulated for four weeks before to the elective operation using new anticoagulants. The anticoagulant was discontinued 24 hours before the elective operation. An ECG baseline and transthoracic echocardiography were performed. Several outcomes were measured, including procedure length, fluoroscopy time, and RF time evaluation, post-procedural problems, and procedural success. SPSS version 26.0 was used for data analysis.

RESULTS

Of the total 40 arterial flutter patients, there were 28 (70%) male and 12 (30%) females. The overall mean age was 43.6±12.48 years. The overall mean ablation and flouro time was 9.44±6.93 minutes and 20.64 ± 9.77 minutes respectively. The frequency of patients in Group-I and Group-II was 29 (72.5%) and 11 (27.5%) respectively. Of the total patients, about 8 (20%) patients had shown failed status in terms of procedure success, out of which 5 (62.5%) were from Group-II. Compared to non-ICE guided procedure, the ICE guided procedure had lesser flouro and ablation time with higher rate of success and lower complications and recurrence. The demographic details and clinical characterization compared in ICE guided and non-ICE guided radiofrequency catheter ablation of CW isthmus dependent arterial flutter are shown in Table 1.

Table 1: Demographic details and clinical characterization compared in ICE guided and non-ICE guided radiofrequency catheter ablation of CW isthmus dependent arterial flutter

Parameters	Group-I (N=29)	Group-II (N=11)	p-value
Age (years)	44.6 ± 13.52	45.8±14.56	0.005
Gender N (%)			
Male	22 (75.9)	6 (54.5)	NS
Female	7 (24.1)	5 (45.5)	
BMI Kg/m2	28.6+2.9	27.4+2.6	0.07
Flouro time (minutes)	17.08±7.57	18.86±8.67	0.01
Ablation time (minutes)	9.89±7.88	10.34±8.83	0.01
Diabetes N (%)	2 (6.7)	4 (36.4)	0.72
Hypertension (%)	5 (17.2)	6 (54.5)	0.07

DISCUSSION

The present study mainly compared the ICE guided versus non-ICE radiofrequency catheter ablation of CW isthmus dependent arterial flutter and found that Cavo tricuspid isthmus can be efficiently shown and guided by intracardiac echocardiography (ICE). Furthermore, as compared to non-ICE guided radiofrequency catheter ablation, ICE guided radiofrequency catheter ablation had a greater success rate, less flouro and ablation time, and fewer complications. These findings were comparable to a previous study by Zhang *et al.*, and Benhayon *et al.*, [20, 21]. Additionally, over time, the broad muscle ridge of the Eustachian valve will prevent the tip of the ablation catheter from reaching the CTI, causing it to dangle above the CTI and fail to transmit energy to the ablation site [22]. The catheter must then be turned around on the muscle ridge to reach the CTI. This cannot be accomplished using

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fluoroscopy or a three-dimensional activation mapping method. Since appropriate block is not produced at CTI, this not only raises the incidence of complications but also the frequency of recurrence [23]. Moreover, ICE allows for no fluoroscopy throughout the procedure, which benefits both the patient and the operator by avoiding radiation-related problems such as carcinogenesis and tissue remodeling. ICE does not require General anesthetic and allows the patient to remain awake, move as needed, and be aware of potentially life-threatening events occurring throughout the procedure. Furthermore, when technical limits with the use of TEE develop, most notably the inability to swallow a probe, undergo anesthesia previously, or numerous pathological conditions that prevent esophageal access, the patient can be reliably directed to ICE [24, 25]. Using ICE for atrial flutter ablation is a highly successful way for treating AFL permanently. The procedure allows for a real-time, intra-procedure assessment of the CTI and LAA anatomical parameters, may detect the existence or development thrombi, and has a very high success rate with a low complication rate. As compared to fluoroscopic study by Ventura *et al.*, ICE avoids the use of radiation, does not need anesthesia, and reduces the total procedure duration, RFA time, and exposure [26]. ICE is critical in recognizing and monitoring procedural complications. The use of ICE to evaluate the heart in real time assists operators in determining the likely causes of difficulties and implementing remedial actions to reduce the negative repercussions [27]. The most significant consequences that arise during the ablation procedure are pericardial effusion and cardiac tamponade.

CONCLUSIONS

The present study observed that intracardiac echocardiography (ICE) can effectively disclose the Cavo tricuspid isthmus and guide ablation anatomy. Additionally, ICE guided radiofrequency catheter ablation had higher success rate, less flouro and ablation time, and lower complications than non-ICE guided radiofrequency catheter ablation.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Frequency of Low Back Pain and its Association with Functional Ability in Engineers

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ABSTRACT

Low back pain (LBP) is the most common health problem among workers; most workers experience this issue during their lives. There are some psycho-social factors interlinked with LBP including hostile work environments, long working hours & overtime working hours. **Objective:** To determine the frequency of low back pain in engineers and to evaluate the association between functional ability and low back pain in engineers. **Methods:** A descriptive Cross-Sectional study was conducted, and the data were collected through a convenient sampling technique from Rawalpindi, Islamabad, and Malakand. The duration of the study was 6 months after synopsis approval. Data collection were done using a self-structured questionnaire containing demographic data and clinical characteristics. Visual analogue scale for pain (VAS pain) and Back pain functional scale (BPFS) were used to assess pain and functional abilities. **Results:** There were 85.9% Males and 24.1% females in this study. The point prevalence of LBP was 36.7% and the 12-month prevalence was 63.3%. There was a moderate association found between the severity of LBP and functional ability [(r= -0.59), p < 0.001]. **Conclusions:** The **s**tudy concluded that the prevalence of LBP is found in engineers. A moderately significant association was found between the severity of LBP and functional ability in engineers.

INTRODUCTION

LBP, which affects the majority of workers at some point in their life, is the most common medical problem impacting workers. Multiple psychosocial risk factors, such as unpleasant occupational settings, long workdays, and overtime, are linked to low back pain [1]. A sedentary lifestyle, intense physical activity, frequent bending, twisting, lifting, prolonged sitting or standing, obesity, and many ergonomics components are among the many risk factors for LBP [2]. A high correlation between these risk factors and LBP is also supported by a wealth of data. Age, gender, and physical activity are all independent factors, and it is unclear to what extent they influence back pain [2]. When seen from an ergonomics perspective, LBP has been portrayed as a condition affecting engineers due to the recognition of occupational dangers that contribute to LBP. Engineers may experience job-associated LBP due to organizational elements like heavy lifting, body vibration, and physically demanding labor, as well as individual characteristics like age, gender, smoking, and muscle strength related to working circumstances [3]. In a variety of occupations, people adopt the postures of sitting, standing, and forward head. It's important to maintain optimal ergonomics for those that require prolonged durations of posture in one position [4]. Low back pain can be minimized by weight - loss and exercising. Exercise is only effective in association with education. Patients should be given a comprehensive overview of the history, etiology, prognosis, and mechanism. A variety of drugs can

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be used to treat low back pain, including opioids, muscle relaxants, and nonsteroidal anti-inflammatory drugs. Manual therapy, exercise, and superficial heating are non-invasive remedies for low back pain [5]. In addition to receiving specialized training, physical therapists can treat low back pain with electrotherapies, such as TENS, hot packs, ultrasound, and needle therapy. To increase muscle performance, isometric training is frequently performed. Correct posture promotes both bodily and psychological well-being. The physiotherapy program was discovered to be more effective at reducing chronic pain. A good care plan is beneficial in reducing back discomfort [6]. Aparajita *et al.*, concluded that most aircraft maintenance engineers (56.3%) does work with high-risk work position and 62.5% of them has low back pain with minimal disability [7]. Study by Olana reported that the prevalence of self-reported low back pain was 58.2%. It was concluded that load of work, provision of occupational health and safety training is highly significant factors for developing LBP among worker involved in ammunition engineering industry [8]. Hameed depicted that LBP is major work-related musculoskeletal disorder among IT professionals. It concluded that 54% male's employees and 48% female employees have reported LBP [9]. As per existing literature, the problem of low back pain is increasing day by day in engineers. To the best of our knowledge, at national level there is no published data found to determine the frequency of low back pain in engineers and none of the literature was published to find association between low back pain and functional ability in engineers. This study will advance the body of knowledge, and this will give context for additional research and raise awareness of the problem among engineers. The objective of the study was to determine the frequency of low back pain in engineers and to evaluate the association between functional ability and low back pain in engineers.

METHODS

A descriptive Cross Sectional study design was used. The data were collected from different work fields, Pakistan engineering councils, and software houses in Rawalpindi, Islamabad and Malakand. The duration of study were 6 months after approval by ethical review committee of Margalla institute of health sciences. Data were collected after taking written informed consent from all participants. Sample size was calculated by using Rao soft software. Recommended Sample size was 285. In this study, convenient (non-probability) sampling technique was used. Both male and female engineers with age 24 years or above and having working experience of minimum six months [10] were included in the study while participants were excluded if they have any neurological disorder, pregnancy, history of back fracture and back surgery within last three months [11], any infectious and inflammatory or systematic diseases. Data collection were done using a self-structured questionnaire containing demographic data and participants characteristics. The study variables for this study were low back pain and functional ability. Low back pain among engineers was measured by VAS pain and is defined as pain on the posterior side of body that is localized from lower margin of 12^{th} ribs to lower gluteal fold with or without involving legs. The VAS pain consists of a 10cm line, with two end points representing 0 ('no pain') and 10 (severe pain). It is a validated, subjective tool used for acute and chronic pain assessment [12]. For the evaluation of functional ability in engineers with back pain, Back pain functional scale (BPFS) was used. Functional ability in this study is defined as the ability to perform activities of daily living independently. BPFS was developed by Rantonen *et al.*, and consisted of 12 questions to evaluate the loss of function caused by LBP [11]. Each item has a score between 0 and 5. The total score of the scale is 60. The greater the score indicates the maximum functional ability. The BPFS has been shown to have sound reliability and validity measurement properties for assessing the functional status of LBP patients [7]. Data collected were analyzed through SPSS version 21.0 (Statistical Procedure of Social Sciences) software. Descriptive statistical analysis (mean, frequency and percentage) was used to analyze the data. The association between functional ability and severity of low back pain was assessed by Pearson coefficient.

RESULTS

A total number of 315 participants were approached for this study. They were asked to fill the questionnaires distributed to them. As a result of not meeting the study's eligibility requirements, 10 of the 315 participants were excluded. Out of 10 participants, 5 had inflammatory diseases, 2 had back fractures in the last three months, 1 had spinal cord disease, and 2 had neurological disorders; therefore, a total of 305 questionnaires were evaluated for the study. The demographics and the participant's characteristics have been shown in Table 1.

Table 1: Participants demographics and characteristics

Variables		Mean ± SD/ F (%)
Age (years)		33.8±7.90
BMI		24.54±4.38
Gender	Male	262(38.7)
	Female	43(61.3)
Fields	Civil	85 (27.9)
	Software	80(26.2)
	Mechanical	32(10.5)
	Electrical	59(19.3)

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	Architecture	13(4.3)
	Chemical	16(5.2)
	Electronics	9(3.0)
	Telecommunication	8(2.6)
	Agriculture	3(1.0)
Common Position	Sitting	156 (51.1)
	Forward bending	38 (12.5)
	Standing	85 (27.9)
	Sitting and standing	26 (8.5)
Rest during working hours	Yes	257(84.3)
	No	48(15.7)

As shown in Table 2; the point prevalence of low back pain is 36.7% while 12 months prevalence is 63.9%. The mean score of pain intensity was 4.6±2.03. The mean functional ability score on BPFS was 49.03±10.82. There is moderate significant association found between severity of low back pain and functional ability in engineers. [(r= -0.59), p< 0.001]

Table 2: Prevalence of low back pain among engineers and mean score of VAS pain and BPFS

Variables	Mean ± SD/ F (%)
LBP point prevalence	112(36.7)
LBP 12-month prevalence	195(63.9)
VAS pain (0-10) cm	4.6±2.03
BPFS (0-60)	49.03±10.82

DISCUSSION

In this study, the mean age of participants was 33.82±7.90 years that is consistent with the results of previous studies (30-36 years) [13-15]. The mean value of BMI in this study was 24.54±4.38 while the study conducted by Hameed and Ekechukwu *et al.*, the mean value of BMI was 25.23±3.42 and 22.89±3.37 respectively. These results are in line with the results of our study [9, 16]. There were 85.9% Males and 24.1% female in this study. Similarly, there were mainly male participants in earlier investigations [8, 9, 16, 17]. In our study, the participants reported average total working hours per day was 8.47±1.63 while in a study conducted by Olana, the average working hours per day was 9-10 hours. In another study done by Aparajita *et al.*, the mean value of total working hours per day was ≤ 8 hours [7, 8]. The result of this study reported that 84.3% of participants take rest during working hours. The results reported by Olana stated that 78.8% of participant take rest while at work [8]. Another study done by Aparajita *et al.*, reported that 48% of the participants take rest greater than 30 minutes [7]. These results are also consistent with our results. In accordance with the findings of our study, the point prevalence of LBP was 36.7% and the 12-month prevalence was 63.3%. Hameed, depicted that 50% of their participants reported LBP during the last week [9]. Another study concluded that 12-month prevalence of LBP is 58.2% [8] and Adhikari *et al.*, reported 52% prevalence of LBP during the last year [17] while Rajguru and Mangle, highlighted that respondents reported 85% prevalence of LBP [18]. The rate of prevalence of LBP is higher in this study because this study included only architecture engineer and as reported by author poor workstation ergonomics, site visits and remain in faulty postures are the risk factors for developing musculoskeletal disorders [18]. There is moderate association found between the severity of low back pain and functional ability [(r= -0.59), p < 0.001]. No previous study found association between severity of low back pain and functional ability in engineers however earlier studies conducted over young adults also concluded that there is significant association found between severity of low back pain and functional ability [19, 20]. As the result of this study depicted that low back pain is common in engineers so it is recommended that ergonomic assessment and proper postural awareness program should be conducted for engineers.

CONCLUSIONS

This study concluded that prevalence of low back pain is found in engineers. There is moderate significant association found between the severity of low back pain and functional ability in engineers.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Knowledge Regarding Risk Factors of Phlebitis and its Association with Education Among Nurses at Tertiary Care Hospital, Karachi

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ABSTRACT

Phlebitis is the inflammation of a vein, typically in the legs, due to a blood clot or other causes. Risk factors for developing phlebitis include prolonged immobility, age, family history, obesity, smoking, and certain medical conditions, such as cancer, heart disease, and inflammatory bowel disease, which can increase the risk of phlebitis. **Objective:** To assess the knowledge regarding risk factors of phlebitis and its association with nurses' education among nurses at a tertiary care Hospital in Karachi. **Methods:** This cross-sectional analytical study was conducted at a tertiary care hospital in Karachi from September to December 2022. A total of 53 nurses were part of the study, and a convenient sampling technique was used to approach the participants. The data were collected through a valid and reliable tool. **Results:** Study results show that Among 53 participants, the male participant 26(49.1%), whereas the female participant was 27 (50.9%). Study results also found that 17.0% of nurses have High-level knowledge, whereas 83.0% of the participants have moderate, level knowledge about the risk factors of phlebitis. Moreover, the study found no significant difference between the knowledge score and the nurses' education p-value of 0.794. **Conclusions:** These findings suggest that nurses may need further education and training regarding the risk factors of phlebitis, as most nurses have only a moderate level of knowledge. Investigating other factors impacting nurses' knowledge may also be essential, such as work experience and training programs.

INTRODUCTION

A peripheral intravenous catheter is essential for administering intravenous medication, fluids, nutritional supplements, and blood sampling in admitted patients. In addition, phlebitis is the inflammation of the walls of the vein (veins are the blood vessels in your body that carry blood from organs and limbs back to the heart) [1, 2]. In addition, its appearance is in the form of local edema and inflammation, discomfort, redness of the skin, or erythema. It mainly happens when the protocol of intravenous cannulation is not followed correctly by aseptic techniques. Moreover, the triggering risk factors of phlebitis include infusion flow rate, pre, and post-bolus, 3-4 days of I/V cannulation, or a catheter retained for a more extended period [3]. However, the risk factors (risk factor that increases a person's chance of developing a disease) for developing phlebitis are patient characteristics, administration of intravenous medications, nursing practices, and cannula characteristics [4]. Possible risk of infection includes manual skills, technical skills, and the expertise of pharmaceutical therapies skills. These intravenous catheterization risks and complications can affect the clinical condition, well-being, and potential result of a patient needing a peripheral catheter inserted in another location [5]. Furthermore, the risk is characterized by four groups: patient characteristics, the therapy administered, health professional practice, and cannula

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characteristics. However, to reduce the risk factor of phlebitis and to evaluate the nurses' understanding of the phlebitis risk factors. Assess the cannula from the 1st day the patient is admitted to the hospital [6]. Phlebitis is a common condition among patients, and nurses play a critical role in its prevention and management. However, there is limited research on the extent of nursing knowledge about the risk factors of phlebitis and how it may be influenced by education level [7]. Therefore, the research aims to assess nursing knowledge regarding the risk factors of phlebitis and its association with nurses' education levels. This study will contribute to identifying any gaps in nursing knowledge about phlebitis risk factors and provide insight into whether education level plays a significant role in this knowledge.

METHODS

A descriptive cross-sectional analytical study was conducted at Tabba Kidney Hospital Karachi, Pakistan, from September to December 2022. A total of 53 nurses were part of the study, and a convenient sampling technique was used to approach the participants. Moreover, the sample size was calculated through open EPI version 3.0 with a population of 60, a confidence interval of 95%, and the obtained sample size is 53. Data were collected using a questionnaire prepared with the help of the literature [8]. The tool consists of two components I is socio-demographic data which has three questions (Age, Gender, Education), and II component is knowledge assessment questions which contain 19 questions. The knowledge scoring system is 0-2, where 0 means don't know, 1 means no, and 2 means yes. The total score of the tool is 38, and below 50% is considered low-level knowledge, 50% to 80% is moderate-level knowledge, and above 80% is considered high-level knowledge. Furthermore, a piloting study was conducted on 10% of the sample size, which contained 6 participants, which resulted in 0.790, which shows that the tool was reliable. Before data collection, study approval was taken from the Horizon School of Nursing and Health Sciences, and data collection permission was taken from the Tabba Kidney Hospital. During data collection, the purpose and benefits of the study were explained to the participants, and the duration for data collection to complete the questionnaire was given approximately 15 minutes. Participants were informed about the purpose of the study, and a written concern was also taken by the respondents under the supervision of the principal investigator. However, it was also explained that the participant's data would remain confidential. All the questions were explained briefly to the participants. All respondents willingly participated in the study. Moreover, nurses above 18 years, both male and female and a minimum with three months of experience were included in the study. Those nurses who were unwilling to participate and Pilot study participants were excluded from the study. SPSS software version 26 is used in this study for data entry, analysis, and interpretation. The frequency table and the percentages were used to calculate socio-demographic and knowledge assessment data. Furthermore, an Independent T-test was used to associate knowledge scores with nurses' education.

RESULTS

Table 1 shows the results of the socio-demographic variables of the participants. Among 53 participants male participant was 26 (49.1%), whereas the female participant was 27 (50.9%). The percentage of diploma nursing is 62.3%, and BScN is 37.7%. Regarding the age of the participants, 20-25 is 18 (34.0%), 25-30 is 25, whereas the percentage is 47.2%, and participants who fall in the age group > 30 are 10 as their percentage is 18.9%.

Table 1: Socio-demographic Data

Variables	Frequency (%)
Gender	
Mal e	26(49.1)
Female	27(50.9)
Education	
BSN	20(37.7)
Diploma	33(62.3)
Age	
20-25	18(34.0)
26-30	25(47.2)
Above 30	10(18.9)

Table 2 results show that 17.0% of nurses have high-level knowledge, whereas 83.0% have moderate, level knowledge about the risk factors of phlebitis.3

Table 2: Overall Knowledge Score

Knowledge Score	N(%)
Moderate level of knowledge	44(83.0)
High Level of Knowledge	9(17.0)
Total	53(100.0)

Table 3 shows the result of the association of Knowledge score with nurses' education and found that there is no significant difference found between knowledge score, and nurse's education p-value is 0.794.

Table 3: Association of Knowledge Score with Nurses' Education

Variables	N	Mean	Std. Deviation	p-value
Education				
Diploma	33	22.1515	3.30833	0.794
NursingBScN	20	22.4000	3.37795	

An Independent sample T-test has been applied

DISCUSSION

Phlebitis is a common and preventable complication of intravenous therapy that can result in pain, inflammation,

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and infection [9]. It can also lead to longer hospital stays, increased healthcare costs, and reduced patient satisfaction [10]. Nurses play a critical role in preventing and managing phlebitis by identifying and addressing risk factors such as catheter insertion technique, catheter dwell time, and patient-related factors. Therefore, assessing nurses' knowledge of phlebitis risk factors is essential to improve patient outcomes and quality of care. So, this study aimed to evaluate knowledge about risk factors of phlebitis among nurses and its association with nurse's education. The study was conducted at Tabba kidney institute Karachi. The present study results show that 49.1% of male participated in the study, and 50.9% of females participated in the study, as the majority was female participants. At the same time, another study's results show that 66.7% were male respondents and 38.3% were female respondents [1]. In contrast, a study from Indonesia demonstrated that 19% of the participants were male and 81% were females [11]. These differences may reflect the two studies' research methodology and subject matter. The present study's findings indicate that a majority of the participants were in the age range of 25-30 years old (47.2%), followed by those in the age range of 20-25 years old (34.0%), and a minority of participants were above 30 years old (18.9%). Similarly, another study's findings are almost parallel to our finding and show that (41.7%) of the age was less than 30 years, whereas (50.4%) age was between 30-40 years; moreover, (7.9%) age was more than 40 years(3). The present study results show that 17.0% of nurses have high-level knowledge about the risk factors of phlebitis. Similarly, a study from Malaysia demonstrated that 56.8% of the participants had good knowledge regarding the risk factors of phlebitis [12]. Moreover, another study from Turkey shows that the majority of nurses have good knowledge regarding the risk factors of phlebitis [13]. In contrast, a study from Pakistan shows that most nurses have a poor understanding of the risk factors of phlebitis [8]. In addition, another study from Indonesia shows that 38.5% of the participants have poor knowledge regarding the risk factors of phlebitis [14]. Educating the staff nurses about the numerous phlebitis risk factors is essential. Programs for education and training should be executed appropriately [15]. The present study finding that 83% of the participants have a moderate level of knowledge about the risk factors of phlebitis highlights the need for healthcare professionals to continue learning and improving their knowledge in this area. Present findings revealed that 83.0% of participants have moderate level knowledge about the risk factors of phlebitis. Another study from Sari Lanka shows that 60.0% of the participants have a moderate level of knowledge regarding the risk factors of phlebitis [16]. Similarly, another study from India shows that 63% of the participants have a moderate level of knowledge [17]. While a moderate level of knowledge may be considered sufficient for some healthcare professionals, it is essential to note that phlebitis is a serious condition that can lead to complications if not treated promptly and effectively [18]. Therefore, nurses and other healthcare professionals should be well-versed in the risk factors of phlebitis to provide the best possible care for their patients. One way to improve the level of knowledge among healthcare professionals regarding phlebitis would be to provide ongoing education and training opportunities. This could be done through professional development programs, online courses, or workshops [7]. Additionally, healthcare organizations could provide clinical exposure opportunities to healthcare professionals in different settings, including hospitals and clinics, to increase their exposure to phlebitis patients and allow them to gain more practical experience managing this condition [14]. The current findings show no association between the knowledge score and nurses' education. Similarly, a study from China shows no association between education and the knowledge score of phlebitis [3]. It is commonly assumed that higher levels of education would lead to increased knowledge scores among nurses. However, this study suggests that this may not always be the case. Other factors, such as clinical experience, ongoing education and training, and resource access, may significantly determine a nurse's knowledge score. The lack of association between education and knowledge score also highlights the need for ongoing education and training opportunities for nurses, regardless of their level of formal education. Continuing education programs and workshops can help nurses stay up-to-date on the latest developments in their field and provide opportunities for knowledge acquisition and skills development [19-21].

CONCLUSIONS

Based on the study results, it can be concluded that the majority of nurses have a moderate level of knowledge about the risk factors of phlebitis, with only a small percentage having a high level of knowledge. Additionally, the study found no significant difference in knowledge scores based on nurses' education level. These findings suggest that nurses may need further education and training regarding the risk factors of phlebitis.

Conflicts of Interest

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Original Article

Student Nurses Knowledge of Needle Stick Injuries at a Private Institute, Karachi

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ABSTRACT

Needle Stick Injuries (NSI) are wounds penetrated to the skin by needles which can lead to infectious diseases such as Hepatitis B, C, and Human Immunodeficiency virus. **Objectives:** To determine the student nurses' knowledge of NSI at a private nursing institute in Karachi. **Methods:** Descriptive cross-sectional study design was used. A total of 67 participants were recruited through the purposive sampling technique. Data were collected through a valid and reliable questionnaire from September to November 2022. **Results:** Study results showed that 41.8% of participants were males and 58.2% were females. The majority of the participants, 62.7%, were between 20-30 years of age and had an experience of 5-10 years. 62.7% of participants have taken the vaccine against the Hepatitis B virus. Around half (53.7%) of the participants were exposed to needle stick injuries (NSI) during clinical rotations. Knowledge results showed that 22.4% of nursing students had a good level of knowledge, 17.9% moderate, and 59.7% had a low level of knowledge regarding NSI. The association was found only between clinical experience and student nurses' knowledge. **Conclusions:** Based on the findings, high prevalence of NSI, a low level of knowledge of NSI among students, and a low immunization rate of the Hepatitis B vaccine. Therefore, the institute and hospitals should conduct educational training programs and workshops to increase the knowledge level of nursing students regarding NSI and an immunization drive against Hepatitis B to protect them from the deadly virus.

INTRODUCTION

Needle stick injuries (NSI) are common occupational hazards among healthcare workers, including nursing students. These injuries occur when a sharp object, such as a needle, accidentally punctures the skin. NSIs can be dangerous as they can transmit blood-borne pathogens, such as Hepatitis B, Hepatitis C, and HIV. Nursing students are at an increased risk of NSI due to their limited clinical experience, lack of training, and inadequate knowledge of infection control practice [1]. Multiple studies showed that 3 million HCWs experience NSI each year. Similarly, it has also been linked to an increase in the prevalence of 37% Hepatitis B, 39% Hepatitis C, and 4.4% HIV globally, and numbers of NSI cases are reported in the USA and Europe, 385,000 and 100,000, respectively. Aside from this, according to WHO data, NSI causes 16000 HCV, 66,000 HBV, and 1000 HIV cases each year [2]. According to a Pakistani report, 49.7% of HCWs suffer from NSI each year; that high rate of injuries among HCWs is thought to contribute to the spread of blood-borne pathogens [3]. In addition, the factors involved include improper handling of needles, work overload, recapping of needles, lack of safer needle devices, sharp disposals, low resources, lack of proper training, immunization rate, and compliance with infection control measures can cause NSI among HCWs [4]. Various studies conducted in different countries showed different results regarding exposure to NSI among HCWs and nursing students. A study conducted in Lahore, Pakistan, in 2019 showed that 71.6% HCWs suffered from NSI, [5] in Karachi 66% were exposed to NSI, [6] in Ethiopia 43%, [7] in India, in Haryana, 30% of nursing students had NSI, [8]

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while in Maharashtra it was 25.2%, in Bangalore 74%, and in Iran, Sheraz, 76% sustained NSI [9]. The prevalence of NSI in developing countries is higher than the developed countries like Italy; the prevalence of NSI was 14.8, and in Saudi Arabia, 14.7% [10, 11]. Multiple kinds of literature are present on knowledge of NSIs. To review internationally, a cross-sectional study was conducted in Iraq's Baghdad Teaching Hospital in 2020. The study aimed to assess the knowledge, attitude, and practice of HCWs toward NSI. Study results showed that 91.5% of participants knew safety boxes, 71.2% of using double gloves in phlebotomy procedures, 96% of discarding needles after use, and 96.5% knew that Hepatitis B, C, and HIV could transmit via NSI [12]. Studies in developing countries like India, 2021, showed that 62.1% of participants knew the latest universal precautions guidelines, 70.9% always used gloves when dealing with needles, 14.3% had injuries, and 40.9% strongly believed that NSI could be prevented [13]. Likewise, in Karachi in 2016, study results showed that 51% of HCWs were aware of standard methods of discarding needles, and 80.3% were recapping needles. Only 18.6% had knowledge of post-exposure management, e.g., allowing some blood to ooze after NSI, washing the site of the prick with an antiseptic solution, and reporting to the infection control center for further management. But in developed countries like Saudi Arabia knowledge level of HCWs was very high (94.7%); 81% were aware of the procedure and what to do after having NSI, and 47.1% agreed that NSIs are preventable [14]. Therefore, this study's objectives were to determine the student nurses' knowledge of NSI and an association between knowledge level with demographic characteristics of nursing students at a private nursing institute in Karachi, Pakistan

METHODS

A cross-sectional descriptive study was conducted at Horizon Institute of Health Sciences, Karachi, Pakistan, in 2022 from September to November. The sample size was calculated through open EPI version 3.9, with a 95% confidence interval and a target population of 80 students; the obtained sample size was 67. A purposive sampling technique was used in the study; all 1st year Post RN, semester II nursing students who were willing to participate in the study and had a clinical experience of more than 6 months were included and those who were unwilling to participate and had a clinical experience of less than 6 months were excluded from the study. The adopted tool was used, and permission was taken via email[2]. A demographic tool was developed, which had 6 questions of sociodemographic data, i.e., gender, age, work experience, workplace, vaccination status, and 15 questions about NSI knowledge. It was reviewed and validated by three experts of infection control personnel, and their suggestions were incorporated into the questionnaire. Furthermore, a pilot study was also conducted for the tool's reliability on 10% of the total sample size. The questionnaire was tested for internal consistency, for which Cronbach's alpha test was performed using the reliability option in SPSS software. The alpha coefficient for 15 items was computed (0.820), suggesting that the items have relatively high internal consistency. The questionnaires and consent forms were distributed in the class in hard copy, and the study's objectives and benefits were told to the participants. A scoring system assessed nursing students; one point was given to the participant for each correct answer, while incorrect answers were assigned zero. The students' total scores ranged from 0 to 15, and total scores were classified into three categories: low level of knowledge, moderate and good knowledge. Students who scored above 80% considered a high level of knowledge regarding NSI scored between 60-80% moderate, and those below 60% had a low level of knowledge. Permission was taken from the management of Horizon Institute of Health Sciences (Ref # HSNHS 2022/276) for data collection. Every participant signed a consent form after being told about the aim and purpose of the data collection and their right to leave any time they wanted. Nursing students were also assured of their confidentiality and anonymity. Data were entered and analyzed in the SPSS software, version-26. Frequency/percentage was computed for demographic characteristics, and the Chi-square test of association was applied to check the relationship of demographic characteristics with students' knowledge.

RESULTS

According to table 1, Study results showed that 41.8% of participants were males and 58.2% were females. The majority of the participants, 62.7%, were between 20-30 years of age and had an experience of 5-10 years. 62.7% of participants have taken the vaccine against the Hepatitis B virus. Around half (53.7%) of the participants were exposed to needle stick injuries (NSI) during clinical rotations.

Table 1: Demographic Features of Studied Group

Demographic Features	Frequency (%)
Gender	
Male	28(41.8)
Female	39(58.2)
Age	
20-30 years	42(62.7)
31-40 years	23(34.3)
Above 40 years	2(3)
Work Experience	
0.6 yr-2 years	19(28.4)
2-5 years	13(19.3)
5-10 years	32(47.8)
Above10 years	3(4.5)

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Workplace	
ER	11(16.4)
ICU	12(17.9)
CCU	3(4.5)
General ward	28(41.8)
OT	1(1.5)
Other departments	12(17.9)
Vaccination status	
Vaccinated against Hepatitis B	42(62.7)
Not Vaccinated	25(37.3)
Incidence of NSI	
Yes	36(53.7)
No	31(46.3)

Table 2 results revealed that (59.7%) of students had a low score of knowledge, (17.9%) had moderate, and (22.4%) had a high score of knowledge regarding NSI. Overall, the nursing students had a low level of knowledge of NSI.

Table 2: Nursing student's knowledge of NSI

Nursing student's knowledge level of NSI		
Low level of knowledge	**Moderate level of knowledge**	**High level of knowledge**
59.7%	17.9%	22.4%

Table 3 results showed an association of the knowledge level of nursing students with their work experience*, but there was no association of knowledge level with other demographic characteristics of the students like gender, age, vaccination status, workplace, and incidence of NSI.

Table 3: Association between Demographic Features and knowledge score of Nursing students

Association between Demographic Features and knowledge score of Nursing Students n = 67				
Demographic Characteristics	**Knowledge Level of NSI**			**p-value**
	Low level n (%)	**Moderate n (%)**	**High Level n (%)**	
Gender				
Male	16 (57.1)	5 (17.9)	7 (25)	0.94
Female	24 (61.5)	7 (17.9)	8 (20.6)	
Age				
20-30 years	24 (57.10)	8 (19.1)	10 (23.8%)	0.831
31-40 years	14 (60.9)	4 (17.4)	5 (21.7)	
41-50 years	2 (100)	0	0	
Work Experience				
6 months to 2 year	15 (78.9)	4 (21.1)	0	0.006 *
2-5 years	6 (46.2)	2 (15.3)	5 (38.5)	
6-10 years	19 (59.4)	6 (18.7)	7 (21.9)	
>10 years	0	0	3 (100)	
Workplace				
ER	6 (54.5)	2 (18.2)	3 (27.3)	0.472
ICU	6 (50)	3 (25)	3 (25)	
CCU	1 (33.3)	2 (66.7)	0	
General ward	18 (64.2)	5 (17.9)	5 (17.9)	
OT	1 (100)	0	0	
Other departments	8 (6 6.7)	0	4 (33.3)	
Vaccination Status				
Vaccinated against HBV	28 (66.6)	7 (16.7)	7 (16.7)	0.301s
Not Vaccinated	12 (48)	5 (20)	8 (32)	
Incidence of NSI				
Yes	19 (52.8)	8 (22.2)	9 (25)	0.462
No	21 (67.7)	4 (12.9)	6 (19.4)	

DISCUSSION

NSIs are occupational health hazards for all professionals, including nursing students, who are at higher risk due to their lack of knowledge and experience. These injuries can lead to diseases such as Hepatitis B, Hepatitis C, and Human Immunodeficiency Virus if the needles are previously used on infected patients. Therefore, this descriptive cross-sectional study aimed to identify nursing students' knowledge and exposure to NSI. The result showed that 57.3% of nursing students who were in the second semester of Post RN BSN had experienced NSI, which is higher than the result of an analytical study conducted by Mengistu *et al.*, which showed 45.3% incidence of NSI and the result of another meta-analysis, in China, which showed 33% exposure to NSI among nursing students [15]. The prevalence rate of NSI in developing countries, like Pakistan, is higher than the developed countries, like Saudi Arabia, which showed a result of 14.7% exposure to NSI among nursing students [16]. The current study showed a 53.7% incidence of NSI which contrasts with a survey conducted in 2022 in India titled, "Needle stick and sharps' injury in health care students: Prevalence knowledge, attitude, and practice" which showed 25.2% incidence of NSI among health care students [17]. The current study was similar to a " Needle Stick and Sharp Injuries Among Nursing Students in Nanjing China" conducted in China by Zhang *et al.*,, which showed 60.3% reporting of NSI among nursing students [18]. The occurrence of NSI among nursing students was 14.7% in another study which contrasts with the current study, which showed a 53.7% incidence of NSI [19]. The present study was different from a study conducted in Italy by Papadopoli *et al.*, titled "Sharps and Needle Stick Injuries among Medical Residents and Health Care, Professional Students: Pattern and Reporting in Italy - a cross-sectional analytical study," which showed that 14.8% health care professional students sustained NSI [20]. The present study results were similar to a study conducted in Ethiopia in 2018, which showed that 65% of participants were male, 48.1% had 4-10 years of experience the overall prevalence of NSI was 43% [21]. In the present study, results showed that female participants (53.3%) were more knowledgeable than males (46.7%), the incidence of NSI was 53.7%, participants working inwards were 41.8%, in ICU 17.9% and E/R 16.5%, the results showed resemblance to a study by Sonkar *et al.*, in which female participants were more knowledgeable (59.6%) than males (40.4%), the incidence of NSI was 53.8%. Participants working inwards were 58%, E/R 38%, and ICU 7.7% [22]. The present study's results revealed that 22.4% had a high level of knowledge regarding NSIs, 17.9% moderate, and 59.7% had a low level of knowledge. The findings are different from a study by Sudha and Selvanayaki titled, " A Study to assess the

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knowledge of first-year nursing students on needle stick injury at selected colleges of Puducherry," which showed 82.2% of nursing students had decreased knowledge of 16.82% average, and 0.3% of students had a high level of knowledge regarding NSI [23]. The present study showed an association between the knowledge level of nursing students with their clinical experience (p-value 0.006), but no association was found with other demographic characteristics. The results differed from a study conducted in Iran, titled " Evaluation of needle stick injuries among nurses of Khanevadeh Hospital in Tehran" in which there was no association of knowledge level found with clinical experience. Still, knowledge level was associated with other demographic characteristics like gender and working hours [24]. The present study showed that 62.7% were vaccinated against the Hepatitis B virus, which is near to the study's results of India which showed a vaccination status of 55.6% [25]. The literature review revealed that most studies were conducted on exposure to NSI among healthcare workers (HCWs) and nursing students who remained ignored and who were more vulnerable to NSI than other HCWs due to inadequate knowledge and experience; therefore, this study was specially designed for nursing students. Overall, the study guided us that the number of NSI can be reduced by educational training programs, workshops, and adding some chapters in the curriculum to increase the knowledge level of student nurses regarding NSI.

CONCLUSIONS

The results showed a high prevalence of NSI, a low level of knowledge of NSI among student nurses, and a low immunization rate of the Hepatitis B vaccine. So, it is suggested that an educational training program should be conducted at institutes and hospitals to improve knowledge of student nurses regarding NSIs and an immunization drive to prevent them from the deadly virus.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Severity of Dental Abrasion and Its Association with Oral Hygiene Behaviors

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ABSTRACT

Dental abrasion (DA) is an erosive activity that wears away the surface of teeth. Due to the use of abrasive dentifrices and incorrect brushing techniques, it is a multifactorial phenomenon. **Objective:** To assess the severity of dental abrasion in association with oral hygiene behaviors. **Methods:** A total of 278 undergraduate students aged 18 to 25 years were enrolled in this study who were having abrasion of permanent dentitions. Mouth mirror and CPITN probe were used to detect abrasion on the labial surface of front teeth and conducted a questionnaire. The Smith and Knight's Tooth Wear Index was used to measure the severity and frequency of dental abrasion in the patients. SPSS version-22 was used to analyze the data. **Results:** From 278 participants, females were 163 (58.6%) and males were 115 (41.4%). Majority 132 (47.5%) were using medium type of brush, most of the cases 122 (43.9%) brushing twice a day. About 107 (38.5%) using brushing methods in combination, 137 (49.3%) were using brush for 1-2 minutes. Tooth sensitivity was reported in 133 (47.8%) of the cases. Out of all, DA was found in 160 (58%) of the cases. According to severity, minimum loss of surface characteristics was in 220 (79.1%). A highly significant association (p=<0.001) was found between the type of brush and dental abrasion. A non-significant association (p=0.816) was found between both frequency of brushing and dental abrasion. **Conclusions:** Brushing parameters did not affect abrasive lesions. Further study and long-term follow-up are required to distinguish oral hygiene routines from tooth abrasion.

INTRODUCTION

Attrition, erosion, and abrasion are the three types of tooth wear. Dental abrasion may happen anywhere, even between teeth, and is most often observed at the cervical necks of teeth, although it can also happen by using dental floss incorrectly or vigorously. While tooth-brush abrasion has long been believed to be the main cause of cervical abrasion, acid erosion has been linked to the beginning and progression of the cervical lesion. It is obvious that identifying the risk factors is crucial for changing any behaviors and offering the right guidance [1]. Clinical survey-based research has showed that dental abrasion is by far the most common etiological variable for the onset of non-cervical lesions (NCCL), and is most typically caused by improper tooth-brushing technique [2]. TSL (tooth surface loss) is a complicated damaging process. It is a term that mostly refers to non-carious TSL, which has no association with bacteria, and it is defined by non-carious loss of dental tissues around the cement-o-enamel junction, where enamel is thinnest [3]. There are many recorded causes of hard tooth structure loss; some could be reversible and others are irreversible. The TSL can influence tooth sensitivity, caries incidence, plaque

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retention, pulp vitality, structural integrity, and esthetic problems [4]. Aside from dental caries in the cervical region of the tooth, the variables responsible for tooth structure loss are complicated and have not been fully characterized [5]. Dental abrasion is one of the factors associated with TSL. It is the mechanical wear of the tooth structure caused by recurrent physical contact, primarily by abrasive dentifrices and/or toothbrushes [6]. It generally manifests as a wedge-shaped or V-shaped ditch on the cement-o-enamel junction of teeth and root surfaces [7]. Oral hygiene comprises the process of brushing one's teeth frequently (dental hygiene) and keeping one's mouth clean, disease-free, and free of other concerns (such as bad breath or halitosis) [8]. Regular oral hygiene is vital for preventing dental infection and halitosis. Brushing the teeth should take no more than 2 minutes and should be done twice day. Brushing the teeth too forcefully can cause dental sensitivity, receding gums, and loose teeth in the long run. Excessive pressure during teeth brushing, hard toothbrushes, abrasive toothpaste, and abrasive tooth powders are the most common causes of dental abrasion [9]. Other causes of dental abrasion include incorrect toothpick use, abrasive diets, and touching rough or hard dental surfaces, such as rough porcelain crowns. Dental abrasion has a complex etiology that occurs from the additive effects of several variables [10]. According to the literature, tooth brushing habit has a crucial impact in the development of TSL. The source of the increase in TSL occurrence is unknown; it could be owing to developments in restorative and preventative dentistry, or it could be due to improved awareness among dental and patient care professionals [11]. People can protect their teeth; however, this contributes to additional concerns, TSL being one of them. Patients who cleaned their teeth more frequently had higher rates of tooth surface loss than patients who brushed once a day. Abrasive TSL on the occlusal surface can also be caused by diet, chewing abrasive substances such as cigarettes, or frequent exposure to grit and dust [12]. Eating unwashed veggies that still contain trace amounts of soil may also be caused. Thread chewing, pipe smoking, and grasping hair pins in between the teeth can all produce abrasion on the tooth surface. Consuming dried sunflower seeds may cause abrasion sores [13]. It has been discovered that tooth surface loss becomes more common as one gets older. This is not surprising given that older patients, along with their teeth, are exposed to the key etiological variables for a longer length of time than younger patients, and so are expected to have higher tooth structure loss [14]. Furthermore, older people are more likely to have gingival recession as well as bone loss, which increases the susceptibility of the cementum and root surfaces, putting them at a higher risk of tooth surface loss (TSL) [15]. Tooth brushing is much more common in current times, which enhances the community's oral hygiene conditions while also making the harm inflicted more visible in severity and occurrence [16]. Early identification of tooth surface loss (TSL) is critical because tooth wear can result in dental hypersensitivity, loss of tooth shape and function, or even an underlying abscess. This study could be beneficial to arrange the awareness programs for the population to teach correct tooth brushing techniques and other oral hygiene behaviors to prevent this issue from becoming even worse and a burden on dental professionals and our society.

METHODS

This Cross-Sectional study with non-probability convenience sampling was conducted at Liaquat University of Medical and Health Sciences, Jamshoro. Study participants were students of BDS, MBBS, Bachelor in Nursing and Doctorate in Physiotherapy. The sample size was calculated by using the Open Epi online calculator and it was set as 278 in total. This study was conducted for six months after approval of synopsis from 12-12-2018 to 15-7-2019. Patients of either gender having age range of 18-25 years and permanent dentition with presence of dental abrasion were included in the study. Whereas, partially dentulous (anterior teeth) having restored or carious tooth surface, developmental anomalies or syndromes associated to dental hard tissues, class V restoration done on the buccal surface, patients wearing orthodontic braces were excluded from study. All the students fulfilling inclusion criteria were selected in the study. All the students were examined clinically using mouth mirror and probe in day light. A questionnaire was completed and a single examiner recorded abrasion on the buccal surface of teeth. The participants underwent an assessment to determine the frequency and severity of dental abrasion, utilizing the tooth wear index (TWI) developed by Smith and Knight [13]. Data were analyzed using statistical package for social sciences (SPSS)version 22.0 for windows. Frequencies and percentages of categorical variables like gender, course, year of study, types of brush, frequency of tooth brushing, methods of tooth brushing, cleaning agents, use of tooth picks, teeth sensitivity, pan Chaila chewing, biting hard objects, tooth abrasion were generated. The mean and standard deviation of continuous variables like age were computed. Chi-square test was used to test association between categorical variables like tooth abrasion and gender and (types of brush, frequency of tooth brushing, methods of tooth brushing). The level of significance was considered as ≤ 0.05.

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RESULTS

A total 278 participants were included in the study, among them females were 163 (58.6%) and males were 115 (41.4%). Most of the participants were from rural areas 148 (53.2%) and 130 (46.8%) belongs to urban areas. Cumulatively while incorporating all undergraduates' programs related to selected disciplines, the 130 (46.8%) of the study participants were studying in 2nd year, 48 (17.3%) were in first year, 50 (18%) in fourth year, 34 (12.2%) were in final year and 16 (5.8%) were in third year. In term of discipline the ration of participants from MBBS was 73 (26.3%), BDS 81 (29.1%), Nursing 84 (30.2%) and physiotherapy 40 (14.4%) shown in Table 1.

Table 1: Distribution of study participants on the basis of Demographics

Variables	Frequency (%)
Gender	
Male	115(41.4)
Female	163(58.6)
Residence	
Urban	130(46.8)
Rural	148(53.25)
Year of Education	
1st Year	48(17.3)
2nd Year	130(46.85)
3rd Year	16(5.8)
4th Year	50(18)
Final Year	34(12.25)
Discipline	
MBBS	73(26.25)
BDS	81(29.1)
Nursing	84(30.2)
Physiotherapy	40(14.4)

According to brush types, 132 (47.5%) using medium type of brush, 125 (45%) using soft type and 21 (7.6%) using hard type brush. Most of the cases 122 (43.9%) brushing twice a day, 109 (39.2%) brushing once a day, 27 (9.7%) occasionally using brushing, 15 (5.4%) not brushing continuously and only 5 (1.8%) cases brushing thrice a day. According to methods of brushing, 61 (21.9%) using brushing horizontally, 26 (9.4%) using vertically, 84 (30.2%) brushing circular and 107 (38.5%) using brushing methods in combination. Majority of the participants 137 (49.3%) were using brush for 1-2 minutes, followed by 100 (36%) for more than 2 minutes, and 41 (14.7%) for only one minute. Tooth sensitivity was reported in 133 (47.8%) of the cases, while 118 (42.4%) had not any sensitivity and 27 (9.7%) do not know regarding it shown in Table 2.

Table 2: Distribution of study participants on the basis of Oral Hygiene Behaviors

Variables	Frequency (%)
Brush Type	
Soft	125(45)
Medium	132(47.5)
Hard	21(7.5)
Frequency of Brushing	
No Brushing	15(5.4)
Occasionally	27(9.7)
Once a day	109(39.2)
Twice a day	122(43.9)
Thrice a day	5(1.8)
Method of Brushing	
Horizontal	61(21.9)
Vertical	26(9.4)
Circular	84(30.2)
Combination	107(38.5)
Duration of Brushing	
1 minute	41(14.7)
1-2 minutes	137(49.3)
More than 2 minutes	100(36)
Teeth Sensitivity	
Present	133(47.8)
Absent	118(42.4)
Don't Know	27(9.7)

Out of all, dental abrasion was found in 160 (58%) of the cases while 118 (42%) of the cases reported no dental abrasion shown in Figure 1.

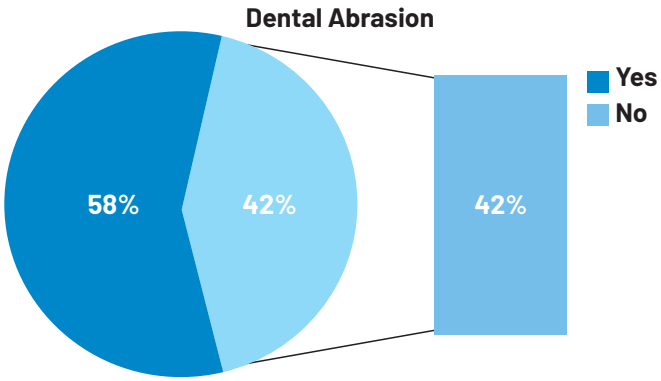

Figure 1: Distribution of Study Participants According to Dental Abrasion (n=278)

According to severity, minimum loss of surface characteristics was in 220 (79.1%) and loss of enamel exposing dentin for < 1/3 of surface was seen in 58 (20.9%) of the cases shown in Figure 2.

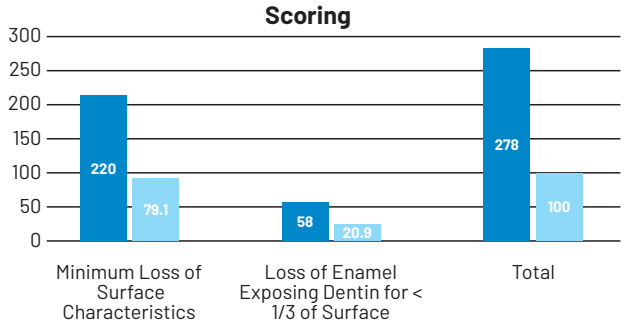

Figure 2: Distribution of Study Participants According to its Severity (n=278)

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A non-significant association (p=0.432) was found between both genders, frequency of brushing, methods of brushing and brushing time with dental abrasion. While a highly significant association (p=<0.001) was found between the type of brush (soft, medium and hard) and dental abrasion shown in Table 3.

Table 3: Association of study variables with Dental Abrasion

Variables		Dental abrasion		p-value
		Yes	No	
Brush type	Soft	46 (16.50%)	79 (28.40%)	<0.001*
	Medium	100 (36.00%)	32 (11.50%)	
	Hard	14 (5.00%)	7 (2.50%)	
Frequency of Brushing	No brushing	8 (2.90%)	7 (2.50%)	0.816
	Occasionally	16 (5.80%)	11 (4.00%)	
	Once a day	60 (21.60%)	49 (17.60%)	
	Twice a day	72 (25.90%)	50 (18.00%)	
	Thrice a day	4 (1.40%)	1 (0.40%)	
Method of Brushing	Horizontal	35 (12.60%)	26 (9.40%)	0.735
	Vertical	17 (6.10%)	9 (3.20%)	
	Circular	45 (16.20%)	39 (14.00%)	
	Combination	63 (22.70%)	44 (15.80%)	
Brushing Time	1 Minute	25 (9.00%)	16 (5.80%)	0.891
	1-2 Minute	78 (28.10%)	59 (21.20%)	
	More than 2 Minutes	57 (20.50%)	43 (15.50%)	

DISCUSSION

The study was performed on 278 participants and among them 58.6 was females and 41.4% were males. Most of the participants were from rural areas 53.2%, medium type of brush was most prevalent 47.5%, brushing twice a day's frequency of brushing was reported in majority 43.9%, around 38% of the participants used combined method of brushing (circular, vertical and horizontal) and majority 49.3% were doing tooth brushing for 1-2 minutes. Those who brushed more often had greater wear rates than patients who brushed once a day, as shown by study conducted by Sangnes and Gjermo [17]. This might be due to abrasives in the tooth paste, extended brushing time, or poor brushing technique. The etiology of cervical abrasion is essentially multifactorial and is a mix of numerous kinds of wear variables that are connected, such as age, diet, gingival recession, periodontal health, dentifrice, speed, and pressure utilized when brushing. This is consistent with the incidence of cervical abrasion reported by Sud, which was 13%, as well as Sexena *et al.*, (68.6%) and Borcic *et al.*, (60-70%), which were both higher than the present research [18- 20]. David and Bhat reported 6.1%, which is lower than the current investigation rate [21]. While investigating the etiologies of tooth surface loss, research in Romania discovered that abrasion (55.7%) affects the natural dentition more often than the other etiologies related with non-cervical tooth surface loss [22]. The variation observed in research findings could potentially be ascribed to dissimilarities in sample size and methodology. The study did not investigate the potential interaction between non-carious cervical lesions and other degrading processes such as tooth erosion and abfraction, as these lesions are known to arise from factors beyond abrasive phenomena. Furthermore, a review of the literature reveals that the pathogenesis of non-carious cervical lesions is multifactorial, which may also be responsible for the present investigation's low frequency rate [23, 24]. The Smith and Knight Index of tooth surface loss was used in the present investigation to assess the grade 2 abrasive severity score in the sample group. Similar to the results of the present study, Mushtaq and Ahmed found a mean tooth wear index of 1.70 ± 1.22 for the right mandibular lateral incisor [25]. In addition, our research discovered a negligible correlation between characteristics related to tooth brushing behaviour and abrasive cervical lesions. Comparable cross-sectional research looking at tooth surface loss in connection to dental care and soft drink intake among adults was done in Karachi [26]. One-day tooth brushing by females resulted in localized tooth surface loss of 55.0% and generalized tooth surface loss of 60%. 70.4% of those who brush their teeth for a minute reported anterior tooth surface loss of 70.4% 66.7% of men reported tooth surface loss. The comparison study's output contradicts the present one. Dissimilarities in outputs might be attributed to soft drink intake, which was not measured in the current study. The favorable results of the comparative research may have been influenced by elderly participants, while the present study only comprises participants from a small age range who received less stimulus overall. An Indian study by Bhardwaj on the relationship between hard tissue abrasion and teeth brushing practices among Shimla inhabitants was conducted [27]. Similar to our results, the study discovered no significant association between dental abrasions and variables such tooth brush type and brushing technique. In contrast to the current conclusion, a significant relationship was discovered between frequency of dental brushing and abrasive lesions. This might be because the bulk of the sample group only brushes their teeth once a day for one minute. Brushes are classified as soft (0.2 mm), medium (0.3 mm), or hard based on the diameter of the bristles (0.4 mm). However, in this case, the force employed may have an additional consequence. The above-mentioned findings have been described in research exercises by Borcic *et al.*, and Yadav *et al.*, [20, 28]. Our research indicated no significant connection, which may be because the majority of the sample population used a medium tooth brush, while Mushtaq and Ahmed discovered a significant link between participants using various kinds of tooth brushes and hard tissue abrasive lesions (p=0.05)

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[25]. Additionally, the force used to brush one's teeth was not measured in the current study, despite the fact that this is a significant factor in the development of cervical lesions. The present research relied only on feedback from study participants about brushing procedures and toothbrush use, which may result in an insignificant connection between dental brushing parameters and non-carious cervical abrasive lesions. Furthermore, due to intrinsic methodological constraints and inconsistent findings, a review of evidence-based literature does not identify any tooth brushing element as the basic etiology behind the cervical lesions [29].

CONCLUSIONS

Within the constraints of the present study, it gives baseline information on abrasive cervical lesions in undergraduate population of medical university. Second, there was no discernible link between the frequency of abrasive lesions and tooth cleaning parameters. However, further research and long-term follow-up are needed in the future to separate characteristics associated to oral hygiene practices and the occurrence of tooth abrasion.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Frequency of Development of Atrial Fibrillation After Coronary Artery Bypass Grafting in Different Age Groups

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ABSTRACT

Atrial fibrillation is a known complication in patients having coronary artery bypass grafting (CABG) surgery with a Post- up to 32% after CABG reported incidence up to 32%. **Objective:** To determine the frequency of development of atrial fibrillation after coronary artery bypass grafting surgery in different age groups. **Methods:** This was an observational prospective cross sectional study, conducted at department of cardiac surgery Dr Ruth.K.M.Pfau Civil Hospital Karachi. The sample size of 199 was calculated. All patients between the ages of 30-70years. Irrespective of gender, refer for CABG surgery was included in the study. Two groups were made on the basis of their age, group 1, 30-50 years and group 2, 51-70 years. Those patients who came for CABG along with valve replacement and or other concomitant surgery were not included in my study. **Results:** After data collection through Performa data analyzed on SPSS 17.0. As per results 20.1% individuals in the study developed atrial fibrillation. Male to female ratio was 3: 1. In Group 1, 16.6% patients developed Atrial Fibrillation and in group 2 21.58% developed Atrial Fibrillation with p value of 0.85. Hypertension was a commonest co-morbid and present in 56.2% patients in this study. **Conclusion:** The study concluded that the frequency of development of atrial fibrillation after CABG as 20.10 %. Patients with positive family history of coronary artery diseases and smokers have significantly higher risk to develop atrial fibrillation after surgery.

INTRODUCTION

Postoperative Atrial fibrillation is a common problem after cardiac surgery with cardiopulmonary bypass [1]. It is linked with increased morbidity, including high chances of Cerebero-vascular accidents, prolonged duration of hospitalization and increased financial burden [2]. Numerous researchers have investigated the potential risk factors for development of postoperative atrial fibrillation. They found advanced age and preoperative withdrawal of beta-blockers are the most common risk factors [3]. If patients risk factors of atrial dysrhythmias after CABG could be identified preoperatively, the prophylactic efforts would be more focused. Incidence of Atrial Fibrillation is still very high in spite of prophylactic use of magnesium, beta blocker and replacement of electrolyte measures. With the improvement of postoperative care, the mortality and morbidity in patients with AF after CABG has declined in recent years. Although there is a general decline in complications the incidence of postoperative AF has not decreased and actually appears to be increasing [4]. Pathophysiologically, the electrical impulses generated in the upper chambers of the heart in an organized rhythm are converted into rapid disorganized patterns. It is considered

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that during aortic cross clamp, the blood supply to atrial tissue is compromised resulting in increase in the sympathetic supply and prolonged inflammatory response, that may play a critical role in the occurrence of Atrial fibrillation after CABG [5, 6]. In most of the cases, AF subsides after CABG surgery without any medication. However, even though AF is not associated with complications, its management needs further medical and nursing time and their hospital stay is usually extended [7]. Patients with recurrent atrial fibrillation had longer hospital stays and experienced greater infectious, renal and neurologic complications than those with single episodes [8]. Published literature has quoted the frequency of development of postoperative AF as high as 32% [9]. This is a fairly high frequency of any complication to be developed after CABG surgery. Another research shows the frequency of development of AF after CABG as low as 12.3%. One local study also showed frequency of atrial fibrillation 15.2% after CABG [10]. As the literature is not clear about the frequency, the present study is undertaken to fill the gap in literature and access post-operative atrial fibrillation after coronary artery bypass grafting surgery in our population. That's why this study aimed to determine the frequency of development of atrial fibrillation after coronary artery bypass grafting surgery in different age groups.

METHODS

The Study Design was Observational Prospective Cross Sectional study conducted at Department of Cardiac Surgery, Dr. Ruth K. M. Pfau Civil Hospital Karachi from January 2018 to January 2019. Through open EPI sample size was calculated and considering 15.2% proportion of atrial fibrillation as seen literature and margin of error 8%, confidence interval 95% sample size came out to be 199 patients. Patients with age of 30 to 70 years, either male or female and of any ethnic group who have recently undergone isolated coronary artery bypass grafting surgery with normal serum potassium levels (4.5-5.5mEq/L)were included in this study and patients with chronic atrial fibrillation or atrial flutter before surgery, Redo CABG,CABG with ischemic Mitral Regurgitation, CABG with Ventricular Septal rupture repair, Critical conducting disturbance preoperatively, Intraoperative death during hospital stay were excluded. Data collected through Non probability, consecutive sampling method using a Performa. Approval from the institutional ethical review committee and synopsis approval from DUHS has been taken. We included all patients meeting the inclusion criteria. Admitted patients enrolled from the cardiac surgery after formal written informed consent both in English and Urdu languages obtained preoperatively from the patients. They were subsequently underwent coronary artery bypass grafting surgery. After surgery, patients were followed for four days for final outcome. The data along with demographic variables (age, gender, ethnic group)has been collected from the patients and mentioned in Performa. Risk factors included in Performa i.e. diabetes, HTN and smoking. Routine investigation, complete blood picture, BUN, Creatinine, electrolyte will be sent before and after surgery. Patients were observed postoperatively in the ICU for four days from the day of surgery as per standard protocol. Patients were categorized into two different groups based on their age, first group included patient's age between 30-50years, second group included age between 51-70 years. Collected data were entered and analyzed in SPSS version 17.0. Age was analyzed in mean ± SD. Gender and presence of atrial fibrillation were analyzed in proportions and percentages. Tabular and graphical representation of results was done. Data were stratified in age and gender variables. Post stratification chi square test was applied. *P* value $\leq$ 0.05 was taken as significant".

RESULTS

There were one hundred and ninety-nine patients underwent coronary artery bypass grafting surgery with normal serum potassium levels (4.5-5.5mEq/L) were included in this study. Patients were categorized into two different groups based on their age, first group (included patients age between 30-50 years) 30.15%, second group (included age between 51-70 years) 69.85% patients participated in this study. Out of 199 patients, 150(75.376%) were male and 49(24.623%) were female. Out 199 patients 76 (38.19%) were with EF more than 50%, 63 (31.7%) were with EF between 30-50% and less than 30 % EF were present in 60 (30.15%) patients. AF found more (31.5%) in patients with good EF as presented in Figure 1.

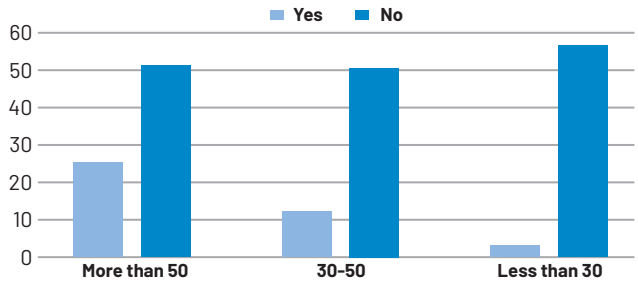

Figure 1: Frequency of Atrial Fibrillation with respect to Ejection Fraction

Regarding co-morbidity, Hypertension was the commonest co-morbid that was observed in 56.2% cases, followed by diabetes mellitus 53.2%, Smoker 36.6% and family history of CAD was 26.6% as presented in Table 1.

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Table 1: Comorbidity status of the patients (n=199)

Co-morbidity	Frequency
Diabetes Mellitus	106 (53.2%)
Hypertension	112 (56.2%)
Smoker	73 (36.6%)
Family History of CAD	53 (26.6%)

Frequency of atrial fibrillation after coronary artery bypass grafting surgery was observed in 20.10% (40/199) patients as shown in Figure 2.

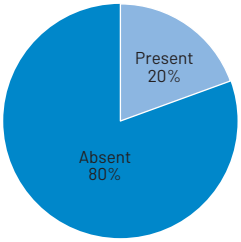

Figure 2: Frequency of development of Post-CABG Atrial Fibrillation

Frequency of development of post CABG atrial fibrillation in group 1 patients was 16.66 %(10/60) and in group 2 was 21.58% (30/139) (Chi-Square= 0.32; p=0.85) in Table No. 2. Similarly Frequency of development of post CABG atrial fibrillation was also not significant between male and female (Chi-Square = 1.2; p=0.27) in Table 2. With respect to co-morbidity, rate of development of post CABG atrial fibrillation was significantly high in smokers and those having positive family history. Hypertension, diabetes mellitus and dyslipidemia has been found statistically non-significant.

Table 2: Development of post CABG atrial fibrillation with respect to age & gender

Group	Atrial Fibrillation		Total	p-Value
	Present (N=40)	Absent (N=159)		
Age (Years)				
30 to 50 Years	10(16.66%)	50(83.33%)	60	0.85
51 to 70 Years	30(21.58%)	109(78.41%)	139	
Gender				
Male	33(22%)	117(78%)	150	0.27
Female	7(14.2%)	42(85.7%)	49	

DISCUSSION

After CABG surgery "20% to 40% of patients developed Atrial Fibrillation (AF) [10-12]. In spite of advancements in anesthetic and surgical techniques, no change has been noticed in the incidence of Arrhythmias in majority of cases post CABG Atrial fibrillation is self-limiting [10]. Despite general decline in complications due to advances in surgery, there is no reduction seen in the development of postoperative atrial fibrillation. The incidence of AF is increasing because of the increasing age of patients underwent CABG [10, 12]. Although it is considered a benign complication but it may result in higher morbidity including hypertension, palpitations, pain, fatigue, dyspnea, or generalized anxiety. Post CABG Atrial fibrillation has a well-known association with congestive heart failure, renal impairment, prolonged ventilation, readmission to the intensive care unit, and manifolds increased risk of early postoperative stroke [10, 12]. Research also shown that post CABG Atrial fibrillation increases cost of treatment [11-13]. The increase rate of hospital readmission after discharge has been seen in Post CABG Atrial fibrillation [14]. The risk of developing AF is more in elderly population after CABG [15, 16]. This seems to be due to fibrosis of Atrial muscle, its dilatation,[17] and loss of conduction between inter-conducting fibers [18]. Which leads to decreased conduction rate and increased chances of developing arrhythmias. After CABG surgery there will be tissue remodeling in cardiac tissue that leads to fibrosis and scaring which increases the risk of development of AF. Advanced age is an independent risk factor in development of post-operative AF as shown in one of the study [12]. Increased in atrial connective tissue is one of the factors for the development of AF at the age of eighty years as shown by Mathew et al. [10, 19]. Some studies also shown age is not an independent factor, [20, 21] for the development of AF. Although in elderly patients, its incidence is high which is concordant to Spodick DH et al study [21]. In our study most of the patient belong to group 2 (51-70 years). Several researchers have found an increased incidence among males, [10-12, 22] whereas others have reported no difference [23, 24]. Data derived from a research conducted by M Golmohammadi1 et al in Iran from 2006- 2008 [25] and Auer et al. [21] did not support that male patients have more incidence of AF. In our study, Out of 199 patients, 75.37% were male and 24.63% were female, we did not find any difference on univariate analysis, but on multivariate analysis male gender was the only factor for development of AF after CABG. In our study, Hypertension was the commonest co-morbidity in 56.2% cases, but the incidence of AF did not reach to significant level. Although, the study of Ananke and colleagues [11] demonstrates that hypertension is the predictor of AF in the post CABG population. In our study, frequency of development of post CABG Atrial fibrillation was observed in 20.10% (40/199), while a similar study by M Golmohammadi et al [25] concluded that 12.3% of patients developed post CABG AF which is much less than our study. This could be due to difference in study design, population and criteria of assessment of AF in post CABG patients.

CONCLUSIONS

We concluded in this study that the frequency of development of Atrial Fibrillation after CABG was found to be 20.10 %. Patients with positive family history of

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coronary artery diseases and smokers have significantly higher risk to develop Atrial Fibrillation after surgery". Patients with age more than 50 years have the higher risk to develop Atrial fibrillation (15%) but not significant. High blood pressure and diabetes mellitus also have high risk for AF but not reached significant values.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Impact of Breast Feeding On Diarrhea and Pneumonia Among Vaccinated Children: Single Center Study

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ABSTRACT

The best way to give babies the nutrition they need to grow and develop is through breast milk. **Objective:** To assess the combine effect of breast feeding, Rota virus vaccine and Pneumococcal vaccine on frequency of Diarrhea and Pneumonia in children less than 5 years of age. **Method**s: A descriptive cross-sectional study conducted at Department of Pediatrics at Darul sehat hospital, Karachi. Participants were selected by convenience sampling and interview-based questionnaire was used. 196 Participants were interviewed which included mothers of infant and children from 6 months to 5 years of age, who received complete or partial vaccination according to Expanded program of Immunization (EPI) schedule with information on history of diarrhea and pneumonia. Infant and children with bloody diarrhea were excluded. **Results:** Among the 196 participants, 152 (77.6%) children received breast feed,72(47.4%) children received two doses of Rota vaccine and 128 (84.2%) children received three doses of Pneumococcal vaccines. Significant impact was seen with breast feeding and Rota vaccine on the frequency of diarrhea with p value of 0.0001. Breastfeeding and the pneumococcal vaccine both had a similar potent effect on the prevalence of pneumonia, with a p-value of 0.006. **Conclusions:** Our study highlights the importance of breast feeding in vaccinated children, with incidence of diarrhea in breastfed, vaccinated children decreased to (32%), compared to 93% in non-breastfed, unvaccinated infants. Similarly, only 33% of breastfed, vaccinated children developed pneumonia, compared to 85% of unvaccinated, non-breastfed infants.

INTRODUCTION

The best way to give babies the nutrition they need to grow and develop is through breast milk. It has been associated with lower incidence of illnesses such diarrhea and respiratory tract infections, which reduce hospitalization and mortality [1]. Its significance is widely acknowledged in middle- and low-income countries [2]. Every year, 8% of deaths in children under the age of five are caused by diarrhea. Due to severe gastroenteritis and rapid dehydration, rotavirus, one of the leading causes of diarrhea in children, can be fatal [3]. Breastfeeding may lower the risk of diarrhea, according to several studies [4-7]. There is a higher risk of morbidity from diarrhea in children who were not exclusively breastfed for the first six months of life and who have not received the Rota virus vaccine. Rotavirus vaccination is crucial for children since study reveal that breastfeeding alone is insufficient to prevent diarrhea caused by the rotavirus [8]. More over half of pneumonia-related deaths worldwide are caused by streptococcus pneumonia [9]. After the Pneumococcal Conjugate Vaccine (PCV) was added to the vaccination schedule to lower pneumococcal associated morbidity and mortality, there was a notable decrease in hospitalizations [10]. The fatality rates caused by pneumonia are highest in developing and underdeveloped nations. Low- and middle-

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income countries have been described as frequently experiencing issues such inadequate breastfeeding, overcrowding, poor nutrition, low socioeconomic status, and insufficient immunization [11]. The objective of this study was to determine how breastfeeding affected the incidence of diarrhea and pneumonia in children who had received the Pneumococcal and Rotavirus vaccines. To the best of our knowledge, there hasn't been a local study that has evaluated the combined impact of breastfeeding and immunization on the frequency of diarrhea and pneumonia in children under the age of five.

METHODS

From 1st October 2019 till 31st December 2019, a cross-sectional survey was carried out at the Darul Sehat hospital in Karachi's pediatrics department. The Raosoft® sample size software was used to determine the sample size. In Pakistan, it is believed that 40% of children exclusively breastfeed [12]. An estimated sample of 196 patients was gathered for the study by taking into account the 95% confidence interval (CI), 5% margin of error, and 80% power to detect such difference. Data were stored and analyzed using IBM-SPSS version 23.0. Counts with percentages were reported on Age group, sex, name of vaccine received, breastfeeding status and reason of not breastfeeding for studied children. Pearson Chi-square test was used to check the association of breastfeeding with vaccinations done, reason of vaccination and reason of no vaccination. Binary logistic regression was performed to build two models for estimating risk of Pneumonia Model-I and Diarrhea Model-II and impact of breast feeding, rota and pneumococcal vaccination, reason of vaccination and reason of not vaccination was studied using odds ratio with 95% confidence interval. P-value less than 0.05 were considered statistically significant, bar diagram and odds ratio charts were also used to give graphical presentation of data. Convenience sampling was used to choose the respondents, and an interview-based questionnaire was filled out. The subjects were children from the outpatient department who accompanied their mother and other family members for medical advice regarding any illness. Infants and children aged 6 months to 5 years old who had completed or partially completed the Expanded Program of Immunization (EPI) schedule and provided information on previous episodes of pneumonia and diarrhea were included as participants. Diarrhea is defined as child having more than 3 episodes of stool per day [13]. Children and infants who had bloody diarrhea were excluded. Pneumonia is categorized as child with cough and fast breathing requiring treatment and no pneumonia is defined as cough and flu according to IMNCI [14]. After receiving all necessary information, parents provided their signed consent. Ethical approval was sought from the ethical review committee of our institution.

RESULTS

In the present study there were one hundred and ninety-six children with a mean age of 25 (SD = ± 18.3) months, 89 (45.4%) received Pneumonia vaccine, 3 (1.5%) received Rota vaccine, 82 (41.8%) received both Pneumonia and Rota vaccine and 22 (11.2%) were unvaccinated. 152 (77.6%) children received breastfeed. Table 1 shows the association of breastfeeding with studied factors. Rota vaccination and grades of diarrhea showed significant association with breastfeeding, ($p<0.05$).

Table 1: Association of Breastfeeding with Studied Variables

Characteristics		Breast feeding				p-value
		No (n=44)		Yes (n=152)		
		n	%	n	%	
Age Groups	≤6 Months	9	20.5	28	18.4	0.52
	7 - 12 Months	5	11.4	26	17.1	
	13 - 24 Months	7	15.9	37	24.3	
	25 - 48 Months	16	36.4	45	29.6	
	49 - 60 Months	7	15.9	16	10.5	
Sex	Boy	21	47.7	81	53.3	0.51
	Girl	23	52.3	71	46.7	
Categories of Rota vaccine	Partial	4	9.1	5	3.3	<0.01*
	Complete	9	20.5	72	47.4	
	None	31	70.5	75	49.3	
Categories of Pneumonia vaccine	Partial	7	15.9	13	8.6	0.12
	Complete	31	70.5	128	84.2	
	None	6	13.6	11	7.2	
Grading of Pneumonia	Pneumonia	18	40.9	55	36.2	0.56
	No pneumonia	26	59.1	97	63.8	
Grading of diarrhea	Diarrhea	35	79.5	77	50.7	<0.01*
	No diarrhea	9	20.5	75	49.3	
*p<0.05 was considered statistically significant using Pearson Chi-square test						

Pneumococcal vaccine, frequency of pneumonia, and breastfeeding were all found to be significantly correlated, with a p value of 0.006 as shown in Table 2.

Table 2: Association of Grading of Pneumonia with Breastfeeding and Pneumonia Vaccination

Breastfeed/ Pneumonia Vaccine	Grading of Pneumonia				p-value	Odds Ratio (95% C.I)
	No (n=44)		Yes (n=152)			
	n	%	n	%		
Breastfeed and Pneumonia Vaccinated	94	66.7	47	33.3	0.006*	**Reference**
Breastfeed and No Pneumonia Vaccinated	3	27.3	8	72.2		5.33* (1.35-21.0)
No Breastfeed and Pneumonia Vaccinated	25	65.8	13	34.2		1.04 (0.48-2.21)
No Breastfeed and No Pneumonia Vaccinated	1	16.7	5	83.3		9.99* (1.13-88.0)
*p<0.05 was considered statistically significant1						

Table 3 shows Rota vaccination, frequency of diarrhea, and breastfeeding were found to be significantly correlated, with a p value of <0.01.

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Table 3: Association of Grading of Diarrhea with Breastfeeding and Diarrhea Vaccination

Breastfeed/ Rota Vaccine	Grading of Diarrhea				p-value	Odds Ratio (95% C.I)
	No (n=84)		Yes (n=112)			
	n	%	n	%		
Breastfeed and Rota Vaccinated	52	67.5	25	32.5	<0.01*	Reference
Breastfeed and No Rota Vaccinated	23	30.7	52	69.3		4.70* (2.37-9.32)
No Breastfeed and Rota Vaccinated	7	53.8	6	46.2		1.78 (0.54-5.86)
No Breastfeed and No Rota Vaccinated	2	6.5	29	93.5		30.1* (6.66-136.5)
*p<0.05 was considered statistically significant using Pearson Chi-square test						

Table 4 shows the result from binary logistic regression analysis. Children who were not breastfed and unvaccinated have higher risk of developing pneumonia and diarrhea.

Table 4: Risk Estimation of Pneumonia and Diarrhea using Binary Logistic Regression

Risk Factors	Model -I Pneumonia OR (95% C.I)	Model-II Diarrhea OR (95% C.I)
No Breastfeeding	1.22(0.61-2.42)	3.78*(1.70-8.41)
Partially Vaccinated	0.30(0.07-1.27)	0.61(0.14-2.64)
Completely Vaccinated	0.14* (0.04-0.45)	0.13* (0.07-0.26)
Not Vaccinated	4.72* (1.42-15.6)	10.8* (1.39-85.0)
*odds ratio considered statistically significant with p<0.05 Model-I : Dependent variable Pneumonia Model-II : Dependent variable Diarrhea		

In Model-I for Pneumonia, partial vaccination lowers the odd of developing pneumonia by 70% (OR: 0.30 (CI: 0.07 - 1.27)) and complete vaccination lowers the odd of developing pneumonia by 86% (OR: 0.14 (C.I 0.04 – 0.45) when compared with unvaccinated children.On the contrary the children who did not breastfeed had 1.22 times higher risk of developing the disease (OR: 1.22[C.I. 0.61 - 2.42]),) while children who were unvaccinated had 4.72 times higher likelihood of having pneumonia (OR: 4.72 (C.I. 1.42 - 15.6)). While in model-II for diarrhea, complete vaccination lowers the odd of developing diarrhea by 87% (OR: 0.13 (CI:. 0.07 - 0.26) when compared with unvaccinated children. On the contrary children who were not breastfed had a 3.78 times greater likelihood of developing the diarrhea (OR: 3.78 (CI: 1.70 - 8.41)) and children who were unvaccinated had 10.8 times significantly higher risk of contracting diarrhea (OR: 10.8 (CI: 1.39 - 85.0)).

DISCUSSION

This study was conducted with the understanding that, despite being part of our tradition, our religion, and physician advice in accordance with WHO criteria, the practice of breastfeeding is still infrequent in our society. The preventive effect of breastfeeding cannot be underestimated in the presence of these vaccines, despite the fact that immunization against diseases like Rota virus diarrhea and pneumonia offer immunity against such illnesses, hence reducing the burden of disease globally [15]. According to a survey conducted by Unicef in Pakistan, 48.4% of children are exclusively breastfed, compared to 68.4% who continue to breastfeed until one year of age [16]. In our study, the prevalence of breastfeeding was 77.6%, which may be attributable to mothers in the study's catchment area having higher levels of education and awareness. Our research has demonstrated a favorable correlation between breast-fed infants who have received two doses of the Rota vaccination and a reduction in diarrheal episodes. This finding was reinforced by a study conducted in Ethiopia that revealed infants who had only one dose of the Rota vaccination experienced a three-fold rise in diarrhea incidents, while infants who were not breastfed experienced a two-fold increase [8]. Additionally, a Mozambique study revealed that children who received the Rota vaccination experienced fewer hospitalizations for diarrhoea [17]. However, a study conducted in the Kingdom of Saudi Arabia, where children have received the Rota vaccine as part of EPI, does not support the impact of Rota vaccine on diarrhoeal cases. But it was discovered that these infants were receiving mixed feeding [18]. The effectiveness of breastfeeding in preventing diarrheal illnesses is still up for debate. Indian research has demonstrated the protective effects of anti-Rota virus antibodies in mother milk, consequently decreasing the incidence of Rota virus diarrhea, [19] which is consistent with our study that breastfeeding has a significant impact on reducing the frequency of diarrhea. Additionally, study has shown that breastfeeding improves the effectiveness of vaccines. According to a meta-analysis comprising 17 articles, there is no connection between Rota virus gastroenteritis and breast-feeding. Although there are theoretical advantages to breastfeeding, in practice we need preventative measures like rotavirus immunization to prevent diarrhea [20]. Similarly Malaysian study also suggests that that breast feeding and Rota vaccination both can have beneficial effect against these viruses. The vaccination requires multiple dosing and time to produce its protective effects, during which beneficial and protective effect of breast-feeding help gives the immunity and hence magnifies the effect of vaccination [15]. These studies suggests that immune protective composition of breast feeding provides the early immune response to the infant which is enhanced by the protective effects of two doses of Rota vaccine given before 6 months of age, reducing the frequency of Rota associated diarrhea. In our study, a similar substantial correlation between breastfeeding, the frequency of pneumonia, and pneumococcal vaccination was observed,

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which contrasted with a study from India that found that out of 63 children with pneumonia, 48 (76.1%) were breastfed whereas 15 (23.8%) were not [21]. According to Lamberti *et al.*, systemic review of the literature, the absence of exclusive breastfeeding is the primary cause of the rise in morbidity from pneumonia and mortality from severe pneumonia in infants [22]. Similar findings were also reported from a study conducted in Brazil, which revealed a notable decrease in pneumonia-related hospitalizations among infants under 6 months of age who were exclusively breastfed and in children 9 to 12 months of age who were breastfed [23]. These studies demonstrate that breastfeeding exclusively has a better effect on boosting infants' immunity before the age of six months. Breastfed newborns at 4 months of age have been proven to have larger thymuses and higher antibody titers, producing a more potent immunological response than non-breastfed babies. According to a Kenyan study, babies who were breastfed had a 47% lower risk of having pneumonia [24]. Due to the pneumococcal vaccine's positive impact, the incidence of pneumonia has significantly decreased in our study. According to an Australian study, the pneumococcal vaccine offers higher protection and reduces the number of paediatric pneumonia hospitalization's [25]. Similar to the Gambian trial, after receiving the recommended dose of the pneumococcal vaccine, pneumonia cases significantly decreased by 22% [26]. Although breastfeeding offers immunity through anti-inflammatory, immunological modulatory, and antibacterial activity, adequate vaccination coverage and dosages considerably increase the benefit to battle the mortality and morbidity linked to pneumococcal disease. As far as we are aware, no study has been conducted to date to assess the combined impact of breastfeeding and the contribution of vaccinations to the prevention of diarrhea and pneumonia in children under the age of five. Our study is not without limitations. The study being of short duration and hence we could not assess the long-term effect. Our study represents a certain catchment area with middle class population so this cannot be a representation for overall population.

CONCLUSIONS

Our study highlights the importance of breast feeding in vaccinated children, with incidence of diarrhea in breastfed, vaccinated children decreased to 32%, compared to 93% in non-breastfed, unvaccinated infants. Similarly, only 33% of breastfed, vaccinated children developed pneumonia, compared to 85% of unvaccinated, non-breastfed infants. Effective measures should be undertaken to encourage breastfeeding, especially during the first six months of life. Effective parental education regarding the advantages of immunization and risks of not getting immunized is necessary.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Incidence and Predictors of Acute Symptomatic Seizures after Stroke at a Tertiary Care Hospital

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ABSTRACT

Neurological deterioration can occur in approximately 15% of patients with acute stroke. Several mechanisms can lead to ischemic lesion extension and subsequent neurological worsening, including re-occlusion, edema progression, and cardiovascular instability. Stroke is one of the main causes of morbidity and mortality worldwide. **Objective:** To determine the Incidence and predictors of acute symptomatic seizures after stroke at a tertiary care hospital. **Methods:** This Descriptive Cross-Sectional Study was conducted at Department of Neurology, Civil Hospital, Karachi, Pakistan, from April 19, 2019 to October 18, 2019. Informed consent from all the patients who fulfilled the inclusion criteria was taken after explaining the procedure, risks and benefits of the study. CT scan & continuous twelve-lead ECG were performed. Assessment for associated factors of ischemic stroke i.e., seizure, atrial fibrillation and family history of stroke were noted. All the collected data were entered into the proforma attached at the end and used electronically for research purpose. **Results:** Mean ± SD of age was found to be 63.14±16.7 years. Out of 251 patients, 137(54.6%) patients were male and 114(45.4%) were female. Diabetes Mellitus was noted in 97 (38.6%) patients. Factors associated with acute ischemic stroke i.e., seizure was noted in 31 (12.1%) while atrial fibrillation was noted in 68 (27.1%) patients and positive family history of stroke was documented in 46 (18.3%). **Conclusions:** It is to be concluded that atrial fibrillation was found to be the major modifiable associated factors in the development of stroke. Controlling of these risk factors might reduce the risk of stroke.

INTRODUCTION

Stroke is the second leading cause of death globally. Being responsible for five and half million deaths annually [1] with many more suffering from a high degree of stroke associated morbidity. Stroke is also, a known epileptogenic condition and one of the most frequent causes of acute symptomatic seizure and epilepsy in adults [2]. The incidence of seizure after the stroke has been reported to varying range from 2% to 67% [3]. Stroke increase the risk of seizure by several folds and the reported relative's risk of developing seizure after stroke as compared to general population as high as 35 times [4]. The relationship between seizure and stroke, despite being recognized more than a century ago by John Hughling Jackson [5] is yet to be fully understood. Post-stroke seizure can occur soon after the onset of ischemia or can be delayed. Acute symptomatic seizure following a stroke are thought to result from cellular biochemical dysfunction leading to electrically irritable tissue [6]. Acute ischemia leads to increased extracellular concentration of glutamate, an excitatory neurotransmitter that has been associated with secondary neuronal injury recurrent epileptiform-type neuronal discharge can occur in neural networks of

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surviving neutrons exposed to glutamate [7, 8]. In addition, transient peri-infract depolarization's have been observed in the penumbra after the experimental occlusion of the middle cerebral artery [9]. There is a correlation between the number and total duration of depolarized events and infract volume in the setting of ischemia, perhaps due to reductions in capillary perfusion leading to more profound ischemia in penumbral tissue. Experimental data also suggest that epileptogenesis is enhanced by hyperglycemia at time of ischemia [10]. Acute symptomatic seizure following stroke may have a negative impact on outcome of stroke. Acute symptomatic seizure is thought to be associated with a high risk of status epilepticus and an increased death rate [11]. Some investigators even observed that seizure in post stroke period are independent predictors of mortality in acute stroke. Thus, it is important to be able to know beforehand whether a strike shall result in acute symptomatic seizure by identifying reliable predictors so as to be able to employ early and effective measures (including but not limited to prophylactic anti-epileptic medication) to control them and limit the probable damage that they may cause. Cortical location of stroke and stroke severity and reported, consistently, to be independent predictors of post stroke seizure [12]. Factors associated with acute ischemic stroke reported by different studies i.e., seizures (7.2%), atrial fibrillation (25%) and family history of stroke (12%) [13, 14]. Other probable factors include (but not limited to) male gender, age greater than 65 years, [15] anterior circulation infraction, [16] hemorrhagic infracts, [17] cerebral venous infracts [18] and recurrent stroke [19]. There are several published reports, throughout the world, reporting associated factors of ischemic stroke but very scanty local data is available on the same. As associated factors of stroke in our local population were largely underestimated, this study was aimed to determine the Incidence and predictors of acute symptomatic seizures after stroke at a tertiary care hospital, in a metropolitan city like Karachi.

METHODS

This Descriptive Cross-Sectional Study was conducted at Department of Neurology, Civil Hospital, Karachi, Pakistan, from April 19, 2019 to October 18, 2019. 251 patients with acute ischemic stroke of both gender and age between 18 to 80 years were consecutively selected. Sample Size was calculated via W.H.O. open epi sample size calculator by taking frequency of seizures after acute ischemic stroke as 7.2% [13] with 95% and 3.2% of margin of error. Patients were chosen via non-probability consecutive sampling. Patients with transient ischaemic attack, subarachnoid hemorrhage & venous sinus thrombosis, peripheral nerve disorders like mononeuropathy and radiculopathy, Bell's palsy, vestibular neuritis and extraocular muscle imbalance due to cranial neuropathy, metabolic disorders like hyperthyroidism, hyperparathyroidism and those who were having acute myocardial infarction were excluded from the study. Informed consent from all the patients who fulfilled the inclusion criteria was taken after explaining the procedure, risks and benefits of the study. CT scan & continuous twelve-lead ECG were performed. Assessment for associated factors of ischemic stroke i.e., seizure, atrial fibrillation and family history of stroke were noted. All the collected data were entered into the proforma attached at the end and used electronically for research purpose. Data were analyzed using Microsoft Excel 2016 and SPSS version 21.0. Mean and SD were calculated for quantitative variable like age. Frequencies and percentages were calculated for categorical variables like gender, hypertension, diabetes mellitus, smoking status and associated factors of ischemic stroke i.e., seizure, atrial fibrillation family history of stroke. Data were stratified on the basis of age, gender hypertension, diabetes mellitus and smoking status to see the effect of these on associated factors.

RESULTS

Mean ± SD of age was found to be 63.14 ± 16.7 years. Post-stroke seizures were noted in 12.1% of the patients. Out of 251 patients, 137 (54.6%) patients were male and 114 (45.4%) were female. Hypertension was found to be in 158 (62.9%) patients while Diabetes Mellitus was noted in 97 (38.6%) patients. In distribution of smoking status 62 (24.4%) patients were found to be smoker (Table 1).

Table 1: Sample Description

Variable		n(%)
Gender	Male	137(54.6)
	Female	114(45.4)
Hypertension	Present	158(62.9)
	Absent	93(37.1)
Diabetes Mellitus	Present	97(38.6)
	Absent	154(61.4)
Smoking	Smoker	62(24.4)
	Non-Smoker	189(75.3)

Factors associated with acute ischemic stroke i.e., seizure was noted in 31 (12.1%) while atrial fibrillation was noted in 68 (27.1%) patients and positive family history of stroke was documented in 46 (1—8.3%) (Figure 1).

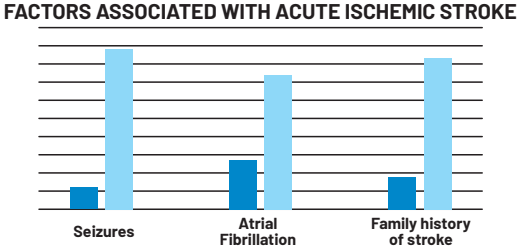

Figure 1: Factors Associated with Acute Ischemic Stroke

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DISCUSSION

Despite new post-stroke management strategies, the stroke remains a serious disease affecting not only the patient but also his family as well. Although, identifying the risk factors and modifying them remain the most important means of reducing stroke incidence. Increasing age is clearly the strongest determinant of the number of new cases of stroke each year. Among the most accepted factors associated with ES after stroke are the level of the patient's disability and hyperglycaemia. It has been shown that early seizures after stroke correlate with the volume of ischemic lesions and that the volume of ischemic lesions is larger in patients with low or normal blood pressure on admission compared to those presenting with hypertension [20, 21]. This is in accordance with our results, suggesting that lower and normal blood pressures on admission are associated with a higher risk of early seizures after stroke. Venous sinus thrombosis is a well-known epileptogenic factor [22]. In addition, recurrent ischemic strokes were also more frequently associated with seizures compared to patients presenting with first stroke. It has been previously shown and confirmed in our study that younger patients (<65 years old) more frequently suffered ES after stroke compared to older patients. It was suggested that cardio-embolic strokes are more likely to be associated with ES after stroke; however, in our subgroup analysis, no difference in ES frequency was between patients with and without atrial fibrillation. Intuitively, there is no reason to suspect that cardioembolic lesions would be more likely than emboli from large-vessel sources to cause seizures, as cardiac and large-vessel emboli frequently involve lesions to distal cortical branches. The findings of our study are comparable with other studies published locally and internationally. A few of which are discussed below in comparison to our study findings [23]. In our study the mean age of the patients assessed was found to be 63.14 ± 16.7 years. In a study conducted by Hundozi *et al.*, the mean age of patients was found as 69 ± 12 years [24]. A study conducted by Naylor *et al.*, reported the mean age of patients as 78 ± 11.56 years [25]. Another study conducted by Bladin *et al.*, reported the mean age of patients as 71.7 ± 13.6% years [26]. In present study, 251 patients were included, out of those, 137 (54.6%) patients were male and 114 (45.4%) were female patients. Hundozi *et al.*, in his study reported that 51.6% were male and 48.2% were female [24]. Naylor *et al.*, also reported the gender distribution in his study as 47.8% male patients and 52.2% female [25]. Bladin *et al.*, reported that 60% males and 40% females were part of the study [26]. In current study, hypertension was noted in 158 (62.9%) patients. The study of Hundozi *et al.*, stated that 68.9% patients were hypertensive [24]. The study of Bladin *et al.*, stated that 57.7% patients had hypertension [26]. In current study, diabetes mellitus was documented in 97 (38.6%) patients. A study of Hundozi *et al.*, indicated that 23% patients were diabetic [24]. In this study, positive smoking status was noted in 62 (24.4%) patients. Bladin *et al.*, also reported that 43.45% were smokers [26]. In our study, the frequency of seizure was found in 31 (12.1%) patients. In this study, atrial fibrillation was noted to be in 68 (27.1%) patients. In the study of Hundozi *et al.*, atrial fibrillation was noted 6.4% patients [24]. The study of Naylor *et al.*, found atrial fibrillation in 31.6% patients [25]. Family history of Stroke in our study was found in 46 (18.3%) patients. The prevalence of family history of stroke in Bladin *et al.*, reported to be in 3.57% patients [26].

CONCLUSIONS

It is to be concluded that atrial fibrillation was found to be the major modifiable associated factors in the development of stroke. Controlling of these risk factors might reduce the risk of stroke. Clinicians need to be vigilant to the potential occurrence of seizures in all patients with ischemic stroke, especially since post-stroke seizures appear to be relatively easily controlled with a single medication.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Nursing Students' Satisfaction with Supervision from Clinical Teachers During Clinical Practice and Their Association with Academic Year

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ABSTRACT

Supervision of clinical teachers during clinical practice is a key component of this education, as it allows students to apply their knowledge and skills in a real-world setting under the guidance of experienced practitioners. **Objective:** To assess Nursing students' satisfaction from the supervision of a clinical teacher during clinical practice and their association with the academic year. **Methods:** This cross-sectional Analytical study was accomplished at two private nursing college in Karachi from 15th September 2022 to 30th December 2022. A total of 100 nursing students from 2nd year and 3rd year were recruited through a convenient sampling technique. Self-structured and pretested questionnaire was used for the collection of data. **Results:** The total participants were 100 males, 97%, and 3% females. Among 100. 12% of participants show low satisfaction, 41% show moderate satisfaction, and 47% show high satisfaction. Furthermore, no association was found with their academic year p-value is 0. 174. **Conclusions:** Based on the study's findings, most nursing students were highly satisfied with the supervision of the clinical teacher. But 12% are still dissatisfied. Moreover, provide additional training to the clinical teacher, adjust the clinical curriculum, or provide more support and resources to the nursing students.

INTRODUCTION

When a person's wants and desires are met, they feel satisfied, which makes them happy. It is a feeling experienced by someone whose performance or outcome met their expectations. As a result, happiness might be characterized as a sense of expectations being met. When one meets expectations, they will feel satisfied. Hence happiness is the product of purposeful achievement [1]. Furthermore, if nursing students do not feel supported by their clinical teachers, they may lose confidence in their abilities to perform their clinical duties. This can impact their future careers as nurses and their ability to provide high-quality care to their patients. The purpose of making nursing education a course of study in universities and colleges was to raise the standard of learning. Providing a solid professional education and recognizing theoretical knowledge and real-world experience is essential. Both were essential for nursing as a professional discipline [2]. It prepares nursing students with the skills and knowledge necessary to provide safe, efficient care. Clinical experience is considered an essential component of nursing education at the undergraduate level [3]. Moreover, the supervision of clinical teachers during clinical practice is a vital component of this education, as it allows students to apply their knowledge and skills in a real-world setting under the guidance of experienced practitioners [4]. Although to prepare nursing students to provide their patients with high-quality care, they must have a positive learning experience. Nursing students are

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prepared for real-world practice through a distinctive methodology called clinical learning experiences [5]. Moreover, A student nurse's transition nurse and, later, the decision to stay in the field are both impacted by the learning experiences [6]. The transition can be made more accessible by preparing students for the work required in an actual clinical setting through beneficial clinical experiences [7]. Healthcare and educational institutions have established clinical placement supervision models with various job titles [8]. University nursing faculty members instructed students in the classroom and followed them to clinical settings in Europe and North America for assessment purposes [9]. Healthcare and educational institutions in Australia hire clinical nurses with a reputation for nursing skills to serve part-time as clinicians and clinical teachers (CT), monitoring and evaluating students' clinical practice. The CT function may also be high, accountable for groups of six or more students, and frequently involves a preceptor [10]. It may also include orienting, rostering, evaluating, and supervising students [11]. Assessing nursing students' satisfaction with the supervision of clinical teachers during clinical practice is a crucial area of research that can provide valuable insights into the effectiveness of clinical education programs and the quality of clinical teaching [12]. It can also help to identify areas for improvement and inform the development of strategies to enhance the quality of clinical education for nursing students [2]. So, this study's purpose was to assess Nursing student satisfaction from the supervision of clinical teachers during clinical practice.

METHODS

A cross-sectional Analytical study was conducted at Suvastu School of Nursing and Health Sciences and Allied Nursing School Karachi, Pakistan, from 15th September 2022 to 30th December 2022. Both 2nd year and 3rd-year students were part of the study. Subjects were approached by a non-probability convenient sampling method. A self-structured and pretested questionnaire was used for the collection of data which was reliable. The reliability of the tool was calculated, which is 0.75. Moreover, the study tool was designed with the help of the literature, which consists of the two-part section, A and B. Section A have four questions about demography Name, Age, Gender, and year of study, and section B has twenty-four questions about satisfaction in the form of a Likert scale. The scaling system is from 1 to 5. 1– Strongly disagree, 2 – disagree, 3–neutral, 4–agree, 5–strongly agree. The satisfaction was measured through 24 items questionnaire. The total score of the questionnaire was 120. The total score was converted into a percentage of those participants who scored below 50%, were considered low satisfaction, 50% to 80% moderate satisfaction, and those who scored above 80% were considered high satisfaction. The sample size was calculated through open EPI version 3 with a 95 % confidence interval with a total population of 150. The obtained sample size is 100. Both 2nd year and 3rd-year students were included in the study. 4th year and 1st-year students were excluded from the study because 1st-year students were not doing proper clinical and 4th year students worked with their preceptors during the clinical. For data collection, permission was obtained from the authorized person of the institutes. After permission, the questionnaire and consent form were discussed with the coordinator of 2nd-year and third-year students of Generic BScN. After that, the class coordinator allowed us to take data from students in the allotted time, approximately half an hour. After this, the consent form and questionnaire were discussed with the student for 10 minutes after the student signed the consent form and filled out the questionnaire. The data collection and study approval were taken from the principals of both institutes. After that, permission was taken from the other institute for data collection. After the permission of the authorized person, the consent form was explained to the participant, and their confidentiality and identity were maintained. Data were analyzed through the statistical tool by SPSS 26.0 version Percentage and frequency were used for the socio-demographic data, and the chi-square test was used for the association.

RESULTS

Table 1 shows the results of demographic variables. The total participants were 100 males, 97 (97%), and 3 (3%) females. Regarding age, 48 participants fall between 18 and 21 years, 48 are aged between 21 and 24, and 4 are between 25 and 29. Furthermore, in the participant year of the study, 81 participants enrolled in 2nd year, which is (81%) and 19 participants enrolled in the third year, which is (19%).

Table 1: Demographic data (n=100)

Gender	Frequency (%)
Male	97(97)
Female	3(3)
Age	
18-21	48(48)
21-24	48(48)
25-29	4(4)
Study year	
2nd year	81(81)
3rd year	19(19)

Table 2 shows the overall level of satisfaction 12% of participants show low satisfaction, 41% show moderate satisfaction, and 47% show high satisfaction.

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Table 2: Overall satisfaction of Nursing Students from their clinical teacher during clinical practice

Participants	Low Level	Moderate Level	High Level
100	12 (12%)	41 (41%)	47 (47%)

Figure 1 also shows the result of overall satisfaction that 12% of participants show low satisfaction, 41% show moderate satisfaction, and 47% show high satisfaction.

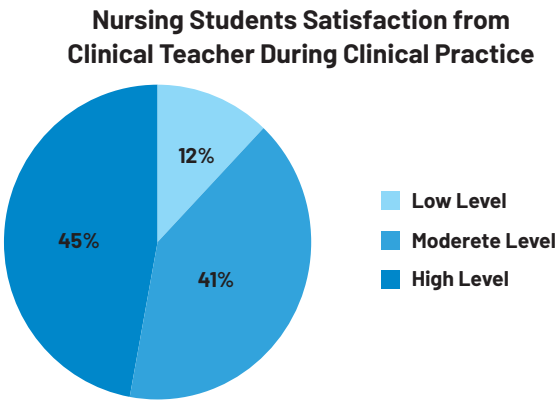

Figure 1: Overall Nursing Students' Satisfaction with Supervision from Clinical Teachers During Clinical Practice

Table 3 shows the association of satisfaction with their academic year 2nd-year students 26.08% of participants show a low level of satisfaction, 73.9% show a moderate level of satisfaction, and 73.9% show a high level of satisfaction. 3rd-year students; 35% of students show a moderate level of satisfaction, and 65% show a high level of satisfaction. And found no association with their academic year p-value is 0.174.

Table 3: The association of satisfaction with their academic year

Academic Year	Level of satisfaction			p-value
	Low	Moderate	High	
2nd year	26.08	73.9%	73.9%	0.174
3rd year	%0%	35%	65%	

DISCUSSION

Assessing nursing students' satisfaction with their clinical teacher during clinical practice is essential to nursing education. Clinical teachers are crucial in helping nursing students develop their clinical skills, knowledge, and professionalism. By assessing nursing students' satisfaction with their clinical teacher, nursing program administrators can identify areas where improvement is needed and ensure that students receive high-quality clinical education. Moreover, the present study result shows that the majority of the participant, 97%, have aged less than 25 years. Similarly, another study by Johannessen *et al.*, result supports the present finding that the majority of the participant, 67.5%, have aged less than 25 years [13]. Although current study results show 3% female and 97% male, in contrast, another study result shows that 88% of the respondents were female and 12% were male. The discrepancy between the proportion of female and male respondents in the two studies suggests that underlying factors may influence the sample selection and recruitment strategies. The present study result shows that 20% of participants were from 3rd and 80% from second years. In contrast, another study's result show. The students were in the 2nd year (75%) and third year 25% [14]. To address this issue, researchers should be transparent and detailed in their reporting of the sample characteristics, including the academic year, program or faculty, and any other relevant demographic variables. They should also consider using stratified random sampling or oversampling techniques to ensure a more representative sample that reflects the diversity of the population of interest. By doing so, researchers can increase their findings' reliability, validity, and generalizability and contribute to advancing scientific knowledge. The current study result shows that 47% of the participant are highly satisfied, and 41%participant show moderate satisfaction. In contrast, a recent survey in Spain shows that 79.2% of participants reported being satisfied, and 20.8% reported dissatisfaction [13]. Nursing students who are satisfied with their clinical teacher will likely have a more positive learning experience. A positive learning experience can increase students' motivation to learn, leading to better academic performance and greater confidence in their clinical skills [15]. Satisfaction results have a longer-lasting effect; they are more significant than achievement outcomes. It mentioned that employee and nursing student satisfaction are similar, leading to retention and other advantageous outcomes. Because of this, satisfaction is a crucial result of interest in a time of nursing shortages. "Amount of enjoyment of the clinical field placement" satisfaction from the clinical learning setting [16]. The present study result shows that 42.5% of participants were satisfied in the second year, and 65% were satisfied in the third year. Along with this, no association was found between academic year and satisfaction. Similarly, the Jaradeen *et al.*, study that supports the present study found that 28.4% of participants were satisfied in the second year and 37.3% in the third year [17]. The p-value of 0.174 indicates no significant association between the variable (academic year) and the outcome variable being studied. In other words, the results suggest that the academic year has no statistically significant effect on the outcome variable. However, it's important to note that a p-value of 0.174 still indicates a possible relationship between the two variables, albeit not a strong one. Therefore, exploring the data further and considering other factors that could potentially affect the outcome variable may be worthwhile. Additionally, it's essential to keep in mind that a non-

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significant result may be due to limitations in the study design or sample size, so further research may be needed to confirm the findings. The present study result shows that 12% of the participants are still dissatisfied. Similarly, a study reported that 20.8% of participants have dissatisfied [14]. Nursing students who are not satisfied with their clinical teacher may not be motivated to learn and may not perform well in their clinical practice [18]. This can result in poor academic performance and lower grades. A dissatisfied nurse could compromise the team's functioning and provide poor-quality medical care [19]. It is impossible to overstate the significance of nursing, which is at the center of nursing education. This is because student nurses are best prepared for the realities of their professional tasks in the clinical context [20]. Clinical teachers who are approachable, supportive, and understanding can create a positive learning environment that fosters open communication and mutual respect. Students may feel more comfortable asking questions and seeking clarification when they feel their clinical teacher is supportive and approachable [21].

CONCLUSIONS

While it is encouraging that a large percentage of nursing students are satisfied with their clinical teacher, it is essential to address the concerns of the 12% of nursing students who showed low satisfaction. This may involve further investigating their dissatisfaction and developing strategies to address their concerns. Nursing program administrators may consider conducting regular satisfaction surveys to ensure that nursing students continue receiving high-quality clinical education and support.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Frequency of Thyroid Dysfunction in Diabetic Patients

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ABSTRACT

Thyroid hormones are involved in the control of insulin secretion, beta-cell function/multiplication, liver glucose synthesis, output and peripheral utilization. Thyroid dysfunction identification and correction help in glycemic control. **Objective:** To know the frequency of thyroid dysfunction in diabetic patients. **Methods:** This descriptive cross-sectional study was done in the Medical-C Department, Ayub Teaching Hospital Abbottabad from July 2018 to August 2019. Total 150 diabetic patients were enrolled by using non-probability consective sampling. Patients were labelled as diabetics on the basis of diabetes history, anti-diabetic medications use, high blood glucose (>200mg/dl) on presentation or on previous high blood sugar reading or a high HbA1c value. Fresh venous blood sample was sent for thyroid function tests (T3, T4 and TSH). Thyroid dysfunction in our study was defined as patient having Thyroid Stimulating Hormone (TSH) value above or below the normal range. Data of patients were collected on study pro forma and was analyzed using statistical program SPSS version-20.0 **Results:** There were 67 (44.66%) male and 83 (55.33%) female patients. The mean age was 51.83 ± 14.52 years. Thyroid dysfunction was detected in 37 (24.66%) study participants. Out of 67 male patients, 11 (16.41%) had thyroid dysfunction and out of 83 female patients, 26 (31.32%) had thyroid dysfunction. Subclinical hypothyroidism was present in 4 (2.7%), 5 (3.3%) had hypothyroidism, 20 (13.3%) had subclinical hyperthyroidism and 8 (5.3%) had hyperthyroidism. **Conclusion:** This study suggests that a significant portion of diabetic patients suffer from thyroid dysfunction.

INTRODUCTION

Diabetes mellitus and thyroid hormone abnormalities are among the common endocrine problems [1, 2]. High blood sugar is due to decrease in insulin secretion, less glucose utilization and increased glucose production. Diabetes is one of the main reasons of end-organ renal failure, lower limb amputations and adult blindness [3, 4]. Diabetes mellitus is a major health threats for the 21st century. Thyroid abnormalities are 2nd common endocrine dysfunction. The rise in patient's number with diabetes has led to significant increase in health-related budget [5]. In 2021; International Diabetes Federation (IDF) said that about 537 million adults are diabetic which 10.5% of the world population is. It is predicted to rise to 643 million by 2030 and to 783 million (12.2%) by 2045. In 2021, highest diabetes prevalence rates were stated in Pakistan (30.8%), French Polynesia (25.2%) and Kuwait (24.9%). It is expected that Pakistan, Kuwait and French Polynesia will have highest prevalence rates by 2045. About 6.7 million adults have died as a result of diabetes or its complications in 2021 which is 12.2% of total deaths in the world [6]. Thyroid hormones control the metabolism of nucleated cells (through cross-talk with nuclear receptors and with the help of corepressor- nuclear corepressor under the influence of thyroid hormones mediate basal repression and ligand-induced gene activation or repression). The diseases involving imbalance of thyroid hormones are

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found commonly in the world population [7, 8]. There prevalence of thyroid diseases is different in different general populations. It ranges from 6.6% to 13.4%. Its prevalence in general papulation in United States is 5.9% and in UK is 6.6%.9 It is shown that hypothyroidism 'prevalence is between 0.2% and 4.8% whereas hyperthyroidism' prevalence between 0.5% and 3.0% [10]. The co-existence of diabetes and thyroid disease is common [11]. Thyroid hormone abnormalities are present more frequently in diabetic patients and mutually affect each other [12]. Thyroxine and triiodothyronine (T3) excess increases the glucose production in body, increasing insulin need. These reduce the insulin sensitivity in liver. Pre & post-meal insulin/proinsulin levels and free fatty acids concentrations are high in hyperthyroidism. Oral glucose tolerance test leads to increase in glucose and insulin response in patients having hyperthyroidism.4 Poorly controlled diabetes leads to low blood level of thyroxine (T4) and triiodothyronine (T3) [13]. Thyroid hormone abnormalities in diabetic patients increases the risk of its implications [14]. Studies have shown impaired glucose tolerance in 57% of hyperthyroid patients which dropped to 30% when patients were rendered euthyroid [12]. Thyroid hormone abnormalities in diabetics is estimated about 10–24% [15]. This common co-existence of diabetes and thyroid dysfunction led to the suggestion by American Diabetes Association (ADA) that people with diabetes must be checked periodically for thyroid dysfunction [16]. Thyroid hormone abnormalities should be checked yearly in patients with diabetes to detect asymptomatic patients [17]. Patients having thyroid hormone abnormalities may be tested for abnormal glucose metabolism as there is increase in glucose production in liver, rapid intestinal glucose absorption, and decreased insulin sensitivity [18-20]. The purpose of our research study was to check the frequency of thyroid disorders in diabetic patients in our hospital. As diabetes is among the commonest diseases in our country and admissions due to diabetes complications have a major part in hospital economic burden. Thyroid dysfunction in diabetic patients increases the risk of complications so results of this study would be useful to devise interventions at the level of planning, care provision and management.

METHODS

It was a cross-sectional study which was conducted in Medical C department of Ayub Teaching Hospital, Abbottabad from July 2018 to August 2019. Total 150 diabetic patients were included through non-probability consecutive sampling. By using WHO software for sample size determination in health studies, sample size was calculated. Formula to determine proportions with specified absolute precision was used by keeping Confidence level at 95%, anticipated proportion of thyroid dysfunction at 6.6%[9] and an absolute precision of 4%.[13] The study included diabetic patients of both genders who were admitted and were between the ages of 16 and 80 years. Those patients who had diabetes duration for less than 12 months were excluded from the study. Patients were documented as having diabetes if they have known from their history or from their previous documents; they were already on anti-diabetic medications, if their fasting blood sugar was ≥ 126 mg/dl, random blood sugar level was ≥ 200 mg/dl or HbA1c value was ≥ 6.5 %. Thyroid dysfunction was diagnosed in our study when patients had a known thyroid dysfunction status or if their TSH level was outside the normal range (0.4–4.5mIU/L). Patient with TSH level below 0.4 mIU/L with normal T3 and T4 were labelled as subclinical hyperthyroid. Patients with TSH level below 0.4 and raised T4 & T3 were labelled as hyperthyroid. Patients with TSH level above 4.5 mIU/L and normal T3 & T4 were labelled as subclinical hypothyroid. Patient with TSH level above 4.5 mIU/L and low T3 & T4 were labelled as hypothyroid. Data of the included patients were collected on a structured pro forma. Approval of Hospital administration and Ethical Committee of the institution was taken. Informed consent from every conscious patient and from the attendants of unconscious patient after full explanation of study work. Patients with diabetes mellitus who were admitted in medical unit and who also met the inclusion criteria were enrolled in this study. History was documented regarding diabetes, glycemic control, hypoglycemic medications use, previous blood sugar test reports, thyroid hormone abnormalities, thyroid dysfunction medication use and previous thyroid function test reports. Fresh blood samples were taken and sent for assesment of the glycemic control & thyroid dysfunction. The collected data were entered and analyzed by using statistical program SPSS version 20.0. Categorical variables such as gender, presence or absence of thyroid dysfunction and type of thyroid dysfunction were described as frequencies and percentages. Quantitative variables such as thyroid function tests levels were reported in terms of mean ± standard deviation. Stratification of thyroid dysfunction was done by its type with age group and gender and Chi-square test was applied after stratification at 5% level of significance.

RESULTS

In this study, 150 patients of diabetes mellitus were enrolled having ages of 16 to 80 years. The mean age of the patients was 51.83 ± 14.52 years. There were 67 (44.6%) male and 83 (55.3%) female patients in the study (Table 1).

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Table 1: Frequency of gender of the patients

Gender	Frequency (%)
Male	67(44.66)
Female	83(55.33)
Total	150(100)

In frequency of thyroid function status, 37 (24.66%) patients were found to have thyroid dysfunction while 113 (75.33%) patients were found to have eu-thyroidism (Table 2).

Table 2: Frequency of thyroid function status of patients

Thyroid Status	Frequency (%)
Thyroid dysfunction	37(24.66)
Euthyroid	113(75.33)
Total	150(100)

Moreover, patients found with subclinical hypothyroidism were 4 (2.7%), with hypothyroidism were 5 (3.3%), subclinical hyperthyroidism were 20 (13.3%) and with hyperthyroidism were 8(5.3%) patients (Table 3).

Table 3: Thyroid status of patients

Thyroid Status	Frequency (%)
Subclinical hypothyroid	4(2.7)
Hypothyroid	5(3.3)
Euthyroid	113(75.3)
Subclinical hyperthyroid	20(13.3)
Hyperthyroid	8(5.3)
Total	150(100)

Frequency of age group is shown in table 4.

Table 4: Frequency of age group of the patients

Age Groups	Frequency (%)
16 to 30 years	16(10.66)
31 to 45 years	30(20)
46 to 60 years	69(46)
>60 years	35(23.33)
TOTAL	150(100)

Thyroid hormone level distribution level is shown in table 5.

Table 5: Thyroid hormones level distribution

Thyroid hormones level	N	Minimum	Maximum	Mean ± SD
Serum TSH level	150	0.003	176.213	3.733 ± 16.526
Serum T3 level	150	0.05	4.97	1.587 ± 0.768
Serum free T4 level	150	0.21	4.65	1.448 ± 0.575

Frequency distribution of age with thyroid dysfunction is shown in table 6.

Table 6: Frequency distribution of age with thyroid status

Age groups	Thyroid status of the Patient					Total	p-value
	Subclinical hypothyroid	Hypothyroid	Euthyroid	Subclinical hyperthyroid	Hyperthyroid		
1(16-30 years)	0	0	12	4	0	16	0.254
2(31-45 years)	1	2	20	3	4	30	
3(46-60 years)	2	1	51	12	3	69	
4(more than 60 years)	1	2	30	1	1	35	
Total	4	5	113	20	8	150	

The frequency distribution of gender with thyroid status is shown in Table 7. With regard to the association of thyroid hormone abnormalities with the duration of diabetes, p-value was 0.115 stating statistically insignificant relation of thyroid dysfunction with diabetes duration. Moreover, with regard to the association of thyroid dysfunction with age and gender of study participants, the p value was found to be 0.254 and 0.126 respectively which indicates statistically insignificant relationship of thyroid dysfunction with age and gender of the patients.

Table 7: Frequency distribution of gender with thyroid status

Thyroid status	Gender of patient		Total N (%)	p-value
	Male N (%)	Female N (%)		
Subclinical hypothyroid	2 (1.3%)	2 (1.3%)	4 (2.6%)	0.126
Hypothyroid	0 (0%)	5 (3.3%)	5 (3.3%)	
Euthyroid	56 (37.33%)	57 (38%)	113 (75.33%)	
Subclinical hyperthyroid	7 (4.6%)	13 (8.66%)	20 (13.26%)	
Hyperthyroid	2 (1.3%)	6 (4%)	8 (5.3%)	
Total	67 (44.66%)	83 (55.33%)	150 (100%)	

DISCUSSION

The prevalence of thyroid hormone abnormalities in common population is stated in literature as 6.6% whereas its prevalence in diabetic patients is 10.8% [21]. Prevalence of hypothyroidism is stated 0.2-4.8% whereas of hyperthyroidism is 0.5-3.0%.10Thyroid disorders are more common in diabetic patients [22-25]. Our study included 150 patients, 68 (45.3%) were male and 82 (54.7%) were female with female to male ratio of 1.20. The study done by Ogbonna and Ezeani had 56.5% female participants and 43.5% male participants, result is similar to our study [26]. The mean age in our study was 51.83 ± 14.52 years. Mean age in the study of Khan *et al.*, was 51.2 ± 6.18 years, in the study of Shahbazian *et al.*, mean age was 49.8 ± 11.4 years, study done by Khassawneh *et al.*, reported mean age of 60.14 ± 12.21 and Ogbonna *et al.*, reported mean age of 57.5 ± 9.3 years [12, 27, 9, 26]. Mean age of our study was comparable to all these studies. Our study showed that duration of diabetes was 1-5 years in 33.33% of the patients, 5-10 years in 36% patients and more than 10 years in 30.66 %. Data collected by Khan *et al.*, in Karachi showed that 34.37% patients had diabetes of 5 years duration, 41.31 % patients had diabetes duration of 5-10 years and 24.32 % had diabetes for more than 10 years [12]. The study done by Khurana *et al.*, showed that 12.5% of the patients had diabetes duration of 1 year, 34.37% had diabetes duration of 1-5 years, 40.62 % had it for 6-10 years and 12.5 % had diabetes duration of more than 10 years [28]. Like our study, the other 2 studies showed that most patients included had diabetes duration of 5-10 years. Our study had thyroid dysfunction in 24.66% of the patients, out of these 18.66% of the patients had hyperthyroidism and 6 % had hypothyroidism. These results were similar to the study done by Khan *et al.*, in Karachi which showed thyroid

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dysfunction in 19.7% with 13.20% hyperthyroidism and 6.50% hypothyroidism [12]. Data collected by Saran *et al.*, in Northern India reported thyroid dysfunction in 33.3% of the patients, out of these 11.1% of the patients had subclinical hypothyroidism, 14.4% patients had hypothyroidism, 4.9% had subclinical hyperthyroidism and 2.9% of the patients were diagnosed with hyperthyroidism [29]. This study had thyroid dysfunction frequency similar to our study but had higher frequency of hypothyroidism whereas in our study hyperthyroidism was more common disorder. Demitrost *et al.*, in their study observed thyroid dysfunction of 31.2% with 16.3% subclinical hypothyroidism, 11.4% hypothyroidism, 2% subclinical hyperthyroidism and 1.5% hyperthyroidism [16]. Overall thyroid dysfunction frequency is similar to our study but here subclinical hypothyroidism (16.3%) is more common in contrast to subclinical hyperthyroidism which was more common in our study (13.26%). Khurana *et al.*, reported 16% thyroid dysfunction with subclinical hypothyroidism in 7.5% patients, hypothyroidism in 4.5%, hyperthyroidism in 2.5%, and subclinical hyperthyroidism in 1.5% [28]. Thyroid dysfunction frequency is comparable to our study but hypothyroidism is more common here. The study done by Kaeley *et al.*, showed thyroid dysfunction in 24%, out of these 19% had hypothyroidism (11% had subclinical hypothyroidism and 8% hypothyroidism) and 5% had hyperthyroidism (all had subclinical hyperthyroidism) [30]. Ogbonna *et al.*, showed 12.4% thyroid dysfunction in type 2 diabetes mellitus patients (hypothyroidism in 11.6% and hyperthyroidism in 0.8% of the patients) [26]. Thyroid dysfunction in all these studies was similar to our study but hypothyroidism was most common disorder in contrast to our study where hyperthyroidism was most common disorder. In our study, out of 67 male patients 11 (16.41%) patients had thyroid dysfunction and out of 83 female patients, 26 (31.32%) patients had thyroid dysfunction showing that thyroid dysfunction was more pronounced in females which is according to previous studies conducted [3].

CONCLUSIONS

This study suggests that a significant portion of diabetic patients suffer from thyroid dysfunction. More studies are required to establish this association, its implications and inclusion of routine screening of thyroid functions during admission and OPD visits of diabetic patients.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Improving the Quality of MCQs by Enhancing Cognitive Level and using Psychometric Analysis

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ABSTRACT

Faculty development programs are an essential part of any reputable institution. Faculty training through various conferences and workshops will help develop competencies for high quality assessment. **Objective:** To evaluate the effectiveness of ongoing faculty training initiatives aimed at improving the standard of MCQ development. **Methods:** Faculty members of FRPMC were engaged in this observational, quasi-experimental study. Convenient sampling was done. Three different questionnaires were provided to the participants. The participants were tasked with accurately identifying flaws, cognitive levels in the pre- and post-test questionnaire items, as well as post hoc analysis to discard or modify the Items. **Results:** Items with multiple flaws were assessed with mean value in pre-test score was 1.349 compared to post-test score 3.442 which were statistically significant (p-value <0.05). The pre- and post-test questionnaire to correctly identify the cognitive levels showed pre-test 77.5% compared to 87.5% participants identified correct cognitive level in post-test. In post hoc analysis, participants were able to identify 5 questions out of 7 which need to be discarded and 3 questions out of 5 which needed improvement according to the key given to them. **Conclusions:** Our study revealed that workshop helped faculty identify item flaws with significant improvement in pre- and post-test scores. The cognitive capabilities of faculty were improved in all three levels of cognition, with greatest improvements shown in higher complexity questions (C3). There was a noticeable improvement in knowledge and the participant's capacity to identify and correct errors.

INTRODUCTION

Assessment is a very dominant force which drives learning and acts as a prime motivator for students' performance for all the teaching and learning that takes place in the medical curriculum. The main purpose of assessment is to provide feedback on the process of learning [1]. Furthermore it also helps in making a choice of assessment methods which would best suit learning. It is important, whichever assessment method is used, it must be valid, reliable, fair, feasible and objective [2]. A wide range of assessment methods are available in medical education which include short essay questions, short answer questions, multiple choice questions, checklists, objective structured practical examination (OSPE), objective structured clinical examination (OSCE), direct observation of procedural skills (DOPS), objective structured assessment of technical skills (OSTATS), short case, long case, extended matching items, portfolios, log book, simulators, peer assessment and standardized patients (SP) [3]. Multiple-choice questions (MCQs) are the most frequently used method for written assessment. It measures different cognitive levels ranging

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from recall, comprehension to analysis and can be designed to measure application of knowledge according to bloom's taxonomy. MCQs have better validity, reliability and objectivity when compared to other written test assessment methods such as True/False questions, SAQs, SEQs, long essay questions [4]. MCQs development is a time consuming exercise. A typical approach of developing MCQs include selection of the topic, the development of a stem or a case, lead-in question, list of distractors or options and a key. It is imperative to review each MCQs to remove flaws and errors for further improvement in the quality of the MCQs [5]. It is not possible for anyone to develop a good quality MCQ without a thorough peer review. For this purpose a review panel of experts can be established who conscientiously review and remove potential flaws in the items to improve the quality of MCQ based written assessment [6]. The first element affecting the quality of MCQs is the absence of a higher cognitive level. Most of the time, C1-level questions or recall questions are asked in the exams [7]. These questions assess only surface knowledge and check students' capability of memorization. They are unable to assess students' deep knowledge and problem solving skills as they did not use clinical vignette or problem based questions in them. According to Pickford and Newcomb, C1 level questions in MCQs should only be used to assess factual knowledge [8]. In the modern curriculum it should be discouraged as much as possible. Higher cognition in MCQs can be achieved through using interpretation, comprehension, analysis, synthesis, correlations, clinical decision making and problem solving questions according to Modified bloom's taxonomy [9]. Higher cognitive questions help in building more practical, clinically relevant questions in the exams. The higher cognitive questions are often referred to as C2 and C3 questions. The paucity of C3 problem-based questions is a result of the fact that most examiners found it challenging to create these types of questions, which need a lot of faculty time and effort. In addition, discussions and consultations with an interdisciplinary team were also required to develop these types of questions. As most of the exams in our current setting consist of C1 questions, as students prefer surface or factual knowledge, recall questions in the exams were easier to answer and produce better results in exams for the students and possess less burden on faculty [10]. Realizing that these questions only check recall and surface knowledge, it is highly recommended to construct questions that need higher cognitive abilities in order to assess students' problem-solving and deep learning strategies [11]. The second most important factor which compromises the quality of MCQs is the presence of unstable data which is the presence of flaws and errors in the MCQs [12]. These errors or flaws are usually, presence of spelling or grammatical mistakes, use of absolute terms, use of vague terms, implausible distractors, absence of lead in statement, use of extra details or presence of long statement in option, use of all of the above or none of the above in the statement option, negative stem, lack of homogeneity in the options, use of jargons, presence of cues leading to correct answers, word repeats are some of the major flaws present in MCQs [13]. Third aspect which would be considered is to evaluate previously held exams post-hoc analysis reports. Post hoc analysis of items is done through psychometric analysis. This Psychometric analysis of Items or MCQs in a post-hoc analysis report identifies discrepancies of test items. This type of analysis helps medical educationists and faculty to improve the validity and reliability of the exam [14]. Psychometrics analysis of Items is basically composed of difficulty index, discrimination index, and distractor analysis. Normally items too difficult or items too easy are discarded from paper. In other words items which have a very low difficulty index or with a very high difficulty index are excluded from the exam paper. Items which were unable to discriminate between a good performer and poor performer were also discarded or marked as revision required and is called discrimination index. Distractor analysis analyzes the presence of noisy distractors and silent distractors. The options in the MCQs which distract students more than a key or correct option are not required, similarly options which are silent or do not participate to distract examinee were also eliminated [15]. Furthermore, to check the internal consistency of the MCQs paper, Cronbach's alpha values are calculated. If reliability coefficient does come under acceptable range, those items need further improvement or be discarded from the exam. All of these psychometric parameters of item analysis mentioned above improves the reliability and validity of the exam [16].

The mission of Fazaia Ruth Pfau Medical College (FRPMC), a newly established medical college is to produce competent physicians through excellence in medical education and research and to produce future doctors who are community oriented and socially accountable. Hence, the strategies of assessment methods adopted in the curriculum should also depict the same institutional philosophy. In order to achieve this, each assessment instrument should be designed which allows students to be self-directed learners, lifelong learners, problem solvers, practical in their approach. This is accomplished by modifying and raising the cognitive level of our assessment methodologies. Without creating cohesive faculty development programmes for evaluation methodologies, this would be a very difficult task. At FRPMC, our medical educationists regularly train faculty in house through

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certificate courses, Continuous medical education meetings and seminars. In addition to this faculty trained through various faculty training programs outside college through conferences and workshops to develop competencies for high quality assessment. The aim of our study was to see the impact of ongoing training programs of faculty to improve the quality of MCQs development. Faculty would be able to achieve the following objectives through training (i) develop higher cognitive level in MCQs development (ii) identification of various items flaws and errors in MCQs (iii) eliminate the items on the basis of Item analysis and distractor analysis (iv) retain only items with good reliability coefficient.

METHODS

The study design was observational, quasi-experimental involving faculty of Fazaia Ruth Pfau Medical college, 100 faculty members took part in this study including faculty from basic and clinical health sciences from junior to senior level. The participants were the faculty members who have not attended any workshop on MCQ development previously or those faculty members who have attended workshop but still lacking training in MCQ development. Observers were from the faculty of medical education experienced in conducting workshops in medical education. The study period was from January 2021 till April 2023. Convenient sampling was done and data was analyzed using pre- and post- testing through paired t-test in SPSS version 20.0 with a quasi-experimental pre- and post-test study design. The faculty were given pre-test questionnaires before the start of workshop and post-test questionnaires were given to participant at the end of study. Three different objectives were studied using three different questionnaires, to check capacity of faculty members to correctly identify various attributes which were involved in improving the quality of MCQs. The first questionnaire was given to 50 participants who were assigned to correctly identify flaws, errors in the items. Pre-test questionnaire portion was given before the training program while the post-test portion of the questionnaire was given after the training. There were 25 items (MCQs) each containing 3-6 item flaws. Faculty are given a task to correctly identify flaws and errors from each item. See Tables 1 for list of Flaws and Errors in MCQs from where the questionnaire was derived. After pre-test, faculty were trained in faculty training session where they were told about all possible flaws and errors and after the session post-test portion of questionnaire was distributed. This post-test questionnaire was the same as the pre-test questionnaire. Both pre-post results were compared in SPSS as paired t-test.

Table 1: List of Flaws and Error in MCQs provided to Faculty with the questionnaire

S. No	List of Flaws and Errors in MCQs
1.	Lack of leading Stem
2.	Lack of Clinical vignette
3.	Grammatical mistakes
4.	Ambiguous or unclear language
5.	Use of All of Above
6.	Use of None of Above
7.	Use of Vague terms
8.	Negatively framed question
9.	True and False or Fill in the Blank type questions
10.	Use of Abbreviations and Jargons
11.	Use of Absolute terms
12.	Problem in stem is not related to options given
13.	Presence of long option as cue
14.	Repeat of sentence in stem and option providing cue
15.	Lack of homogeneity in the options
16.	Very Complex and complicated stem or question

The second pre- and post-test questionnaire comprised 12 MCQs in which another 50 faculty members were assigned to correctly identify the cognitive levels (C1, C2, C3). Like before, pre- and post-test results of both questionnaires were compared in SPSS using paired t-tests. Third questionnaire was given in the form of a report of the 2nd year MBBS Nutrition module consisting of post hoc item analysis. This questionnaire was given to all 100 participants. This report was converted into a questionnaire in which details of item analysis for each MCQ or item were present (Means Difficulty index, Discrimination Index and Option analysis were already calculated for each item). Faculty were assessed to make decisions regarding which questions (MCQs) to keep, reject, or mark for revision based on the data presented to them.

RESULTS

Results of the Table 2 show comparison of mean scores of pre-test and post-test of the participants who were trained in the MCQ development workshop. The test consisted of 25 questions and each question had multiple flaws. The test score was based on the number of flaws identified by the participants and scores were calculated according to the key compiled by the trainers. There is a significant difference in the scores of pre-test when compared to post-test after the training workshop. The difference was comparatively less in five items (Item No: 17, 18, 19, 23, 25) but still statistically significant (<0.05). Therefore it can be inferred that participants' ability to identify flaws and errors in MCQs improved after attending the training program.

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Table 2: Frequencies of Detection of Flaws & Errors in the items. (n=50)

Q. #	No. of Flaws	Mean of Pre-test Score	Mean of Post-test Score	Mean Difference	p-Value
1	4	0.84	3.40	2.56	0.000
2	5	0.72	3.40	2.68	0.000
3	6	1.76	4.40	2.64	0.000
4	6	2.20	3.72	1.52	0.000
5	5	1.00	3.52	2.52	0.000
6	4	1.24	3.76	2.52	0.000
7	5	0.56	3.48	2.92	0.000
8	5	0.44	3.60	3.16	0.000
9	5	0.80	3.76	2.96	0.000
10	3	1.24	2.84	1.60	0.000
11	8	1.84	3.88	2.04	0.000
12	7	0.72	3.68	2.96	0.000
13	4	0.96	3.28	2.32	0.000
14	2	0.04	1.68	1.64	0.000
15	2	0.36	1.64	1.28	0.000
16	4	1.00	3.00	2.00	0.000
17	4	2.00	3.00	1.00	0.05
18	5	2.00	3.00	1.00	0.05
19	3	1.00	2.00	1.00	0.05
20	4	1.00	4.00	3.00	0.000
21	5	2.00	4.00	2.00	0.000
22	6	3.00	5.00	2.00	0.000
23	4	2.00	3.00	1.00	0.05
24	5	2.00	5.00	3.00	0.000
25	5	3.00	4.00	1.00	0.05

* p-value 0.05

Table 3 shows the mean value of detection of flaws in pre-test score is 1.349 compared to post-test score i.e. 3.442.

Table 3: Comparison of Pre- and post-test scores for item flaws and errors

Comparison	n	Mean ± SD	No. of Questions	Sig Value
Pre-Test Score	50	1.3488 ± .78685	25	0.003
Post-Test Score		3.4416 ± .83845	25	

Table 4 represents the exercise to detect the correct cognitive level of given MCQs by the participants. The pre- and post-test questionnaire comprises 12 MCQs in which faculty were assigned to correctly identify the cognitive levels (C1, C2, C3) according to Bloom taxonomy. By comparing their results, it is revealed that in pre-test the percentage of participants who perceive correct cognitive level is 77.5% compared to 87.5% participants who detect correct cognitive level in post-test. This table also shows individual question wise analysis of detecting correct cognitive level in pre-test & post-test. It is evident from the results that participants identified the cognitive level more accurately, especially at C3 level in comparison to C1 or C2 level, after the training in post-test.

Table 4: Detection of correct cognitive level on MCQs (n=50)

Question #	Item with cognitive levels	Pre-test score	Post-test score	p-value
		% Identified	% Identified	
1	C1	70%(35)	74%(37)	0.072
2	C1	74%(37)	84%(42)	
3	C1	80%(40)	94%(47)	
4	C1	90%(45)	92%(46)	
Mean - Cognitive level 1 (C1)		78%(39)	86%(43)	
5	C2	78%(39)	80%(40)	0.135
6	C2	76%(38)	82%(41)	
7	C2	80%(40)	86%(43)	
8	C2	68%(34)	90%(45)	
Mean - Cognitive level 2 (C2)		76%(38)	84%(42)	
9	C3	90%(45)	96%(48)	0.026
10	C3	68%(34)	90%(45)	
11	C3	80%(40)	92%(46)	
12	C3	72%(36)	86%(43)	
Mean - Cognitive level 3 (C3)		78%(39)	92%(46)	
Mean of all cognitive levels		78%(39)	88%(44)	

The Table 5 describes responses obtained from participants after reviewing a post hoc analysis report consisting of details of each item showing values of difficulty index, discrimination index, and distractors analysis provided to them as a post hoc report. The participants in these 12 items were given a task to

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accurately identify those items which need revision or rejected or retained based on their observation of the item analysis report. For all participants the accuracy to identify the items which need to be rejected from the questionnaire came out to be 71.4% and accuracy of participants to mark items for further improvement was 60%. With respect to the quantity of item analysis instruction they received, the results in this area were moderate.

Table 5: Accuracy of correctly identifying items from item analysis report

Items which need to be discarded according to the key	Total # of items identified by the participants which need to be discarded	Accuracy of detection in percentage	Total # items which need improvement according to the key	Total # of items identified by the participants which need improvement	Accuracy of detection in percentage
7	5	71.43%	5	3	60.00%

DISCUSSION

Prior research demonstrated that medical faculties with formal training can be more effective in their professions. Typically, teachers create the test questions themselves, though occasionally they use item test banks as a source to create new items. Faculty can develop their skills in creating effective MCQs by participating in writing workshops for MCQ items in a positive environment [17]. Our findings demonstrate the efficacy of writing workshops for MCQs was beneficial in improving the mean scores and outcome related to questions. The improvement between pre- and post-training scores shows a considerable positive impact on the participants' capacity to produce high-quality test items. After training, items flaws identified showed statistically substantial increases in mean item quality scores. Study by Nemec and Welch also signifies the improvement in quality of MCQS through faculty development seminars [18]. MCQ quality was observed to have improved by Al-Faris *et al.*, after a one-day session [19]. The value of the workshop is exemplified by the fact based on the difference in score of almost 50% in the quality of the questions on the pre-test and post-test in our study. This is emphasized by Dellinges and Curtis in their study, which found that a brief, one-hour training session for dental school faculty members resulted in considerable increases in the quality of internal MCQ item-writing [20]. Major shortcomings included a lack of homogeneity, an incorrect lead-in, improbable distractors, a clinical vignette with insufficient data, options that weren't alphabetized, and the use of negative stem. In a study by Rush *et al.*, odd stem construction, improbable distractors, and longest response is correct were the most prevalent errors in item writing [21]. Local study revealed flaws most frequently observed were, conflicting and confusing information in the stem; a lack of a clinical scenario; and an evaluation of simple recall items [22]. All of the above, none of the above and unfocused questions were less frequent in our study which is commonly reported by medical educationist as a common item writing flaws [23]. The annual flaw rates ranged from 21% in 2011 to 67% in 2009. Item flaws not only cause systemic mistakes but can harm medical students. Because of these flaws, some students may find it simpler to respond to a question accurately based on their test-taking abilities rather than their knowledge base. On the other hand some students might have difficulty in answering such MCQS just because of lack of clarity which confuses the students' understanding. Pre- and post-workshop assessments of the participants' cognitive capabilities revealed significant improvements in all three levels of cognition, but the greatest improvements were shown in higher complexity questions (C3). It might be because recall-level MCQs are simpler to make and require less time and information than problem-solving MCQs, which demand for experience and training. Abdulghani *et al.*, revealed significant improvement in mean score for high cognitive questions after a longitudinal faculty training [24]. Tenzin *et al.*, produced similar results [25]. Following the session, there was a noticeable improvement in knowledge and the participant's capacity to identify and correct errors. Besides pointing out item flaws, the majority of the questions (70%) that needed to be discarded and 60% that needed improvement were also selected by the participants when they were given sets of questions (pre- and post-workshop) with specified standards of difficulty and discriminating index. Such workshops demonstrate a considerable improvement after focused training in item writing as our faculty is usually busy in academic responsibilities and are more involved in teaching rather than assessing the students. These sessions will assist the faculty in identifying components that are improperly designed and focusing their attention on optimizing them to raise the standard of the question bank [26]. The methodology used for this research divided the 'item writing' into three different areas of research. This division provided detailed comparison between untrained and trained faculty. The sample size was limited to only 103 participants. Only immediate effect of workshop was taken into consideration. Application of this focused training on 'item writing' must be incorporated in their real life practices. Regular analysis of 'items' should be done to determine the long term effect of training programs for faculty. This will help to find out areas for improvement in assessment especially item writing.

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CONCLUSIONS

The faculty training for MCQ development had a significant effect on the producing high quality MCQs. Our study revealed that workshop helped faculty identify item flaws with significant improvement in pre- and post-test scores. The cognitive capabilities of faculty were improved relatively in all three levels of cognition, but the greatest improvements were shown in higher complexity questions (C3). Besides identifying item flaws there was noticeable improvement in knowledge and the participant's capacity to identify and correct errors. Item analysis is a useful tool for identifying subpar MCQs. It enabled us to identify badly structured MCQs and focused on refining them to raise the standard of the question bank. Hence the learning and performance of medical educators in the area of developing MCQs appear to be significantly improved by such faculty development workshops.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Omeprazole (Risek®) Use in Inpatient and Outpatient Departments: A Post-Marketing Surveillance Investigation

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ABSTRACT

Proton pump inhibitors (PPIs) are widely used for the treatment of acid-related gastrointestinal disorders. However, their overuse or inappropriate prescription can lead to adverse effects, increased healthcare costs, and development of antibiotic-resistant infections. **Objectives:** To ascertain whether the Omeprazole (Risek®)-PPIs prescription patterns by practitioners in the inpatient and outpatient departments of various healthcare facilities in Pakistan are in compliance with the therapeutic indications and to evaluate the safety profile associated with each therapeutic indication. **Methods:** A cross-sectional multicenter study was conducted for 4 months at various healthcare facilities inpatient and outpatient departments. A total of 1384 patients ≥ 18 years prescribed Omeprazole (Risek®) were enrolled while pregnant or lactating women, patients with chronic diarrhea, those with a history of Omeprazole allergic reaction, and with diagnosed malignancy of the GI tract were excluded. The drug use was determined based on the prescribed frequency, dosage, and duration of therapy with respect to each indication. **Results:** Of the total, 29.8% were already taking oral PPI or Histamine H2-Receptor Antagonists. The common indication for Omeprazole (Risek®) was Gastroesophageal Reflux Disease (GERD), followed by peptic ulcer. Mostly the drug was infused/injected in 40 mg dosage, once daily and for five days among 76.6% and 41.8%, respectively. Around 13.3% of patients experienced mild adverse events like flatulence, fever, vomiting, abdominal pain, constipation, diarrhea, nausea, rash, etc. Most off-label uses were observed in GERD concerning the duration of therapy (55.9%), prescribed frequency (19.7%), and dosage (5.9%). The Omeprazole (Risek®) treatment was also prescribed for stress ulcer prophylaxis and upper GI bleeding against the treatment protocol for the particular therapeutic indication. The adverse events were most frequent among patients with GERD, followed by NSAID-induced ulcers. **Conclusions:** This study provides clinical evidence on the Omeprazole (Risek®) use in concordance with the product label, in both inpatient and outpatient departments of Pakistan for various therapeutic indications.

INTRODUCTION

Proton pump inhibitors (PPIs) are commercially available since more than 30 years ago and have been the mainstay of treating upper gastrointestinal disorders[1]. Since then, they have proven to be valuable, safe, and effective agents for the management of a variety of acid-related disorders. Although members in this class act in a similar fashion, inhibiting active parietal cell acid secretion, there are slight differences among PPIs relating to their pharmacokinetic properties, metabolism, and their approved clinical indications[2]. PPIs are available in intravenous (IV) and

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oral forms (enteric-coated delayed-release, microencapsulated beads in a capsule or suspension, and unprotected drug with sodium bicarbonate). Currently, the IV PPI are approved by the US Food and Drug Administration (US-FDA) for treating patients who are unable to tolerate oral medications due to complicated erosive esophagitis, and in patients with Zollinger-Ellison syndrome with pathological hypersecretory states. In real life practices, the use of IV PPI is much more widespread [3]. PPIs are among the most frequently prescribed drugs globally. While they are highly cost-effective when used appropriately, studies across a wide range of populations continue to identify that they are prescribed without a clear indication in 50 to 70% of cases [4, 5]. One of the most frequently prescribed drug classes worldwide is that of proton-pump inhibitors (PPIs), which include Omeprazole. It has grown in popularity for off-label use in inpatient and outpatient settings, despite its primary indication being the treatment of GERD. It has a long history of effective treatment inside and outside hospitals. Omeprazole is increasingly used off-label despite being effective. When the frequency of hospitalizations brought on by adverse drug reactions were assessed, it was found that Omeprazole was the medication most frequently linked to hospital admission [6]. A drug's safety may also alter over time due to increased usage and alterations in patient characteristics. Therefore, a risk assessment is necessary. Reports on omeprazole abuse and irrational prescription of this medication can help to clarify this context. As a result, studies have documented the risks (adverse events (AEs)) of using Omeprazole, including changes in gastric proliferative tissue; increased levels of urea and creatinine cause acute interstitial nephritis[7, 8], which raises the risk of developing chronic kidney disease, a higher risk of asthma when gastroesophageal reflux is present, increased danger of contracting Clostridium difficile infection, reduced vitamin B absorption, cystic fibrosis-related steatorrhea, fracture with reduced calcium absorption, gynecomastia, anaphylactic reactions to Omeprazole, etc., [9]. Additionally, Omeprazole was listed as one of the drugs that may have contributed to the hospitalization in studies that assessed the frequency of hospital admission due to adverse drug events, suggesting that Omeprazole is frequently used outside of the recommended dosage range [5]. Off-label drug use refers to the use of medications for unapproved purposes. It typically affects polymedicated patients and serves as prophylactic gastric protection for some medications, including antimicrobials and non-steroidal anti-inflammatory drugs. This post-marketing surveillance investigation was designed to ascertain whether Omeprazole (Risek®) prescription patterns by practitioners in the inpatient and outpatient departments of various healthcare facilities in Pakistan are in conformity with the therapeutic indications.

METHODS

A cross-sectional multicenter study was designed to assess the conformity and concordance of the prescription of Omeprazole (Risek®) as per the product label, in various healthcare facilities of Pakistan. Before study initiation, ethical approval was obtained from the independent Ethical Committee of AEIRC [Ref# ERC/S20/P-004; Dated January 30, 2021]. Data were collected using purposive sampling technique. All patients ≥ 18 years reporting to and diagnosed by treating physicians for acid-related disorders prescribed Omeprazole (Risek®) were enrolled. Pregnant or lactating women, patients with chronic diarrhea, those with a history of Omeprazole allergic reaction, and with diagnosed malignancy of the GI tract were excluded. The prescription was considered non-compliant/off-label if any of these three criteria were met i.e. prescribed frequency, dosage, and duration of therapy (with respect to each indication in non-compliance with the marketing authorization). The treating physician that collected and submitted data used an electronic data capture system (Microsoft Forms) for this study. The required data were assembled as a patient registry, specifically designed electronic medical records at the study sites for the study. For sample size following formula was used at 50% proportion $N = z^2 p (1- p) / d^2$. Final sample size was n=384 with 20% attrition it was n=450. The data collected in June to September 2022. The final analysis presented in this study includes data from n=1384 patients. Each enrolled case was labeled with a specific identifier and the data confidentiality was retained. Patient demographic and clinical information, including age, gender, current medication history related to PPI or Histamine H2-Receptor antagonists use, concomitant drug consumed, and patient complaints, were registered. Omeprazole (Risek®) off-label and on-label use was determined based on the indication for which it was used, prescribed dosage, frequency, and duration of therapy given. The safety profile was also monitored, data regarding any adverse events reported, action taken to manage them, and clinical improvement in patient symptoms after treatment with Omeprazole (Risek®) was recorded. Data analysis was performed on SPSS Version 22.0, and all variables were evaluated for normality using the Shapiro-Wilk test. Continuous variables were expressed as mean ± standard deviation and categorical variables were described in frequencies and percentages. As the comparisons included categorical variables, the chi-square test was applied for the normally distributed data. A p-value < 0.05

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was considered significant for all significance tests applied.

RESULTS

For n=1384 cases analyzed, the mean patient age was 43.79 ± 13.63 years, with slightly more male patients (58.2%) than females (41.8%). It was found that 413(29.8%) patients were already taking oral PPI, and 106(25.67%) were consuming Omeprazole (Risek®). The patients mostly complained about heartburn 898(64.9%), followed by gastritis. GERD was the predominant indication for which the Omeprazole (Risek®) was infused or injected. Other details regarding the prescribed dosage, frequency, and duration of therapy are given in Table 1.

Table 1: Clinical characteristics (indications, dosage, frequency of Omeprazole (Risek®) IV, AEs) of inpatients and outpatients

Variables		n(%)
Already taking oral PPI or Histamine H2-Receptor Antagonists	No	971(70.2)
	Yes	413(29.8)
Drugs consumed by the patients (n=413)	Esomeprazole	119(28.81)
	Omeprazole	106(25.67)
	Pantoprazole	43(10.41)
	Famotidine	31(7.51)
	Rabeprazole	30(7.26)
	Lansoprazole	30(7.26)
	Dexlansoprazole	26(6.30)
	Ranitidine	15(3.63)
	Cimetidine	8(1.94)
	Others	5(1.21)
Concomitant drugs consumed	None	1055(76.2)
	Clopidogrel (Antiplatelet)	126(9.1)
	Digoxin (Cardiac Glycosides)	63(4.6)
	Clarithromycin (Macrolide)	53(3.8)
	Diazepam (Anxiolytic)	38(2.7)
	Ketoconazole (Antifungal)	31(2.2)
	Methotrexate (Antimetabolites)	13(0.9)
	Rifampicin (Antitubercular)	10(0.7)
	Tacrolimus (Immunosuppressant)	5(0.4)
	Phenytoin (Anticonvulsants)	2(0.1)
	Others	35(2.5)
Symptoms or patient complaints	Heartburn	898(64.9)
	Gastritis	456(32.9)
	Nausea Or Vomiting	414(29.9)
	Dyspepsia	403(29.1)
	Abdominal Pain	374(27.0)
	Dysphagia	230(16.6)
	Bloating Or Blenching	177(12.8)
	Blood In Stool (Melena)	38(2.7)
	Others	11(0.8)
Indication for infusion/injection Omeprazole	GERD	1024(74.0)
	Peptic Ulcer	387(28.0)
	Upper G.I Bleed	250(18.1)
	Stress Ulcer Prophylaxis	232(16.8)
	NSAIDs Induced Ulcers	221(16.0)
	Erosive Esophagitis	117(8.5)
	Helicobacter Pylori Infection	
	Zollinger-Ellison Syndrome	90(6.5)
Route of drug administration	IV Injection	504(36.4)
	IV Infusion	819(59.2)
	Both	61(4.4)
Prescribed dosage	20 mg	79(5.7)
	40 mg	1266(91.5)
	60 mg	35(2.5)
	120 mg	4(0.3)
Prescribed frequency	OD	1060(76.6)
	BD	288(20.80)
	TDS	36(2.6)
Duration of therapy (days)	1 Day	241(17.4)
	2 Days	120(8.7)
	3 Days	282(20.4)
	More Than 3 Days	579(41.8)
	SOS	162(11.7)
Adverse event(s)*	No	1200(86.7)
	Yes	184(13.3)
Symptoms	Flatulence	56(4.0)
	Fever	54(3.9)
	Vomiting	54(3.9)
	Abdominal Pain	54(3.9)
	Constipation	47(3.4)
	Diarrhea	46(3.3)
	Nausea	39(2.8)
	Rash	39(2.8)
	Dizziness	36(2.6)
	Tingling Feelings	36(2.6)
	Vertigo	35(2.5)
	Edema	34(2.5)
	Kidney Functions Abnormality	33(2.4)
	Headache	32(2.3)
	Others	60(4.3)
Action taken due to adverse event(s) (n=184)	No Action or Therapy Required / Transient Adverse Events	52(28.26)
	Therapy Required for Management of Adverse Events and Continuation of Omeprazole	59(32.06)
	Therapy Required for Management of Adverse Events and Discontinuation of Omeprazole	73(39.67)
Patient symptom(s) improved clinically after treatment with IV Omeprazole	No	53(3.8)
	Yes	1331(96.2)
Patients discharged on oral Omeprazole	No	90(6.5)
	Yes	1294(93.5)

*164 patients had single AE. Multiple cases with more than one AE were observed, patients with 2 AEs=18, 3 AEs=1, 4 AEs=1, and a total of 32 had all AEs

The off and on-label use was determined based on the prescribed frequency, dosage, and duration of therapy (Figure 1). Most off-label uses were observed in GERD cases in terms of therapy duration 572(55.9%), prescribed frequency 202(19.7%), and dosage 60(5.9%). The PPI treatment was also prescribed for stress ulcer prophylaxis (n=232; 100%) and upper GI bleeding (n=250; 100%) against the treatment protocol for the particular therapeutic indication.

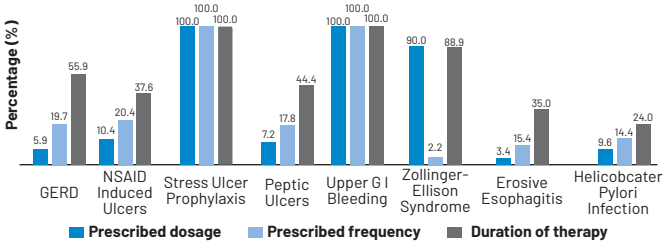

Figure 1: Off-label use of Omeprazole (Risek®) by physicians

The adverse events were most frequent among patients

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with GERD, i.e., 360(35.1%) AEs were observed among the patients prescribed Omeprazole (Risek®) for GERD, followed by NSAID-induced ulcers (Table 2).

Table 2: Adverse events with respect to indications

Adverse Events	Indications							
	GERD	NSAID Induced Ulcers	Stress Ulcer Prophylaxis	Peptic Ulcer	Upper G.I Bleed	Zollinger-Ellison Syndrome	Erosive Esophagitis	Helicobacter Pylori Infection
Headache	23(2.2)	13(5.9)**	7(3.0)	1(0.3)**	2(0.8)	1(1.1)	2(1.7)	2(1.9)
Diarrhea	30(2.9)	18(8.1)**	10(4.3)	3(0.8)**	2(0.8)**	1(1.1)	3(2.6)	3(2.9)
Constipation	30(2.9)	16(7.2)**	10(4.3)	2(0.5)**	3(1.2)*	2(2.2)	4(3.4)	4(3.8)
Abdominal Pain	28(2.7)**	15(6.8)**	12(5.2)	5(1.3)**	5(2.0)	4(4.4)	5(4.3)	2(1.9)
Flatulence	27(2.6)**	18(8.1)**	9(3.9)	10(2.6)	4(1.6)*	2(2.2)	3(2.6)	4(3.8)
Fever	25(2.4)**	16(7.2)**	11(4.7)	8(2.1)*	5(2.0)	3(3.3)	3(2.6)	3(2.9)
Vomiting	26(2.5)**	16(7.2)**	11(4.7)	6(1.6)**	5(2.0)	2(2.2)	6(5.1)	3(2.9)
Nausea	25(2.4)	14(6.3)**	7(3.0)	3(0.8)**	4(1.6)	2(2.2)	2(1.7)	2(1.9)
Rash	24(2.3)	13(5.9)**	9(3.9)	3(0.8)**	4(1.6)	1(1.1)	2(1.7)	2(1.9)
Edema	24(2.3)	13(5.9)**	8(3.4)	1(0.3)**	2(0.8)	1(1.1)	2(1.7)	2(1.9)
Dizziness	25(2.4)	13(5.9)**	8(3.4)	1(0.3)**	3(1.2)	1(1.1)	2(1.7)	3(2.9)
Tingling Feelings	26(2.5)	15(6.8)**	8(3.4)	2(0.5)**	3(1.2)	1(1.1)	3(2.6)	3(2.9)
Vertigo	23(2.2)	15(6.8)**	8(3.4)	1(0.3)**	2(0.8)*	1(1.1)	2(1.7)	2(1.9)
Kidney Functions Abnormality	24(2.3)	13(5.9)**	7(3.0)	1(0.3)**	2(0.8)	1(1.1)	2(1.7)	2(1.9)
	360	208	125	47	46	23	41	37

*p<0.05; **p<0.01 is considered statistically significant

DISCUSSION

In our study, off-label use of Omeprazole (Risek®) has been reported in both inpatient and outpatient departments. In this research, GERD and peptic ulcer disease were the most frequently reported off-label indications. Omeprazole (Risek®) was also used for other indications, such as upper GI bleeding (18.1%) and stress ulcers (16.8%), which were non-compliant with the marketing authorization (Table 1). Our findings are consistent with other published studies regarding the over-prescription of PPIs[5]. These authors also discovered that doctors did not follow the consensus statements because they overprescribed PPIs without fully evaluating the impact of anti-H2 agents, did not adequately reevaluate the need for continuing PPI treatment, and were not sufficiently persuaded of the benefits of stopping drugs that aggravated reflux. An in-hospital retrospective study of surgical inpatients from the Netherlands found 46.6% of cases of non-compliance with guidelines, with overprescribing accounting for 93.1% of these [10]. Similarly, an Italian study reported that the off-label use of medications is widespread in the intensive care environment. PPIs account for the highest ratio, i.e., the off-label use observed in intensive care units is as high as 55% [11]. Likewise, Ali *et al.*, documented inappropriate prescribing of PPIs among 54.7% of cases [5]. Other studies have examined the underlying justification for PPI prescriptions and their continued use [12, 13]. Despite educational and stewardship strategies, there are frequently ambiguous justifications and low compliance with rules[14, 15]. The most frequent justifications for long-term PPI use were stress ulcer prophylaxis, improper treatment of dyspepsia, and prophylaxis for low-risk patients taking NSAIDs or corticosteroids (in secondary care) [16]. Healthcare providers should monitor patients closely and assess their response to treatment with Omeprazole (Risek®). Patients should also be informed of the potential risks associated with using Omeprazole (Risek®) off-label and encouraged to report any concerns or side effects they may experience. Although we observed that 96.2% of patients clinically improved after treatment with IV Omeprazole, 93.5% were discharged on oral Omeprazole, and no serious adverse events were reported (Table 1). Minor adverse events were reported in 13.3% of cases, the most common being flatulence (4%), followed by fever, vomiting, abdominal pain, etc. Moreover, with reference to the most frequent off-label use and associated AEs, these adverse events were also most frequent among patients with GERD, followed by NSAID-induced ulcers. Therapy was required to manage adverse events and discontinuation of Omeprazole among 73(39.67%) patients. Although several studies report potential adverse effects associated with long-term PPI use, their relevance is unclear, and most of them are based on low-grade evidence[17, 18]. However, caution should be exercised when prescribing this medication due to potential adverse events. Clopidogrel was among the most frequently used concomitant medication in the studied patients, i.e., 126(9.1%) (Table 1). A major concern is linked to the drug interactions associated with the use of Clopidogrel and Omeprazole; it significantly accelerates

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the platelet reactivity index [19, 20]. Individuals who use PPIs and clopidogrel concurrently may have an elevated risk of major adverse cardiovascular events (MACE) but not of mortality, according to several systematic reviews and meta-analyses. Two meta-analyses examining the interactions between distinct PPIs and clopidogrel did not establish any direct links to worse CV outcomes [21]. Another systematic review, including 16 observational studies (183,546 participants) and 6 randomized controlled trials (RCTs) with 6930 people each, revealed no statistically significant differences between the PPI groups and the non-PPI groups receiving dual antiplatelet therapy (DAPT) in the incidences of MACEs, MI, and all-cause mortality [22]. The guidelines greatly vary on the concomitant use of PPIs and DAPT. Smaller RCTs, numerous meta-analyses, and observational studies have offered mixed evidence regarding the effectiveness of this regimen[23].

CONCLUSIONS

Omeprazole (Risek®), according to the study's findings, is widely used for gastrointestinal conditions such as acid reflux and peptic ulcers. However, most of the prescriptions did not adhere to the marketing authorization. For instance, administering Omeprazole for longer than suggested durations or for diseases like upper GI bleeding and stress ulcers would be against the prescribed course of care for the particular therapeutic indication. Moreover, with reference to the most frequent off-label use and associated AEs, adverse events were also most frequent among GERD patients.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

A Randomized Controlled Trial on Zinc Supplementation for Prevention of Acute Respiratory Infections in Infants

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ABSTRACT

There is little evidence that zinc supplementation will be effective in treating acute respiratory infection (ARI), but it may prevent respiratory infections when taken in conjunction with antibiotics. **Objective:** To assess the zinc supplementation for acute respiratory infection prevention in infants. **Methods:** A randomized controlled trail was conducted on 120 acute respiratory infected infants in Pediatric Unit, Qazi Hussain Ahmad Medical Complex, Nowshera from 1st January 2022 to 30th June 2022. Infants having 6-14 months of age with acute respiratory infections were enrolled. Infants were allocated to two groups: Group-I infants receiving Zinc (20 mg/5 mL) in terms of Zinc sulphate (N=60) and Group-II infants taking syrup (Placebo) (N=60). **Results:** Of the total 220 episodes, the frequency of episodes in zinc and placebo group was 106 and 114 respectively, accounting for 7.78 and 8.68 per child year after 5 months. Based on GEE regression model observed an insignificant decrease of 8% (Adjusted IRR 0.89, 95% CI 0.79-1.01) in episodes of acute respiratory infections in zinc group as compared to placebo group. However, acute respiratory infections episodes (Adjusted IRR 0.36, 95% CI: 0.25-0.35) decreased by 60% in zinc group. Zinc supplementation reduced the acute respiratory days significantly by 14% (Adjusted RR 0.83, 95% CI: 0.76-0.92). **Conclusions:** Prophylactic zinc supplementation for two weeks decreased acute lower respiratory tract infection morbidity in apparently healthy infants and improved the infant's recovery from acute respiratory infections and reduced their hospitalization as compared to placebo group.

INTRODUCTION

Zinc is an essential micronutrient in humans that promotes protein synthesis, cell differentiation, and immune system function [1]. Phytates, which limit zinc absorption and utilization, are commonly found in staple foods in many countries such as Thailand and Pakistan [2]. It has been shown that zinc deficiency is associated with pediatric illnesses in multiple randomized controlled trials [3]. Acute respiratory infections (ARIs), particularly acute lower respiratory infections (ALRIs), are among the major causes of children mortality [4-6]. Zinc deficiency is estimated to be responsible for 118,000 fatalities in children under the age of five in underdeveloped nations [7]. Recent studies and meta-analyses have shown that zinc supplementation, both therapeutic and preventative, lowers the length, severity, and frequency of ARIs [8, 9]. In fact, the incidence of stunting in these situations is frequently used to evaluate the amount of zinc deficiency in a community [10]. Zinc influences both non-specific and specific immune activity at several levels. Zinc influences the integrity of the epithelial barrier as well as the activity of neutrophils, natural killer cells, monocytes, and macrophages [11]. As a result, zinc has the potential to be effective in the

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prevention, control, and treatment of infections. The World Health Organization (WHO) and the United Nations Children's Fund advised zinc supplementation for up to two weeks for the treatment of acute diarrhea based on data from many randomized controlled studies and meta-analyses [12]. Similarly, another study investigated the zinc supplementation effect on the frequency and severity of children's respiratory illnesses. The actual countrywide incidence of zinc deficiency in Pakistan is unclear at this time. It is projected that 41.6% of the population is at danger of not getting enough zinc [13]. The high incidence of zinc shortage in poor nations can be ascribed to a zinc malabsorption and lack of zinc-rich foods. Zinc may be found in a variety of meals; however, it is found in higher amounts in fruits, lower concentrations in tubers, vegetable, animal source foods and refined cereals. In contrast, the phytate, a powerful mineral chelator that includes zinc, is commonly present in cereal grains, nuts, and seeds [14]. Despite the fact that zinc deficit is common in Pakistan, no prior research on the zinc supplementation benefits on Pakistani ARI children with have been conducted. The purpose of this study was to investigate the zinc supplementation affected the acute respiratory tract infections treatment in Pakistani infants.

METHODS

A randomized controlled trail was conducted on 120 acute respiratory infected infants in Pediatric Unit, Qazi Hussain Ahmad Medical Complex, Nowshera from 1st January 2022 to 30th June 2022. Infants having 6-14 months of age with acute respiratory infections were enrolled. Infants with a known history of chronic illnesses, such as congenital heart diseases, chronic liver or renal diseases, and immune deficiency or malignancy were excluded. Sample size was estimated based on following criteria: statistical power 80%, α=0.05, type-I errors 0.01, Thus, 104 infants (52 in each group) were required for a 14% decrease in the incidence of ARI (0.05 and power 80%). Taking 5% attrition into account, the final sample size was 120. Consecutive sampling technique was used. Infants were allocated to two groups: Group-I infants receiving Zinc (20 mg/5 mL) in terms of Zinc sulphate (N=60) and Group-II infants taking syrup (Placebo) (N=60). Cessation of ARI (starting period to disappearance of tachypnea, hypoxia, and abnormal pulmonary auscultation) was the primary outcome. Clinical features and hospitalization duration were secondary outcomes. Prior to medication trial, baseline data, detailed medical history, physical examination, and clinical assessment were done and data were recorded. Clinical glass thermometer was used for measuring the axillary temperature. Pulse oximetry was used for measuring the respiratory rate and oxygen saturation till patients were discharged. Patients with axillary temperature ≥37.5°C were defined to have fever. Flame atomic absorption spectrometry was used for the measurement of zinc serum levels at baseline, seven days of supplementation, and before discharge. Data analysis were done in SPSS version 27.0. Mean and standard deviation expressed the quantitative variables whereas categorical parameters were presented as frequencies and percentages. Post-stratification Chi-square test was used for the zinc supplement comparison in both groups. Serum zinc levels from baseline were assessed by paired t-test by taking 95% confidence interval and 5% level of significance.

RESULTS

Of the total 220 episodes, the frequency of episodes in zinc and placebo group was 106 and 114 respectively, accounting for 7.78 and 8.68 per child year after 5 months. Based on GEE regression model observed an insignificant decrease of 8% (Adjusted IRR 0.89, 95% CI 0.79-1.01) in episodes of acute respiratory infections in zinc group as compared to placebo group. However, acute respiratory infections episodes (Adjusted IRR 0.36, 95% CI: 0.25-0.35) decreased by 60% in zinc group. Zinc supplementation reduced the acute respiratory days significantly by 14% (Adjusted RR 0.83, 95% CI: 0.76-0.92). Of the total 120 infants, 78 (65%) were male and 42 (35%) were females. Chest in-drawing, sore throat, and nasal flaring were the prevalent clinical features among acute respiratory infections infants. There was no significant effect of zinc supplementation on the prevalence of acute respiratory infections. Mean concentration of Zinc concentrations on admission in both groups were statistically significant (Group-I 74.8 ± 20.2 mg/dL versus 75.9 ± 21.9 mg/dL in placebo; p=0.835). Serum zinc concentrations at the end of study in Group-I was substantially higher (112.7 ± 28.8 mg/dL) than Group-II (88.3 ± 20.7 mg/dL; p<0.001). Comparing to baseline, mean serum zinc concentration was significantly higher in both groups: mean gain in Group-I and Group-II was 37.8 mg/dL (95% CI: 25.6 to 50.8 mg/dL) and 12.6 mg/dL (95% CI: 3.8 to 21.6 mg/dL) respectively. Table 1 represents the baseline and demographic details of infants.

Table 1: Demographic details of infants

Parameters	Group-I (N=60)	Group-II (N=60)	p-value
Gender N (%)			
Male	46 (76.7)	32 (53.3)	0.346
Females	14 (23.3)	28 (46.7)	
Age (months)			
6-10	21 (35)	26 (43.3)	0.894
11-14	39 (65)	34 (56.7)	
Weight (Kg)	11.3 (4.2)	10.4 (2.3)	0.314
Height (cm)	80.4 (13.6)	79.3 (10.7)	0.492

Infant's clinical features are shown in Table 2.

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Table 2: Clinical features of infants

Characteristics	Group-I (N=60)	Group-II (N=60)	p-value
Temperature (°C)	38.3	38.4	0.572
Respiratory rate (bpm)	50	49	0.262
Pulse (bpm)	164	170	0.217
SBP (mm Hg)	107	106	0.673
DBP (mm Hg)	63	66	0.225
Oxygen saturation %	95.2	94.5	0.836
Rhinorrhea N (%)	58 (96.7)	56 (93.3)	1.000
Sore threat N (%)	54 (90)	54 (90)	0.912
Diarrhea N (%)	8 (13.3)	6 (10)	0.991
Vomiting N (%)	13 (21.7)	17 (28.3)	0.835
Chest in drawing N (%)	57 (95)	58 (96.7)	1.000
Nasal flaring N (%)	53 (88.3)	56 (93.3)	1.000
Hemoglobin g/dL	11.8	11.4	0.372
Hematocrits (%)	35.6	34.8	0.283
Platelet ×103/mm3	384.6	407.2	0.537

Effect of zinc supplementation on the ARI duration and incidence in the study group is shown in Table 3.

Table 3: Effect of zinc supplementation on the ARI duration and incidence in the study group

Outcome	Zinc group	Placebo group	Adjusted IRR
Child year	52.8	49.6	-
Incidence of ARI	7.78	8.68	0.89 (0.79-1.01)
Incidence of AURI	7.1	7.1	0.9 (0.87-1.12)
Days# with ARI	11.2 (6.5)	14.6 (7.9)	0.7 (0.76-0.93)
Days# per episode ARI	3.5 (1.5)	3.7 (1.1)	0.7 (0.77-0.93)

DISCUSSION

The present study mainly focused on the assessment of Zinc supplementation for the prevention of acute respiratory infections in infants and found that compared to placebo, zinc supplementation significantly improved acute respiratory infection recovery and reduced hospitalization duration. Acute respiratory infection's infants were significantly improved in terms of fever, chest-in-drawing, and tachypnea, while restoring normal oxygenation, disappearing wheezes, and normalizing body temperature were improved by zinc intake. Supplementation of zinc bisglycinate, as zinc bisglycinate, was safe and well tolerated. Evidence regarding the zinc supplement possible impact on ARI adjuvant treatment among infants are sparse and contentious, due to the zinc formulas, and assessments of outcome. The current study findings are consistent with other RCT trial's findings according to which zinc supplementation shortened hospital stay and dramatically enhanced recovery from ARI and severe pneumonia [15, 16]. Another study reported that 20 mg/day of zinc acetate supplementation could be beneficial for severe ARI infants. They concluded that zinc supplementation dramatically decreased fever duration and increased recovery rates in critically sick individuals [17]. A previous study by Adhikari *et al.*, found that recovery time from severe ARI increased with zinc supplementation of 20 mg/day or zinc acetate in turn reducing the hospitalization duration. Another research found no statistical significance in zinc supplementation for ARI among infants [18]. Another study reported that zinc sulphate (20 mg/day) failed to demonstrate positive significance of therapy in terms of hospitalization duration. Sánchez *et al.*, found that 20-40 mg/day dose of zinc gluconate supplementation had no significant effect in terms of symptom's recovery and hospitalization duration. In contrast, the risk for ARI readmission increased with zinc supplements [19]. Sharma *et al.*, investigated the prevalence and risk factors of anemia and zinc deficiency among 4–6-year-old children zinc and found that sulphate supplementation (20 mg/day) effectiveness in severe ARI Indian infants [20]. The trial failed to show that adjuvant treatment had substantial clinical benefits or reduced hospitalizations time. Chao *et al.*, [21] conducted their study on Taiwan children and discovered that providing indigenous zinc gluconate supplementation (20-40 mg/day) had no therapeutic benefit for symptom resolution or hospitalizations length. Conversely, ALRI readmission risk was found higher among children who were given zinc supplements. The differences between our findings and those of other writers might be attributable to the varying types and amounts of zinc supplements used. In the current investigation, the zinc dose was roughly suggested daily limit (2-3 times) for the zinc insufficiency treatment. Inorganic zinc is associated with an increased risk of gastrointestinal adverse effects [22]. A previous study by Baqui *et al.*, suggested that organic zinc compound had higher absorption than non-organic [23]. An earlier study by Brown *et al.*, [24] found that organic zinc had lowered bioavailability and is effective and safe procedure employed to infants of zinc bis-glycinate. Zinc's chemical form impacts its bioavailability, and hence the quantity absorbed and assimilated from the intestines after digestion. Zinc can be present as organic complexes in meat and in inorganic salts in plant meals [25-27]. Additionally, the use of amino acid chelates reduces the occurrence of symptoms such as epigastric discomfort, nausea, stomach cramps, and vomiting, and diarrhea [28]. The process by which zinc supplementation alleviates ARI symptoms is uncertain. In theory, zinc is required for cell proliferation and protein synthesis, and it is crucial for respiratory cell integrity [29, 30]. In respiratory infections infants, cellular damage and inflammation at airway might be worsen by zinc deficiency [31]. Based on these findings, contributes to better clinical outcomes, it is reasonable to believe that elevating serum zinc levels during ARI. Thai children with an estimated risk of zinc insufficiency greater than 40% may benefit from zinc supplementation, not only

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to boost dietary micronutrient intake, but also to promote illness recovery.

CONCLUSIONS

Prophylactic zinc supplementation for two weeks decreased acute lower respiratory tract infection morbidity in apparently healthy infants aged 6 to 14 months during follow-up. Also, the present study indicated that zinc supplementation improved the infant's recovery from acute respiratory infections and reduced their hospitalization as compared to placebo group.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Association between Myopia and Glaucoma; A Cross-sectional Study

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ABSTRACT

Myopia is a major cause of worldwide avoidable blindness and its prevalence increasing rapidly. **Objective**: To investigate the prevalence of glaucomatous optic nerve damage with various myopia levels as well as the relationship between myopia and glaucoma. **Methods**: A multi-centered cross-sectional study was conducted from January 2022 to July 2022. 250 individuals between the ages of 40 and 65 were recruited using non-probability purposive sampling technique. Mild, moderate and severe degree of myopia who had never had any surgery were included. All subjects underwent refraction and the optic disc ratio was assessed by slit lamp biomicroscopy, perimetry was performed to evaluate the visual field defects and IOP was determined using air puff tonometer. Frequency of glaucoma indicated by presence of visual field defects, glaucomatous optic disc. SPSS software was used for data analysis. **Results**: 145 (58%) of the 250 total subjects were female and 105(42%) were male. 67 (26.8%) people had refractive errors of mild myopia up to 3D. While 85 (34%) had a severe degree of myopia (refractive error greater than 6D) and 98 (39.2%) had a moderate degree. No intragroup's intraocular pressure showed a significantly distinct configuration. Age-related VF anomalies (a larger blind region, a vertical cup to disc ratio, and an unjustified defect) were associated with both glaucoma and high myopia. Findings from the study indicated that glaucoma risk increased for those with high myopia (p=0.001). **Conclusion**: High myopia is strongly associated with glaucomatous changes and a high prevalence of optic disc damage.

INTRODUCTION

Glaucoma is the most common cause of permanent blindness in the world [1]. Even if individuals with visual field anomalies are not aware of their diagnosis, it can have a negative influence on their quality of life [2,3]. The most prevalent type of the disease is POAG in various populations [4].The main therapy objective of therapy is to lower the IOP which cause no further glaucomatous changes [5, 6]. Although the pathophysiology of glaucoma is currently unknown, genetic and environmental factors are likely to have an impact on it [7, 8]. Therefore, the discovery of new risk factors might enable earlier and more thorough screening of populations at risk. Additionally, it might shed light on the pathophysiology of the disease [9]. Myopia is the most typical type of vision impairment that affects people globally [10-12], and in recent decades, its incidence has gone up dramatically, especially in Asian countries [13-15]. There are several explanations for the rising prevalence of myopia, including more study and near-work time, decreased outdoor time, greater education levels, and genetic factors [16-19]. Iris colour and

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myopia development are also correlated [20]. Numerous ocular pathologies, such as cataracts [21] and retinal detachment [22] have been linked to high myopia (6 D). Myopia may or may not be a risk factor or a predictor for the initial onset and progression of glaucomatous optic nerve injury, according to the results of earlier investigations [23-25]. The optic nerve head (ONH), a structure in the posterior ocular fundus, mediates the entry and exit of the retinal blood vessels as well as the ejection of the retinal ganglion cell axons. It is located 4-5 mm nasally and somewhat superiorly from the fovea in emmetropic eyes (mean disc-fovea angle) [26, 27]. Bruch's membrane (BM), the choroid, and the peripapillary scleral flange, respectively, constitute the inner, middle, and external layers of the ONH canal anatomically [28]. The phrase "optic disc" describes the entire area, including the lamina cribrosa at its base, and can be used to describe the size and shape of the structure. The average inter-individual variability in optic disc size among Caucasians is 1:7 [29]. The optic disc in extremely myopic eyes enlarges with longer axial length or greater myopic refractive error, starting at a cut-off value of roughly eight diopters or an axial length of about 26.5 mm [30]. The size of the disc is likely not a determinant in the development of glaucoma in eyes that are not severely myopic, as there are typically no noticeable disc size differences between primary and secondary open-angle glaucoma groups [31]. A greater incidence of glaucomatous optic neuropathy is associated with the size and existence of a secondary macrodisc in eyes with severe myopia [32]. This cross-sectional study's objectives were to assess the relationship between myopia and glaucoma as well as the prevalence of glaucomatous optic nerve injury among myopic individuals. The findings of this study may help determine whether or not myopia indicates a significant risk for glaucoma, which is the primary cause of permanent blindness worldwide. Even if patients are ignorant of their visual impairment, myopia has a severe impact on their quality of life.

METHODS

A multi-centered cross sectional study was conducted from January 2022 to July 2022. 250 subjects between the ages of 40 and 65 were recruited using a non-probability purposive sampling technique. With the support of the Raosoft sample size calculator, the sample for this study has been estimated. Mild (up to 3D) moderate (3D to 6D) and severe degree (more than 6D) of myopia who had never had a cataract or refractive surgery were included. This study omitted pathological myopia, secondary myopia, ocular illnesses (amblyopia, strabismus, congenital ocular disease), and history of ocular interventions (LASIK, cataract surgery). Patients whose IOP was greater than 40 mm Hg were excluded from this study. All subjects underwent visual acuity assessment, refraction evaluation and slit lamp biomicroscopy examination. In addition tonometry and perimetry was also performed. The visual acuity of each individual was tested using a logMar chart which is a standardized chart used to test visual acuity. Then perform a refraction analysis (objective and subjective). To achieve the best corrected visual acuity, objective refraction was performed using an auto refractometer in conjunction with subjective refraction. auto-refractometer, which is a computerized instrument that measures the refractive error of the eye without any input from the patient. Subjective refraction was performed by asking the patient to choose between different lenses to obtain the best possible visual acuity. A slit lamp biomicroscopy to examine the anterior and posterior segments of the eye in details. Its was also used to evaluate the optic disc ratio and identify glaucomatous optic discs. Visual field abnormalities were assessed using perimetry. Intraocular pressure (IOP) was measured using an air puff tonometer. The data were compiled using a self-structured proforma, and SPSS software was used for descriptive statistics and chi square analysis. A p-value of 0.05 or less was regarded as significant.

RESULTS

A multi-centered cross sectional study was conducted from January 2022 to July 2022. 250 people between the ages of 40 and 65 were recruited using a non-probability purposive sampling technique. Age distribution was among 5 groups (Figure 1) as follow 41-45 years, 46-50 years, 51-55 years, 56-60 years and 61-65years.

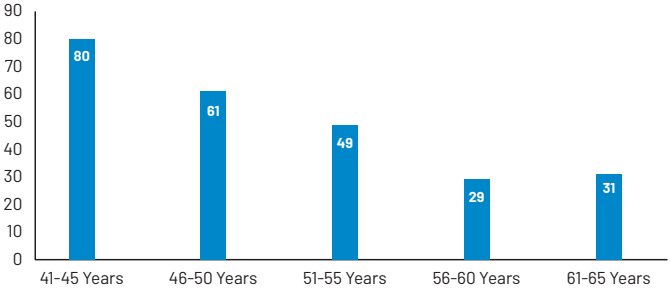

Figure 1: Age Distribution

In this study, 145(58%) of the 250 total subjects were female and 105(42%) were male (Figure 2).

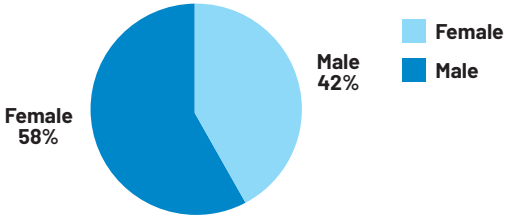

Figure 2: Gender Distribution

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In current study, 67 (26.8%) people had refractive errors of mild myopia up to 3 D. While 85 (34%) had a severe degree of myopia (refractive error greater than 6D) and 98 (39.2%) had a moderate degree (Figure 3).

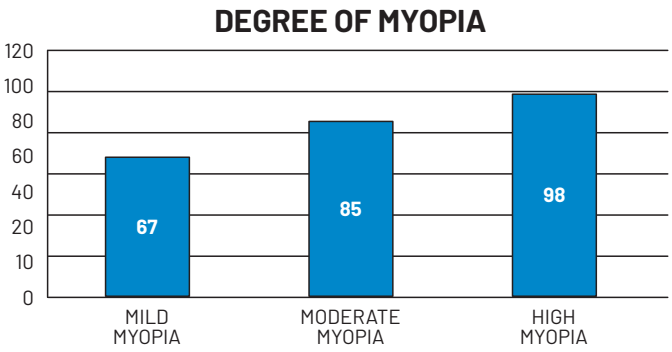

Figure 3: Degree of Myopia

According to the present study, frequency of glaucoma, as indicated by presence of visual field abnormalities, glaucomatous optic disc and may or may not raise IOP. Chi-square statistics were used to examine degree of myopia and glacuomatous changes. There was a significant relationship at 5% significant level between high myopia and glacuomatous changes of respondents (Table 1).

Table 1: Degree of Myopia and Glaucoma Association (Optic Disc Enlargement, visual field defects and raised IOP)

Degrees of myopia	Optic Disc Enlargement	Visual Field Defects	Raised IOP	p-value
Mild Myopia	5	2	6	0.13
Moderate Myopia	53	29	48	0.06
High Myopia	91	51	85	0.001

Older age was linked to both glaucoma and high myopia-related VF abnormalities (a larger blind area, a vertical disc ratio and an unidentified defect). According to study findings, people with high myopia were more likely to get glaucoma (p 0.001).

DISCUSSION

The latest findings are consistent with significant population-based research on myopia and glaucoma from decades previously. According to the BMES [33], glaucoma has been connected to the development of matched optic disc cupping with rim thinning (cup-to-disc ratio 0.7, or cup-to-disc asymmetry 0.3), as well as detectable visual field loss on automated perimetry. The most recent findings concur with significant population-based research on glaucoma and myopia that were done decades ago. The development of matched optic disc cupping with rim thinning (cup-to-disc ratio 0.7, or cup-to-disc asymmetry 0.3) and detectable visual field loss on automated perimetry have both been associated with glaucoma, according to the BMES [33]. According to the Tajimi Study in Japan and the Aravind Comprehensive Eye Survey in India, there is a link between POAG as evaluated by a thorough ophthalmologic exam and myopia greater than one degree [34, 35]. According to the BES in China [33], extremely high myopia (higher than 6 D), the onset of glaucomatous optic nerve, anomalies of the visual field, and increased IOP have all been connected. The Rotterdam Eye Study in the Netherlands found a connection between adverse myopia greater than 4 D and glaucomatous visual field loss [36, 37]. The findings of the present study suggest that defined to high myopia may be an indicator of risk for glaucoma, while low to moderate myopia may not have a significant impact on glaucoma. If myopia has been categorised as low to moderate myopia and marked or high myopia after just a myopic refractive error of 6 diopters. The results of the current study are consistent with a 30 000-person eye survey undertaken in Malmö before the Early Manifest Glaucoma Experiment. According to the Malmö Eye Survey [38], as myopia increased, so did the prevalence of glaucoma. At initial intraocular pressure levels, the relationship between myopia and glaucoma was strong, but it gradually weakened as intraocular pressure climbed. People with high myopia may need more frequent eye health management because they may be more susceptible to glaucoma and optic nerve damage. Individuals with high myopia should undergo thorough eye exams frequently to check for any warning signs of optic nerve damage or glaucomatous changes.

CONCLUSIONS

High myopia is strongly associated with glaucomatous changes and a higher prevalence of optic disc damage compared to low or moderate myopia.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Awareness about Knowledge, Attitudes, and Preventive Practices related to COVID-19 at a Public Sector University of Larkana

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ABSTRACT

The existence of the COVID-19 lethal virus highlights the urgent need to create a comprehensive awareness campaign for implementing infection control methods to lower the disease prevalence of this rapidly spreading infection. **Objective:** To determine the level of awareness about knowledge, attitudes, and preventive practices related to COVID-19 among faculty members at a medical university in Larkana. **Methods:** A descriptive cross-sectional study was conducted on 284 participants of any age group and both genders by using a simple random sampling technique. Data analysis was performed by using the Statistical Package for Social Sciences. Categorical data were presented in the form of frequency and percentages, while, continuous data were shown in the median and interquartile range. **Results:** The results demonstrated that 66.2% were male, and almost half, 49.3% of the participant's age group was 31-40 years. 94% of the participants had good knowledge, 67% had a good attitude, and 88% had good preventive practices, 69% believed that lack of awareness could cause difficulty in halting the spread of COVID-19. Social media (61.6%) followed by friends and family (24.3%) were the first sources to learn about the disease. **Conclusions:** Most of the respondents had good knowledge, attitude, and practice of COVID-19. Social media and other online platforms were the participants' major information sources.

INTRODUCTION

In December 2019, several unique coronavirus pneumonia cases were reported in Wuhan and soon spread quickly throughout the world. The disease was labeled Coronavirus disease 2019 (COVID-19). Earlier in 2020, World Health Organization (WHO) named this novel virus as "Severe Acute Respiratory Syndrome Coronavirus-2" (SARS-CoV-2) on February 11 [1]. It was crucial for the clinicians to recognize the typical clinical presentation of this new disease. It exhibits symptoms like abrupt onset of fever, dry cough, myalgia, fatigue, and dyspnea [2]. Some of the patients may develop multi-organ failure including ARDS, shock, kidney injury, liver dysfunction, cardiac injury, severe metabolic acidosis, bleeding and coagulation dysfunction [3]. WHO has labeled it a public health emergency and called for coordinated action in order to halt its rapid spread [4]. The virus is believed to be highly contagious and spreads quickly through respiratory droplets from infected individuals, or contact with contaminated objects and surfaces, which raises the frequency of new cases and fatalities [5]. Elderly and those having any other chronic health conditions were shown to be more at risk for increasing severity [6]. Data from previous studies have shown that compared to Asian lineage avian influenza (H7N9), the middle east respiratory syndrome (MERS),

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severe acute respiratory syndrome (SARS), and the total case fatality rate for COVID-19 is lower and ranges from two and five percent globally [7]. Dealing with the pandemic has become a key issue and challenge due to scant knowledge about the epidemiological evidence of the disease, such as transmission dynamics, epidemic doubling time, and reproductive frequency [8]. All the health care agencies including WHO have taken specific initiatives to protect the communities and healthcare professionals during the outbreak time and asked for transparent sharing of knowledge and provided support on the ground. It was intended that highly contagious and virulent variants needed to shift from purely therapeutic to preventive practices by the public. This required educating, engaging, and motivating the people to actively participate for better preparedness in dealing with the pandemic, ultimately reducing the overall population's vulnerability. Recent studies have shown that individual behaviors can dramatically reduce COVID-19 morbidity and mortality when individuals engage in preventive behaviors, such as personal hygiene practices and maintaining social distance [8]. Furthermore, harmful behaviors, false beliefs, and misconceptions may worsen its disastrous effects. Evidence from earlier epidemics, MERS and SARS, has demonstrated that evaluation of knowledge, attitudes, and practice aids in the identification of misconceptions, restrictions of misleading information, and disinformation connected to epidemics and also aids in the development of effective methods to minimize its harmful impacts. By gaining more knowledge about the disease transmission, raising awareness of preventive practices, dispelling misconceptions and misinformation, and cultivating good attitudes toward adopting healthy hygiene measures can all lead to the successful implementation of preventive measures that may help to lessen the harmful consequence of lethal viruses [9]. Hence, this study was conducted to determine the level of awareness about knowledge, attitudes, and preventive practices related to COVID-19 among faculty members at a medical university in Larkana.

METHODS

This cross-sectional study was carried out at Shaheed Mohtarma Benazir Bhutto Medical University (SMBBMU), Larkana, Sindh, Pakistan. The target population was faculty working in SMBBMU, Larkana. The study duration was five months from December 2021 to April 2022 after approval of Ethical Review Committee (ERC). The sample size was determined by using OpenEpi software based on the proportion formula with a 95% confidence interval by taken 50.2% [10], based on 1000 population. A simple random sampling technique was used to recruit the participants in the study. All the teaching faculty of entire departments, of any age group and both genders, working in the SMBBMU Larkana were included in the study. While, non-teaching staff, assistants, and those not willing to take part in the study were excluded from the study. An adopted, validated and self-administered questionnaire was used for data collection, comprised of 05 sections such as Demographic, Knowledge, Perception Attitude, and Practice [10]. The cutoff scoring for knowledge was 1 to 6 as "Poor Knowledge", 7 to 10 as "Moderate Knowledge" while 11 to 14 as "Good Knowledge"; for attitude, the benchmark was 1 to 4 "Not Good" whereas 5 to 7 as "Good" attitude; while for practice, the cutoff score of 1 to 11 as "Not Good" and 12 to 18 were considered as "Good" practice. Data analysis was performed by using the SPSS version 23.0. Normality of continuous variables was evaluated by using histogram and Shapiro Wilk test. Median and interquartile range (IQR) were calculated and displayed for non-normal distributed variables. Data were also analyzed in frequency and percentages for all qualitative variables.

RESULTS

Table 1 represents the awareness and source of information on COVID-19 among study participants. When faculty members were asked about the outbreak of COVID-19, 260 (91.5%) responded positively that they have ever heard about the COVID-19 outbreak. Whereas 24 (8.5%) were unaware of it. Participants were asked about where they have heard about COVID-19 for the first time. 175 (61.6%) responded that they had come to know from social media, Facebook, Twitter, Instagram, newspapers, etc. followed by friends, relatives, family, or neighbors (24.3%), while 35 (12.3%) were known through the television and radio services.

Table 1: Awareness and Source of Information on COVID-19 among Study Participants

Questions	Frequency (%)
Have you heard about COVID-19?	
No	24 (8.5)
Yes	260 (91.5)
How did you first become aware about COVID19?	
Family/ Relative/ Friends/ Neighbours	69 (24.3)
Social Media/ Face book/ Twitter/ Instagram/ Newspaper etc.	175 (61.6)
Television/ Radios	35 (12.3)
Others	5 (1.8)

Table 2 reveals the participants' responses to the knowledge statements against COVID-19 with their correct and incorrect frequencies and proportions. Majority of the respondents replied correctly in all statements. A higher proportion of incorrect responses were noted in statement-10 (39.8%) followed by statement-2 (25.4%) and statement-1(22.2%).

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Table 2: The Participants' responses to the Knowledge statements towards COVID – 19

Statement(s)	Correct n (%)	Incorrect n (%)
Is COVID-19 viral disease?	221 (77.8)	63 (22.2)
Is COVID-19 an illness that is carried through water?	212 (74.6)	72 (25.4)
COVID-19 can be spread by direct contact with an infected person.	260 (91.5)	24 (8.5)
Do you know incubation period of COVID19?	262 (92.3)	22 (7.7)
COVID-19 symptoms include shortness of breath, coughing, and fever.	276 (97.2)	08 (2.8)
Other symptoms of COVID-19 may include diarrhea, sore throats, and muscle ache.	275 (96.8)	09 (3.2)
Individuals who have underlying chronic conditions are more likely to get sick.	278 (97.9)	06 (2.1)
Does washing your hands with soap and water assist to stop the spread of COVID-19?	278 (97.9)	06 (2.1)
A good COVID-19 preventative method is to use a face mask.	275 (96.8)	09 (3.2)
Is there now a treatment for COVID-19?	171 (60.2)	113 (39.8)
Is there a COVID-19 vaccination that is now effective?	267 (94.0)	17 (6.0)
COVID-19 is a potentially fatal illness or condition.	272 (95.8)	12 (4.2)
1st case of COVID-19 was recorded at China	276 (97.2)	08 (2.8)
What do you think except Pakistan, rest of countries also suffered from COVID19	268 (94.4)	16 (5.6)

Table 3 demonstrated the knowledge score ranking of the study participants towards COVID – 19. The median (IQR) knowledge of the respondents was 13 (2). 94% (n=267) had good knowledge of COVID-19, on the other hand, only 1.4% (n=4) had poor knowledge about this outbreak.

Table 3: Knowledge level of the Participants towards COVID – 19

Knowledge level	*Median (IQR)*/ Frequency (%)
Knowledge Score	13 (2)
Poor Knowledge	4 (1.4)
Moderate Knowledge	13 (4.6)

Figure 1 exhibited the attitude of the subjects towards COVID – 19. Two-thirds (67%) of the respondents had a good attitude toward COVID – 19, whereas 33% had not a good attitude regarding this viral disease. The median (IQR) score was 5 (1).

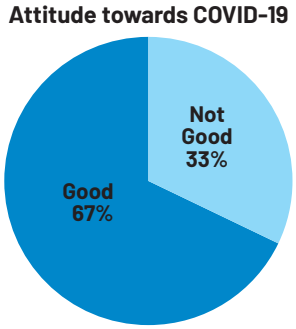

Figure 1: Attitude toward COVID-19

Figure 2 displayed the level of preventive practices of the respondents against COVID -19. Most of the study subjects (88%) had good preventive practices against the new viral infection, whereas 12% did not have good practices for its prevention. The median (IQR) practice score was 15 (2.25).

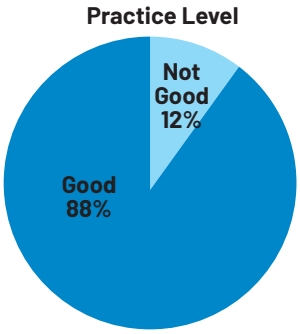

Figure 2: Level of Practice of the Participants against the COVID – 19

Table 4 displayed the assessment of the attitude of the study sample about the COVID – 19 outbreaks. 14.4 % of the subjects thought that COVID – 19 is not a serious disease. Two-thirds (68%) did not agree that it can be treated at home without concerning a doctor. The majority of the respondents agreed use of a face mask (93.7%) and following sneezing etiquette (88.7%) are important preventive strategies. As for as availability of a vaccine for this novel virus, 93.7% replied positively. 205 (72.2%) believed that health education has nothing to do with the prevention of disease. Moreover, 229 (80.6%) thought that dealing with a COVID – 19 positive case did not put you at risk of infection.

Table 4: Assessment of the Attitude towards COVID-19

Statement(s)	Yes ƒ (%)	No ƒ (%)
COVID-19 is NOT a serious illness / disease	41(14.4)	243(85.6)
Is it possible to treat it at home without consulting a doctor?	91 (32.0)	193 (68.0)
Is corona vaccine available?	266 (93.7)	18 (6.3)
Is it crucial to wear a face mask as a preventative measure?	266 (93.7)	18 (6.3)
Is it necessary to follow a proper etiquette when sneezing or coughing?	252 (88.7)	32 (11.3)
Disease prevention has nothing to do with health education.	205 (72.2)	79 (27.8)
The risk of contracting COVID-19 does not increase when handling a patient of COVID-19.	229 (80.6)	55 (19.4)

Table 5 exhibits the Participants' responses to the Practice statements against COVID – 19. In response to "When I sneeze or cough, I use a tissue to cover my mouth and nose" 113 (39.8%) replied, "Sometimes" followed by "Always" 109 (38.4%). A few 5 (1.8%) never covered their nose or mouth at the time of sneezing or coughing. More than half 160 (56.3%) always discard used tissues in the trash bin accompanied by sometimes 75 (25.4%). Only 3 (1.1%) replied never to throw the used tissue in the trash bin. When asked if tissue is in not available, he/ she coughs or sneezes into his/ her upper sleeves. 55.6% answered Always, followed by

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sometimes (27.5%), rarely (10.9%), and Never (6.0%). A similar pattern of practice was observed in the practice of avoiding touching face with hands, use of soap and water to wash hands after coughing, sneezing, or touching contaminated objects, and use of face masks in crowds and when visiting healthcare settings.

Table 5: The Participants' responses to the Practice statements against COVID-19

Statement(s)	Never *f* (%)	Rarely *f* (%)	Sometimes *f* (%)	Always *f* (%)
When I sneeze or cough, I use a tissue to cover my mouth and nose.	5 (1.8)	57 (20.1)	113 (39.8)	109 (38.4)
I throw the used tissue in the trash bin	3 (1.1)	46 (16.2)	75 (26.4)	160 (56.3)
If there isn't a tissue around, I sneeze or cough into my upper sleeve	17 (6.0)	31 (10.9)	78 (27.5)	158 (55.6)
I swiftly wash my hands with soap and water after coughing or sneezing or touching contaminated objects such as a tissue	9 (3.2)	16 (5.6)	72 (25.4)	187 (65.8)
I try to avoid using contaminated hands to touching my face including mouth, nose or eyes.	4 (1.4)	29 (10.2)	71 (25.0)	180 (63.4)
I use a face mask in crowds and when I visit healthcare settings now a days	6 (2.1)	19 (6.7)	55 (19.4)	204 (71.8)

DISCUSSION

COVID-19 is a dynamic and newly emerged viral pandemic, which completely changed the health sector worldwide. Due to the unavailability of prior knowledge, it was a difficult time to handle. Healthcare professionals have played their role in dealing with and helping at every stage and personified a culture of care and empathy when the country's health system is under extensive burden from COVID-19. In the current study, 91.5% have heard about COVID-19. Social media, Facebook, Twitter, Instagram, Newspaper, etc. have found the common source of getting the first news about the outbreak (61.6%) followed by friends, relatives, family or neighbors (24.3%). Similarly, a research study revealed that the public's understanding of the pandemic was significantly influenced by the media, particularly social media platforms. One of the main things that caught the public's interest was reporting on the fatalities and mortality rates from various parts of the world [11]. The median (IQR) score was 13 (2) in this study. Most of the participants had good knowledge, while 1.4% had poor knowledge of the disease. Though the figures are very low, however, at this stage for participants, it is a matter of concern as faculty members had a greater responsibility on their shoulders to bear a double burden in training and supervision of professionals and emphasis their role in the preventive and curative sector. Attitudes have played a central role in the explanation of behaviour and actions. The majority (67%) of the study subjects had a good attitude towards this novel viral disease. Most of the respondents believed that it is a serious disease (85.6%). This proportion was found in line with the previously conducted study in Punjab, Pakistan [12] with other studies conducted in the U.S. and Canada [13]. However, slightly higher than the study conducted in Qatar [14]. On the other side, a smaller amount (14.4%) of participants did not think the disease was serious, which offers additional difficulty for policymakers to restrict the spread and increase awareness about the disease. In this study, a large number of respondents considered face masks as a preventive strategy (93.7%) and follow coughing or sneezing etiquettes (88.7%). Surprisingly, about three-fourths of the study participants agreed that managing a COVID-19 patient does not put you at danger of contracting the infection and that health education has nothing to do with disease prevention. While, it is documentary evidence that there is a need for specialized health education for raising awareness, changing attitudes, and promoting the use of suggested precautions to stop the spread of COVID-19 [15]. Knowledge and attitude of an individual have a direct relationship with his behaviour and became more favorable towards preventive practices when became more knowledgeable of the disease [16]. In the present study, 88% of the participants had good preventive practices against the coronavirus infection. A positive response to the statements regarding practice against COVID-19 was observed among the faculty members. A large number of respondents were always practicing preventive measures to break the chain of infection and prevent its spread. The findings are different from a previously conducted study in the Pakistani context [12]. Similar to our study results, participants in previous studies showed a variety of behaviour, including wearing masks, maintaining social distance, practicing personal hygiene, and washing their hands to prevent the spread of the disease and to protect themselves [13, 14]. Those who are not practicing preventive actions, endangering their lives as well as of others. Fears have been spread around the world due to COVID-19's deadly and unpredictable character. The findings of this study reported fear of COVID -19 in 70.4% of participants. The main cause of such fear is considering this novel disease highly contagious (35.6%) and had no cure (20.4%). Moreover, only two participants had afraid due to the unavailability of the preventive method. This could be a campaign run by the government and WHO on electronic and social media about the preventive measures updated from time to time. Most of the faculty members viewed a lack of awareness about the disease as the main hurdle in controlling its spread. It is thought about social media that it overestimates everything and creates a panic

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situation [17]. The participants from the current study agreed with this statement and were concurrent with earlier studies [12]. According to a prior study, the fear and panic brought on by the distribution of the COVID-19 pandemic's information are disseminated on social media more swiftly than the virus itself [18]. The previous study reveals that in the crucial time of the COVID-19 pandemic when social life and interaction almost ceased, social media was utilized to spread opinions on distant learning, health care, and other topics. this platform can be a useful tool for governments and professionals to stop the spread of this disease and even other problems of the same kind in the future [19]. More than half of the study subjects believed that COVID -19 could not be brought under control in 2021 and did not believe that no food can effectively prevent or cure this disease and agrees with the report from WHO, however, a healthy diet can provide a robust immune system that can combat any viral attack and reducing chances of other comorbid [20]. The use of balanced dies consisted unprocessed food such as fruits, vegetables, whole grains, and nuts is of vital importance containing all essential nutrients [21]. According to the report, individuals are becoming increasingly interested in healthy eating practices and diets that include supplemental ingredients like vitamins and medicinal plants [22]. Since COVID-19 has latent symptoms, it is difficult to determine who may be infected. As the virus is very contagious, it can be shed off during breathing, coughing, sneezing, laughing etc. Those who are suspected to have the infection should be kept quarantined until not confirmed by testing. It works well to keep the public safe. To halt the spread of infectious diseases, governments impose quarantines. Individuals or groups who have been exposed to the disease but show no symptoms are placed in quarantines, so they don't unintentionally infect anyone [23]. The study findings are in agreement with these reports as the majority of the study participants (82.7%) agreed with quarantining suspected individuals. 80.3% of the study subjects thought that thermal screening at sea or air ports can stop the spread of COVID-19 while nearly half believed that it is safe to go a country with reported COVID-19. Table 4 displayed the assessment of the attitude of the study sample about the COVID – 19 outbreaks. 14.4 % of the subjects thought that COVID – 19 is not a serious disease. Two-thirds (68%) did not agree that it can be treated at home without concerning a doctor. The majority of the respondents agreed use of a face mask (93.7%) and following sneezing etiquette (88.7%) are important preventive strategies. As for as availability of a vaccine for this novel virus, 93.7% replied positively. 205 (72.2%) believed that health education has nothing to do with the prevention of disease. Moreover, 229 (80.6%) thought that dealing with a COVID – 19 positive case did not put you at risk of infection.

CONCLUSIONS

The results of the current study showed that most of the respondents had good knowledge of COVID-19, had a positive attitude, and used preventive practices adequately. Lack of awareness was found to be a major barrier to controlling the spread of disease. Social media and other online platforms were the major source of information for the participants.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Prevalence of Anxiety and Depression in Medically Ill Patients Admitted in OPD of AIMS Muzaffarabad AJ&K

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ABSTRACT

Neuropsychiatric disorders, particularly high levels of anxiety and depressive symptoms, are increasing in primary health care settings because of their impact on quality of life, service satisfaction, medication adherence, patient outcomes, and functioning increase. **Objective:** To assess the prevalence of anxiety and depression disorder in patients of medical OPD and investigates its prevalence with medical illnesses. To contribute in raising awareness about the significance of medical illnesses and its relation with anxiety and depression. **Methods:** Descriptive study design was used. The study analyzed 120 male and females. Hospital anxiety and depression Scale (HADS) was used to investigate the prevalence in medically unwell patients across all age and gender categories. The study took place in Muzaffarabad October 2020 to March 2021. Performa was circulated physical availability of participants. Convenient sampling technique was used for data collection. Patients with recognized psychiatric problems were not allowed to participate in trail. Analyze data with IBM SPSS (Statistical Package for the Social Sciences) version-21.0. **Results:** Overall 91% of patients showed depression and anxiety disorders of various severities. A significant inverse correlation is found between Anxiety and depression and medical illnesses of p-value of p 0.05 as per chi-square test. **Conclusions:** Finding suggests that medical illnesses may have positive influences on mental health disorder. The occurrence of co-morbidity between anxiety and depression and medical condition is common and remain undiagnosed, thus lowering depressive scores and enhancing mental health.

INTRODUCTION

There are many interactions between the immune system, nervous system, and mental health. These interactions include communication pathways from the brain to the immune system, particularly the hypothalamic-pituitary-adrenal (HPA) axis and the autonomic nervous system, which mediate the effects of psychiatric disorders such as stress and anxiety. Emotions affect immunity and disease to resistance [1]. Neuropsychiatric disorders, particularly high levels of anxiety and depressive symptoms, are increasing in primary health care settings because of their impact on quality of life, service satisfaction, medication adherence, patient outcomes, and functioning increase [2, 3]. Anxiety is a mental condition characterized by tense sensations, anxious thoughts, and physical changes such as high blood pressure. Recurring troublesome thoughts and worries are hallmarks of anxiety disorders. They may avoid the situations because they care. Sweating, tremors, dizziness and increased heart rate are is all possible physical symptoms. Depression is characterized by depressed mood, a loss of interest and pleasure, low energy and feelings of guilt, low self-esteem, and confusion. In the future, sleep or appetite is disturbed and wakefulness is also disturbed. Anxiety symptoms are also commonly associated with depression [4]. Depression is a

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common illness. Reported rate of major depression in patients with this condition range from 5% to over 40%. However, depression in affected patients is often goes unrecognized and untreated. The prevalence reported in most studies is probably lower [5]. The high prevalence of depression in a various disorder is reflected in the specific psychiatric diagnosis 'Depression associated with general health and general medical conditions through physiological mechanisms. Several lines of evidence suggest that this mechanism is involved in the immune system [6]. That is, depression that accompanying various diseases may be directly induced by activation of the immune system, and may also appear as a response to trauma, pain, and loss related to the physical disease process [7]. Experimentally induced viral infections (e.g., colds and flu) and spontaneous upper respiratory infections or flu cause depressed mood and other depressive symptoms, as well as a variety of neuropsychiatric disorders [8]. Patients presenting to the emergency department with chest pain (CP) may exhibit symptoms associated with psychiatric disorders, such as anxiety and depression. Her two most common diagnoses were found to be mood disorders and anxiety. A review study' showed that he was diagnosed with panic disorder (PD) in 30.1% of patients presenting to the emergency room (ER) with chest pain. Of these, 22.4% showed PD without coronary artery disease (CAD). Patients with undiagnosed and therefore inadequately treated anxiety and depressive disorders tend to complain of chronic symptoms and seek regular medical attention [9, 10]. Back pain is a growing economic and health problem affecting nearly 80% of the general population. Many guidelines for the diagnosis and treatment of chronic low back pain have been published. Most of them are candid, but few emphasize the fact that general practitioners are really short on resources provided by mental illness treatment. Up to 30% of people, who later report back pain, have recurring or persistent symptoms. Chronic back pain is therefore one of the most common reasons for seeking treatment. Emotional stress has long been recognized as a factor in suffering and its perceptions [11, 12]. Like people with other chronic medical conditions, people with hypertension experience many serious emotions and are at increased risk of developing psychiatric disorder, especially anxiety and depression. Patient's adherence to pharmacological and non-pharmacologic therapies is essential for the management of hypertension, and these negative feelings can adversely affect treatment adherence [13]. Patient with diabetes mellitus, whether type I or type II, are prone to vulnerable depression. The anxiety of being diagnosed with diabetes, the constant stress of sticking to a treatment plan and the body of an advanced disease. Fear of social consequences all contribute to depression. A study conducted in Pakistan found that prevalence of diabetes mellitus in was 6% in men and 3.5% in men in rural areas. 6.5% and 2.5% women. Diabetics with long term complications have an even higher incidence of depression [14]. Recognizing depression in chronically ill patient can be difficult. This is because the symptoms of some depression are so similar to medical symptoms that they are difficult to differentiate. For instance, depression and medical conditions can cause fatigue, loss of appetite, and decreased alertness [15].

METHODS

The cross-sectional study was conducted at the Abbas Institute of Medical Sciences, Muzaffarabad Azad Jammu and Kashmir's outside patients' Medical Department from October 2020 to March 2021. Convenient sampling technique which is a non-probability sampling method was used. Data were collected randomly from the availability of the patient in medical outpatient department. This study collected data from 120 medical patients as per sample size (calculated by the WHO sample size calculator) studying in various medical hospitals. Data included both genders and all ages, regardless of marital status or educational background (capability to write and read). Patients with recognized psychiatric problems were not allowed to participate in the trial. The study covered all patients with serious medical illnesses and issues who were referred to the medical outdoor patients' department for medical disease treatment. All these patients provided written informed consent, and their demographic information was gathered using a Performa specifically prepared for this purpose in Urdu version (for the convenience of participants). This study collected data from 120 medical patients with demographic information of age, gender, diagnosed medical illness and HADS score. The patients were questioned, and clinical assessment criteria from the DSM V for depression and anxiety disorders were used. Then administered the Urdu version of HADS to the sample group. The questionnaire comprised of 14 questions aimed at determining the severity of depression and anxiety in our sample. Seven items of the measures were for assessing anxiety, while the other seven were for assessing depression. For both anxiety and sadness, the cutoff value is 7. Since its inception, HADS has been translated into other languages and used in over 25 countries. According to Herrmann's comprehensive review, HADS devices have demonstrated robust reliability and validity in evaluating medical patients [16]. Analyzed the data with IBM SPSS (Statistical Package for the Social Sciences) version-21.0.

RESULTS

Physical health illnesses mostly increase the risk of developing mental health problems. Nearly one third of

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people with long-term physical illness may also have mental health problems, in which most commonly is depression and anxiety. Medical illness frequency and severity of anxiety and depression are analyzed in the categories of gender, age, diagnosed medical illness and HADS score. In 120 participants there were 74 (62%) female patients and 46 (38%) were male respondents with an average age of 16-70 years. Cumulatively age 78% of cases were found in the age group of 26-55 years, indicating a higher incidence of anxiety and depression in medically ill patients.

Table 1: Characteristics of study participants with their demographic values

Characteristics	Demographics
Male	46(38.3%)
Female	74(61.7%)
Age	
16-25	16(13.3%)
26-35	35(29.9%)
36-45	23(19.2%)
46-55	20(16.7%)
56-65	12(10%)
Greater than 66%	14(11.7%)

Table 2 reflects that desegregation on gender basis result shows that 5 (11%) males were in case category, 2(4%) were borderline while 39 (85%) were cases having severe depression and anxiety along with other medical conditions. While, 2 (3%) females were non-cases, 2 (3%) were borderline and 70 (94%) were with severe depression and anxiety with higher level of anxiety and depression with the history of medical illness. It reflects that frequency of anxiety and depression is very high among the patients with the history of medical illness.

Table 2: Gender and grading wise cases distribution

Gender	Grading	Frequency (%)
Female	0-7	2(2.7)
	8-10	2(27)
	11+	70(94.6)
	Total	74(100)
Male	0-7	5(10.9)
	8-10	2(4.3)
	11+	39(84.8)
	Total	46(100)

Table 3 shows that association between anxiety and depression with medical illnesses. The higher percentage (28.0%) of anxiety and depression lies in low back pain patient's category. Prevalence also observed higher in Diabetes (16.0%) and cardiac problems (15.0%). Anxiety and high blood pressure can be symptoms of each other. Anxiety may lead to high blood pressure and high blood pressure can trigger feelings of anxiety. In our study patient with hypertension also reveals high percentage (11.2%). Sciatica is a panic condition which interferes in social emotional functioning and increase anxiety and depression percentage level e.g. (10.02%). Asthma is also a chronic condition which can cause anxiety and depression as in our study (8.6%). A significant relationship was found between HADS scores and medical illnesses with a p-value of 0.025.

Table 3: Association between anxiety and depression severity with medical illnesses

Diseases	Frequency (%)	Anxiety & depression subscale%
Asthma (respiratory problems)	6(5)	8.6%
Viral Infection	8(6.7)	4.2%
Cardiac problem	11(9.2)	15.0%
Diabetic	18(15)	16.0%
Gynae problem	5(4.2)	7.0%
Hyper tension	18(15)	11.2%
No case	8(6.7)	0
Low back pain	30(25)	28.0%
Sciatica	16(13.2)	10.0%
Total	120(100)	100.0%

Anxiety can lead to hypertension and hypertension can cause feelings of anxiety. Different his HADS scores were recorded for both anxiety and depression sub-scale (Table 4). Evaluation of the prevalence of depression and anxiety in the medically ill patient, using Urdu version of HADS indicated the prevalence of depression 55(45.83%) was found to be more frequently than Anxiety 38 (31.6%). 109 (91 %) patients were cases, (11+ Scale category) of both sexes suffering from anxiety and depression with medical illness. While 11 patients (9%) had neither anxiety nor depression and are in normal category. Depression was more prevalent in patients as compared anxiety among the patients with medical illness as shown in table 4.A significant relationship was found between medical illness and anxiety and depression severity.

Table 4: Frequency of anxiety and depression HADS scales scores

HADS Subscale	Anxiety Subscales patients %	Depression Subscales patients
Normal 0-7	67 (56%)	45 (37.5%)
Borderline Abnormal 8-10	15 (12.5%)	20 (16.6%)
Abnormal 11-21	38 (31.6%)	55 (45.83%)
Total	120	120

DISCUSSION

Analysis of the data of this study is significant as it was conducted at a medical out patients department which seems to be a better place to study psychiatric morbidity in patients affecting from medical illnesses. The findings of the study show anxiety and depression in patients with medical illnesses are comparable and consistent and they support the findings of recent studies in Pakistan. According to results of Misgan and Belete study the

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prevalence of anxiety and depression among patients with medical illness found to be 12.6% and 10.1% respectively as compared to the community sample where the prevalence of anxiety and depression found to be 6.8% and 5.0% respectively [17]. The research and studies of Mossie *et al.*, and Roy-Byrne *et al.*, also prove that patients with general medical illness tends to have prevalence and co morbidity of anxiety and depression two times higher than the community sample [18-20]. Therefore, this situation, which indicates that high level of anxiety and depression symptoms may occur due to medical and psychosocial problems, shows that the participants who participated in our study with the sample group were at higher risk in terms of anxiety and depressive symptoms. Castor *et al.*, study showed that the majority of patients (approximately 74%) in our study were female [21]. The table 2 shows that females (95%) are in case (sever) condition of anxiety and patients while at male side 39(85%) are in sever condition. And in all other conditions (Normal and moderate) minors' patients are existed. The Castro *et al.*, study established the fact that women are more likely (almost 1.5 to 2 times higher) to have anxiety and depression than men, that also validates our results. As seen in Waheed *et al.*, study most of the patients in our sample were elderly [21, 22]. Advanced age associated with higher of anxiety (p<.0001), but no symptoms of high depression (p=.155) and being 45 years or older doubled the risk of anxiety with more anxiety symptoms. Between 18 and 24 years old. Predictably, anxiety symptoms always increase with age; this is a finding based on an understanding of this model [23]. Many cross-sectional studies show an association between psychological factors and the presence of low back pain. Our study also found a high prevalence of anxiety and depressive symptoms, 28.0% of patients with chronic low back pain. These results were also confirmed in a study of 70 German patients with low back pain, of whom 36% reported abnormal anxiety (HADS -D>8) and 29% reported abnormal depression (HADS-D>8). 47% of patients show abnormal anxiety and depression level [24]. The current study found that depression was more prevalent in patients who had been ill for longer period, whereas anxiety was more prevalent in those who had been ill for a shorter period. As it is also showed in our study in Table 3 Sciatica (10.0%0) Hypertension (15.0%). This is understandable since long-term stress from a medical ailment is more likely to affect an individual's mood in the form of depressive symptoms, including feelings of hopelessness and vulnerability. The Katon study and Nikbakhsh *et al.*, suggests that the patients with chronic or long term medically diseases tend to have more depression as compared to the patients with minor illness [25, 26]. Short-term medical illness, on the other hand, is likely to make person apprehensive and irritable, as well as cause restlessness and discomfort (Viral Infections 4.2%). The relationship of diabetes with depression and anxiety is very complex. Because diabetic patients experience depressive symptoms and poor self-care and compliance can worsen diabetic outcomes.37% increased risk of developing type-2 diabetes. Our study also showed a higher prevalence of anxiety and depression among diabetics (15%). In a study when comparison was done in diabetics with non-diabetic controls, people with type-2 diabetes had a24% increased risk of developing depression although the underlying basis for this relationship was not clear. As also observed in our study, older women with type 2 diabetes suffer from depression and anxiety more often than their male colleagues, but data regarding this gender trend are conflicting [27]. There is also high anxiety and depression prevalence observed in cardiac patients presenting with medical illness (15.0%). A study also supported the result of previous Bringager *et al.*, study [28].

CONCLUSIONS

The occurrence of co morbidity between anxiety, depression, and medical condition is common and remains undiagnosed. Patients who are affected commonly seek medical help from general practitioners and physicians, who frequently fail to grasp and recognize anxiety and depression, even though there is a link between the two disorders. As a result, diagnosis, and therapy becomes the medical ailment. Furthermore, psychological disorders, medical illnesses and physical limits have long been recognized as helping factors in the development of anxiety and depression during period of medical illness. A common mechanism that underpins some of these co morbidities has been explored, diagnosed, and identified in the last decade. This leads us to the conclusion that these violations are so common, and that such co morbidities are a downward escalating state in which anxiety, sadness, and medical sickness all contribute to each other as risk factors, eventually worsening patient outcomes. Psychological aspects are found to be significant in the management and therapy of people with anxiety and depression who also have a medical disease. Appropriate therapy should be started for people with complicated co morbid disorders such anxiety and depression.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Association of Elevated Heart Risk Score with Myocardial Infarction in Patients with Chest Pain

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ABSTRACT

The HEART score is a widely used diagnostic tool in patients with chest pain. This tool is a very effective method for the stratification of patients with chest pain in the emergency department. It is composed of five components, i.e., history, ECG, age risk factors and troponins. **Objective:** To assess the importance of HEART score in our population. **Methods:** This study was conducted at emergency department of Ziauddin University Hospital, Karachi, Pakistan from 01 January 2021 to 30 June 2022. A cohort study of the HEART risk score in myocardial infarction (MI) patients presented with chest pain was conducted. 244 patients were selected by consecutive sampling and distributed into two groups i.e., non-exposed (HEART risk score 0-3) and exposed group (HEART risk score ≥ 4). The HEART risk score was calculated and patients were followed for the next 48 hours. **Results:** Patients of both groups were monitored for forty-eight hours and the results were myocardial infarction (MI) in 1 (0.8%) patient and 86 (70.5%) patients in group A (low risk) and group B (high risk) respectively. One patient (0.8%) in each group A (low risk) and in group B (high risk) left against medical advice (LAMA). One hundred twenty (98.4%) patients in group A and thirty-five (28.7%) patients in group B (high risk) were discharged. No patient (0.0%) expired in group A (low risk) and in group B (high risk) respectively. **Conclusions:** It was concluded from the study that the HEART risk score is very much helpful as a diagnostic tool in patients with chest pain, presented in the emergency

INTRODUCTION

Myocardial infarction (MI), commonly called "Heart Attack" is brought about due to complete or diminished stoppage of blood flow to the segment of the myocardium. It is commonly known as a "silent killer" because remains undetected for a prolonged period or also known as “catastrophic disease” deteriorates the dynamics of blood flow, resulting in sudden death [1]. A patient presented with pain or pressure or with any discomforted-on chest which is radiating either towards the neck, jaw, shoulder, or arm with previous history will be considered as myocardial infarction. Diagnosis will be confirmed on physical examination, electrocardiogram (ECG) and on the elevation of cardiac troponins. Early evaluation of myocardial infarction increased the chances of heart reperfusion and blood flow restoration and rapid recovery of the patient [2, 3]. MI is the most common manifestation of coronary artery disease (CAD) which is the most commonly reported cause of mortality and disability throughout the world [4]. According to WHO, more than 12.2% of deaths in the world are reported due to ischemic disease (IHD), among which the majority of the deaths are reported from developing countries [5]. Approximately three million and four million people are suffering from STEMI and NSTEMI respectively. Whereas the rate of STEMI is two times higher in males as compared to females [6, 7]. Approximately 17.1 million deaths are reported in the world because of coronary heart

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disease (CHD). CHD is considered the largest global contributor to mortality whereas approximately 39% of deaths have been reported in developing countries in patients with having age < 70 years [8, 9]. Risk of myocardial infarction is very much high in the Asian population and the approximate rate of myocardial infarction is 50% higher in the South Asian population [10, 11]. HEART risk score is a widely used diagnostic tool in patients with chest pain. It is composed of five components, i.e., history, ECG, age, risk factors and troponins. In this study, we have assessed whether the HEART score is an effective screening method to differentiate between chest pain of cardiac ad non-cardiac origin.

METHODS

A cohort study of HEART risk score in patients presented with chest pain was conducted at the emergency department of Ziauddin University Hospital, Karachi from 01 January 2021 to 30 June 2022. 244 patients were selected by consecutive sampling and distributed into two groups namely group A (low-risk group with HEART risk score 0-3) and group B (high-risk group with HEART risk score ≥ 4). Patients with previously known comorbid diabetes mellitus (DM), hypertension (HTN), ischemic heart disease (IHD), dyslipidaemia and those with a history of smoking, alcohol abuse and drug abuse were included in this study. While the patients with a history of trauma and the patients who could not be followed were excluded from our study. Informed consent was taken from patients. A detailed proforma was filled according to HEART risk score parameters. Group A patients were followed in the emergency department for the next forty-eight hours taking their ECG and troponin tests. Their initial HEART risk score was calculated. They were discharged from the emergency department as they are likely to fall into a low-risk group for a MACE (Major adverse cardiac Event). Their contact numbers were taken, and they were asked to fill in the requisite HEART risk score proforma. They were asked to return to the emergency department and repeat their troponin I and ECGs on an eight hourly basis till completion of three sets of ECGs and three sets of troponin I respectively. Their final HEART risk score was calculated based on all three ECGs' and troponin I level. If they still had a HEART score of 0-3, they were safely discharged from the emergency department. If the HEART risk score falls greater than 4, he or she was admitted to the hospital, treated and managed as having a MACE (Major Adverse Cardiac Event). A 12-lead ECG was recorded with a sensitivity of 10 mm/mv and a paper speed of 25 mm/s from all patients on admission to the emergency room. ECG measurements. were made manually by residents of the emergency room. Serum samples for troponin levels were sent to the laboratory. ECG was seen by a doctor. The endpoint that we were looking for in our research was whether or not a patient who was presenting in the emergency department with chest pain was having a MACE (Major Adverse Cardiac Event). The application of the HEART risk score helps us effectively and rapidly to sort out patients with chest pain, who were undergoing MACE at any moment and to reduce such episodes shortly as well. MACE could be ST-segment elevation MI, Non-ST-segment elevation MI, or Stable or Un-stable angina. The analysis of data was done using SPSS version 20.0 and a p-value of ≤ 0.05 was taken as statistically significant.

RESULTS

The HEART risk score of patients was evaluated on five parameters including the history of the patient, electrocardiogram (ECG) of the patient, age of patient, presence or absence of risk factors and level of troponin in the blood of patients. History of patients was slightly or non-suspicious in 7 (5.7%) patients in group A (low-risk group) and 0 (0.0%) patients in group B (high-risk group), moderately suspicious in 114 (93.4%) patients and 67 (54.9%) patients and highly suspicious in 1 (0.8%) patient and 55 (45.1%) patients in group A (low risk) and group B (high risk) respectively (Table 1).

Table 1: Distribution of HEART risk score (History) in group A and group B

History	Group A N (%)	Group B N (%)
Slightly or non-suspicious	7 (5.7)	0 (0)
Moderately suspicious	114 (93.4)	67 (54.9)
Highly suspicious	1 (0.8)	55 (45.1)

ECG of patients was normal in 28 (23%) patients and 6 (4.9%) patients, non-specific repolarization disturbance/ LBBB/ PM in 93 (76.2%) patients and 64 (52.5%) patients and significant ST-deviation in 1 (0.8%) patient and 52 (42.6%) patients in group A (low risk) and group B (high risk) respectively (Table 2).

Table 2: Distribution of HEART risk score (ECG) in group A and group B

History	Group A N (%)	Group B N (%)
Normal	28 (23)	6 (4.9)
Non-specific repolarization disturbance/LBBB/PM	93 (76.2)	64 (52.5)
Significant ST-deviation	1 (0.8)	52 (42.6)

The age of patients was ≤ 45 years in 112 (91.8%) patients and 10 (8.2%) patients, > 45 and < 65 years in 10 (8.2%) patients and 62 (50.8%) patients and ≥ 65 years in 0 (0.0%) patients and 50 (41.0%) patients in group A (low risk) and in group B (high risk) respectively (Table 3).

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Table 3: Distribution of HEART risk score (Age) in group A and group B

History	Group A N (%)	Group B N (%)
≤ 45 Years	112 (91.8)	10 (8.2)
> 45 and < 65 Years	10 (8.2)	62 (50.8)
≥ 65 Years	0 (0.0)	50 (41.0)

Risk factors in patients were categorized as; no risk factors known in 33 (27.0%) patients and 5 (4.1%) patients, 1 or 2 Risk factors in 88 (72.1%) patients and 90 (73.8%) patients and ≥ 3 Risk factors or history of atherosclerotic disease in 1 (0.8%) patient and 27 (22.1%) patients in group A (low risk) and group B (high risk) respectively (Figure 1).

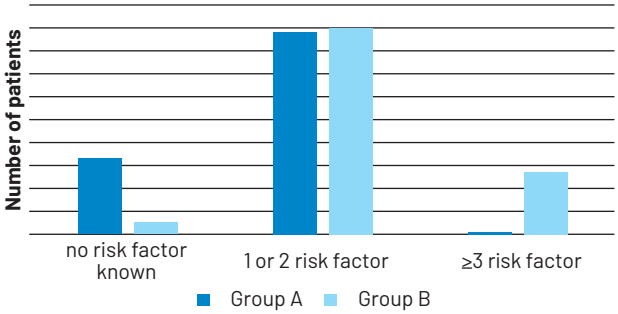

Figure 1: Distribution of HEART risk score (risk factors) in groups A and B

Troponin level in patients was ≤ 1 × normal limit in 121 (99.2%) patients and 44 (36.1%) patients, > 1 and < 3 × normal limit in 1 (0.8%) patient and 53 (43.4%) patients and ≥ 3 × normal limit in 0 (0.0%) patients and 25 (20.5%) patients in group A (low risk) and in group B (high risk) respectively (Figure 2).

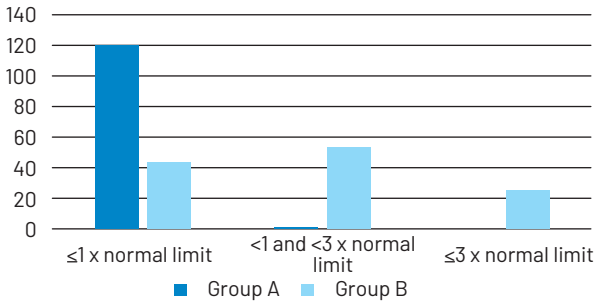

Figure 2: Distribution of HEART risk score (troponin) in groups A and B

Patients of both groups were monitored for forty-eight hours and the results were myocardial infarction (MI) in 1 (0.8%) patient and 86 (70.5%) patients in group A (low risk) and group B (high risk) respectively. One patient (0.8%) in each group A (low risk) and in group B (high risk) left against medical advice (LAMA). One hundred twenty (98.4%) patients in group A and thirty-five (28.7%) patients in group B (high risk) were discharged. No patient (0.0%) expired in group A (low risk) and group B (high risk) respectively (Figure 3).

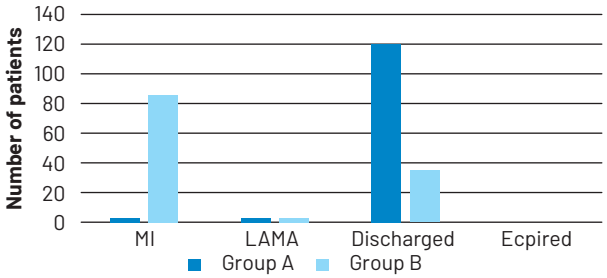

Figure 3: Distribution of outcome in groups A and B

DISCUSSION

Chest pain is among the most commonly observed reasons for a patient visiting the emergency department (ED). In the majority of the cases, chest pain is reported due to a heart problem, but it may occur due to several other reasons that should be identified and distinguished. In ED, the patient is quickly assessed and diagnosed, especially in the case of ST-Elevation Myocardial Infarction (STEMI). However, STEMI is not the only reason behind chest pain, it accounts for only a small percentage of total cases of chest pain. In heart disease, MI is the common reason for chest pain but several other diseases such as pulmonary embolism, pleural and/or pericardial irritations, hyperventilation, gastrointestinal reflux, and cholecystitis may also be responsible for chest pain [12]. In ED, early diagnosis of the disease is very much important and a challenge for appropriate treatment, but segregation of high-risk patients from low-risk patients or patients without any diseases is also very important because it consumes physician time and health care resources. So, patients should be early identified into high and low-risk groups and managed accordingly. Such as low-risk group patients should be clinically assessed, diagnosed, managed and discharged with or without medication and advice of follow-up, whereas high-risk group patients should be clinically assessed, diagnosed and admitted for further management or discharged with medications and with the advice of follow-up [13, 14]. Early risk assessment of MI patients presenting with chest pain in ED is very important. Therefore, different researchers work on the development of scoring systems for MI risk evaluation and distributing patients into low and high risk. Groups. Recently, several scoring systems are used either in ED or intensive care unit of cardiology for segregating patients of MI with high risk or low that helps in appropriate management [15, 16]. Some of the commonly used scoring systems are PURSUIT, TIMI, GRACE, FRISC Sanchis, Florence and HEART. The HEART risk score was developed in 2008. HEART score uses five parameters including the history of the patient, age, presence of risk factors, ECG and level of troponin for the final decision of MI [17]. In the current research, 244 patients presented with chest pain were evaluated and

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distributed into two groups, i.e., the first group was a low-risk group having a HEART risk score between 0-3 with 122 patients and the second group with high risk having HEART risk score between 4-10 with 122 patients. Both group patients were evaluated for forty-eight hours and MI as Major Adverse Cardiac Event (MACE) was reported in only one (0.8%) patient in a low-risk group and MI as MACE was reported in 86 (70.5%) patients in the high-risk group. A similar study by Six *et al.*, reported the risk of MACE in 2.5%, 20.3% and 72.7% patients having HEART risk 0-3, 4-6 and ≥ 7 respectively [18]. Another study by Mahler *et al.*, reported a 0% risk of MACE in the low-risk group and a 22.7% risk of MACE in the high-risk group [19, 20]. Both groups' evaluation indicates that patients with HEART risk score 0-3 have a 0.8% risk of MACE so these patients should be early discharged with medication and advice of follow-up, whereas patients with HEART risk score 4- 10 should not be discharged early from ED. They should be admitted to the hospital and carefully monitored and treated according to standard protocols.

CONCLUSIONS

It was concluded from the study that the HEART risk score is very much helpful as a diagnostic tool in patients with chest pain, presented in the emergency department. The HEART risk score helps segregate the patients into low and high risk of development of MACE. HEART score is very much helpful for a cardiologist in early diagnosis and selection of appropriate treatment. The most important advantages of the HEART risk score are its simplicity, quickness, easiness and reliability in predicting the MACE in patients presenting in ED with chest pain. Results of this study demonstrate that the HEART risk score substantially reduces healthcare utilization among patients with chest pain, presenting to the emergency department, without missing adverse cardiac events or increasing cardiac-related ED visits.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Comparing Medical Doctors' Views on Alternative Medicine in Taiwan and Sweden

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ABSTRACT

Numerous research endeavors have delved into the perceptions of medical physicians regarding alternative medicine; nevertheless, none have employed the symbolic interaction paradigm to scrutinize their individual viewpoints. **Objective:** To broaden our knowledge of complementary medicine by analyzing the viewpoints and engagement with it among individuals hailing from Taiwan and Sweden. **Methods:** Semi-structured interviews were conducted with a diverse group of medical professionals from Taiwan and Sweden, representing a range of specialties and levels of experience. **Results:** Four themes were identified: (1) Evidence-based medicine, (2) The views of medical doctors on alternative medicine, (3) Belief associated with alternative medicine, and (4) Stigma associated with alternative medicine. **Conclusions:** The findings indicate a common understanding of Western medicine as evidence-based among both Taiwanese and Swedish doctors, with Taiwanese doctors also viewing alternative medicine as experience-based, reflecting the influence of local history, social context, and regulations.

INTRODUCTION

The trajectory of sociology as a discipline is intricately linked with the incorporation of biological insights and the exploration of the sociological dimensions of disease [1]. The incorporation of a social perspective in healthcare holds promise for advancing our comprehension of this domain, while also presenting novel insights and obstacles [2]. Sociology, with its scrutiny of the ways in which institutions mold the behaviors and choices of individuals, offers a valuable framework for exploring the societal implications of healthcare practices [2]. The field of medical sociology involves the study and examination of how social and cultural factors impact healthcare, illness, and medical facilities [3]. It serves as a complementary perspective to the prevailing biomedical or psychological views that are prominent within the medical community [3]. Conventional medicine, also referred to as Western medicine, and alternative medicine exhibit divergent ontologies and evolutionary paths. These two medical approaches differ in their fundamental philosophical tenets and historical trajectories [4]. Medical practitioners, comprising of physicians, physical therapists and psychologists, administer Western medicine that primarily emphasizes the identification and management of diseases [5]. Alternative medicine encompasses various medical and healthcare systems, including acupuncture, chiropractic, homeopathy, and traditional Chinese medicine, which are not integrated into conventional Western medicine and often rely on natural, holistic, and non-invasive approaches to promote healing and well-being [6]. In Taiwan, the regulation of Western

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medicine and Traditional Chinese Medicine (TCM) is carried out by separate governing bodies: The Taiwan Food and Drug Administration (TFDA) for Western medicine, while the Department of Chinese Medicine and Pharmacy (DCMP) oversees TCM [7]. On the other hand, Sweden has a uniform healthcare system that solely uses Western medicine and does not have an all-encompassing approach towards complementary and alternative medicines [8]. Symbolic interactionism examines micro-processes in social interaction [9]. In medical sociology, the viewpoint is that illness should be perceived as a social construct rather than being solely viewed as a clinical condition [2]. This approach acknowledges the "micro-level" interaction between doctors and individual patients in the medical profession [2]. Symbolic interactionism can potentially aid in the better understanding of healthcare-related issues, such as preventing sexually transmitted infections, violent behavior, and the use or abuse of psychoactive substances [10]. Several studies have explored medical doctors' attitudes towards alternative medicine [11-14], but none have used symbolic interactionism to examine the subjective views of medical doctors. This study aims to fill this gap by employing qualitative interviews to gain a deeper understanding of cross-cultural perspectives on medical doctors' attitudes towards alternative medicine.

METHODS

This research aimed to explore individuals' perceptions and engagement with complementary medicine in Taiwan and Sweden. The investigation mainly revolves around the following queries: [15]. Can you explain what is meant by allopathic medicine? Can you explain what is meant by alternative medicine? Can you provide insight into how patients in your country perceive and interact with alternative medicine? Eight medical doctors were selected for this study, five from Taiwan and three from Sweden. These participants were sourced through a combination of internet searches and social contacts. They came from various backgrounds and had different levels of experience, ranging from clinical and academic to full-time research, resident, dentist, and student with internship experiences. The data collection process involved conducting semi-structured interviews from October to November 2020. Taiwanese participants were interviewed in-person, while Swedish participants were interviewed via Zoom and Skype. The objective of the research was clarified to every participant prior to the interview, and their approval was sought for audio recording, all while emphasizing on ensuring complete privacy and confidentiality of the gathered data. The interviews were transcribed using an online tool called Speechnotes. (https://speechnotes.co/) [15, 16]. This article's data is a republication of a chapter from the author's master's thesis which can be found in the repository of the Swedish University of Agricultural Sciences at the following link: [https://stud.epsilon.slu.se/17166/][15].

RESULTS

The medical doctors offered their thoughts on alternative medicine and used symbolic language and narratives to illustrate their perspectives. This paper will explore the major themes that emerged from the data collected, which include [15]: 1- Evidence-based medicine. 2- The views of medical doctors on alternative medicine. 3- Beliefs associated with alternative medicine. 4- Stigmas associated with alternative medicine.

Theme 1: Evidence-based medicine

The individuals who were part of the research have a foundation in conventional medicine. It is worth mentioning that those who participated from Taiwan and Sweden shared the belief that evidence-based medicine is the core principle of Western medicine. In their understanding, evidence-based medicine involves a systematic approach to drug development, which includes preliminary experiments utilizing animal cells, followed by clinical trials. Such an approach aims to generate reliable evidence and empirical data in support of the safety and efficacy of drug interventions.

"It's very important for treatment [that] we need to do a lot of work, to do clinical trials in four steps to approve in three steps the drug. I think Western medicine [...] it's between art and science, but I think maybe science 95% and art part is 5%."(Taiwanese respondent)

"Western medicine [...] focuses on scientific evidence [...]. I mean, ideally, everything that we do and prescribe and recommend to patients has scientific evidence, and I think that's the main basis for Western medicine." (Swedish respondent)

Taiwanese medical practitioners emphasized that they are required by the government to possess specific qualifications and licenses, which obligates them to uphold accuracy and honesty in their profession. Additionally, they highlighted Western medicine's foundation on the notion of "evidence", which calls for continual revisions based on new research.

Theme 2: The views of medical doctors on alternative medicine

Based on the views expressed by Taiwanese participants, it can be inferred that alternative medicine is perceived as distinct from Western medicine. While the former is considered a natural means of disease prevention, the latter is often associated with conventional medical practices. However, it is noteworthy that alternative medicine is perceived to lack scientific "evidence", despite

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its potential benefits. These observations highlight the need for further research to evaluate the efficacy of alternative medicine and to elucidate its role in disease prevention and management. *"In my point of view, alternative medicine [is] just like an 'experience' medicine and formed by the imagination] and observations and lack of scientific study. I would say although there is a gap of some 'evidence' or some scientific procedural steps, other 'experiences' still tell [that] alternative medicine is based on 'experience'."*(Taiwanese respondent)

"I think Western medicine is 'evidence'-based. In contrast, I think alternative medicine to me sometimes comes from some 'experience.' It hasn't been investigated based on the statistical analysis of a collection of medical hypotheses." (Taiwanese respondent)

According to the Swedish participants, alternative medicine refers to a type of medical practice that finds its roots in Asian nations such as China or the Indian subcontinent. This type of medicine was deemed distinct from Western medicine due to its purported lack of "evidence". Although alternative medicine was acknowledged to potentially exhibit therapeutic effects, its discordance with Western medical practices was also noted.

"Alternative medicine... I don't have an understanding about it, but my concept[ion] about it is that it's basically the medicine or the part of the treatment which were before allopathy was recognized or something like I would say Chinese medicine or Ayurvedic."(Swedish respondent)

"Traditional (alternative) medicine [...] doesn't have to have the same degree of evidence-based [support ...] but I guess it's more common [in places] like China." (Swedish respondent)

Theme 3: Beliefs associated with alternative medicine

Both Taiwanese and Swedish medical practitioners have expressed their adherence to the principle of patient autonomy, even in cases where the patient expresses a willingness to experiment with alternative medicinal practices that may lack strong supporting "evidence".

"It's said in Taiwanese society [that] Western medicine can treat your symptoms, but if you want to change your body characteristics [or] your body metabolism, maybe Chinese medicine is better."(Taiwanese respondent)

As per the insights of medical practitioners from Taiwan, they display a readiness to hold talks related to alternative medicine with their patients. Furthermore, in cases where individuals express their desire to employ such treatments, these doctors suggest that they consult Chinese medicine specialists and avoid self-treatment.

"I [am] not against (alternative medicine), but because I am not specialized, [...] I can say my attitude is open. And, for example, most of the time patients ask 'Can I take Chinese medicine,' I [advise] them 'Please consult with [someone] qualified with Chinese medicine."(Taiwanese respondent)

Based on the perspective of medical experts in Taiwan, there are limitations to Western medicine, particularly its effectiveness when dealing with rare and long-term ailments. Consequently, if an individual decides to explore alternative medicine under such circumstances, healthcare providers in Taiwan do not intervene or prevent them from doing so.

"We cannot cure all of the pain, so I think I am very open. You can go to the massage [therapist]. You can go to the acupuncture [clinic] if it's helpful. I think it's not a problem. If my chronic pain patient wants to seek other help, I think it's okay."(Taiwanese respondent)

As per the assertions of Swedish medical practitioners, alternative medicine is not advocated for as it lacks substantial empirical substantiation. Nevertheless, in the event that a patient expresses the desire to utilize alternative medicine, it remains within their personal volition to do so.

"My perception is, you know, if somebody wants it, then they're the master of their own bodies, and they can go. I mean, [...] alternative medicine is not a new thing, you know. It has been [around] thousands of years. I think if one gets benefit, [..] okay, yeah, why not? I think, as a doctor, I will not recommend anything (alternative medicine) to a patient." (Swedish respondent)

Theme 4: Stigmas associated with alternative medicine

According to Taiwanese medical practitioners, alternative medicine often incurs higher expenses than its Western counterpart and the claimed advantages of such treatments may occasionally be exaggerated. Furthermore, in certain instances, patients may opt for alternative medicine due to apprehensions regarding surgical procedures, a decision which can result in a delay of treatment and a consequent exacerbation of the underlying ailment.

"I am not against [it], because sometimes [the] cost [of] alternative medicine is [much more] expensive compared to our (Western) medicine system."(Taiwanese respondent)

"Some information is correct, and some is not. They (patients) cannot judge correctly, because of the propaganda. [It is more] attractive than what the doctor said. That's why a lot of people's paycheck [goes] to buy these kinds of products, and it's [more] expensive than seeing the doctor at NHI (National Health Insurance). And it's a big market". (Taiwanese respondent)

Swedish medical professionals expressed skepticism regarding the effectiveness of alternative medicine, citing a dearth of "evidence" to support its claims, and warning that it may be a ploy to profit from illness. This viewpoint was further elucidated by a Swedish individual:

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"Something might work; something might be almost a fraud, like selling some kind of pills that are supposed to cure something; and it might be just phony to make money."

DISCUSSION

The interpretation of medicine and the concept of evidence can vary widely depending on the context in which they are discussed. The way that humans interact with their environment can shape how medicine is understood and applied, leading to different meanings in different communication settings [17]. This complexity is reflected in the concept of "evidence," which is typically understood as research-based findings that can inform healthcare decision-making. However, the interpretation of evidence is not straightforward, and can be influenced by a range of factors, including personal beliefs and prior knowledge. To complicate matters further, the process of generating evidence is itself subject to a range of different methodologies and approaches [18]. The generation of evidence is possible through the implementation of clinical trials, statistical analysis, analytical studies, published literature and reports. Interpretation of such evidence may be affected by various factors. These may include personal beliefs and biases, as well as the analytical methods used to interpret the data [18, 19]. Given this complexity, it is not surprising that there is often a lack of consensus around the meaning of "evidence" in Western medicine. Governing bodies play an important role in shaping the way that evidence is valued and interpreted, but even with clear guidelines in place, the interpretation of evidence can remain subjective and contested [19]. Taiwan and Sweden have healthcare systems that differ significantly due to their unique social, legal, and historical backgrounds [7, 20]. Consequently, they have varying approaches to patient care. However, despite these differences, medical professionals from both countries share a common understanding of evidence-based medicine, which emphasizes the use of clinical trials, experiments, meta-analysis, and expert opinion to inform medical practice. This approach helps to ensure that patient care is based on the best available evidence and helps to improve the quality of medical care. It is essential to acknowledge and appreciate these differences in healthcare systems as it allows us to learn from each other and improve patient outcomes. Alternative medicine is viewed differently by medical doctors in Taiwan and Sweden. Taiwanese doctors perceive it as lacking in scientific evidence, but based on personal experience, while Swedish doctors often associate it with non-allopathic approaches and Chinese or Indian medicine, and consider it lacking proper evidence. Despite these contrasting views, doctors in both countries use similar language and symbols to describe alternative medicine. The interpretation of subjective views on alternative medicine is a focus on symbolic interactions, which explore how individuals make sense of their world. Understanding these varying perspectives is crucial in promoting cross-cultural communication and facilitating informed decision-making regarding healthcare. Ultimately, this can lead to improved patient outcomes and a better understanding of the role of alternative medicine in healthcare [9, 10]. Symbolic Interactionism emphasizes the notion of "stigma," which connotes being discredited and perceived as deceitful, feeble-minded, domineering, aberrant, untrustworthy, or adhering to uncompromising convictions [21, 22]. In the context of alternative medicine, stigmas differ between Taiwan and Sweden. Taiwanese doctors view alternative medicine as having a higher cost compared to allopathic medicine and being associated with misleading propaganda, which can be stigmatizing. On the other hand, Swedish doctors express concern that alternative medicine may be used as a fraudulent way of making money, which carries its own stigma. Understanding the varying stigmas attached to alternative medicine in different cultural contexts is critical in facilitating effective communication and promoting informed decision-making about healthcare choices.

CONCLUSIONS

This study utilized symbolic interactionism to investigate the perspectives and interactions of medical doctors from Taiwan and Sweden with alternative medicine. The findings revealed that both groups of doctors shared a perception of Western medicine as evidence-based. However, Taiwanese doctors also viewed alternative medicine as experience-based, influenced by local cultural norms, historical context, and regulations

Authors Contribution

Conceptualization: MMFB
Methodology: MMFB
Formal analysis: MMFB
Writing-review and editing: MMFB

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

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Original Article

Effect of Nursing Care Practices Based on Clinical Interventions on the Incidence of Primary Post-Partum Hemorrhage in Females Undergoing Spontaneous Vaginal Delivery

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ABSTRACT

Post-Partum Hemorrhage (PPH) has many reported causes such as retained placenta, genital tract lacerations and uterine atony. **Objective:** To see effect of Nursing Care Practices based on Clinical Interventions on the Incidence of Primary Post-Partum Hemorrhage in females undergoing spontaneous vaginal delivery (SVD). **Methods:** In this study Pre & Post Study design was used. Sample size 196 was used respectively for Incidence of Primary PPH. In this study Sampling Technique Purposive was used. September 2021 to May 2022 was study duration in which study was conducted. Mothers who were advised to undergo Spontaneous Vaginal Delivery by an obstetrician. Females were including in this study whose maternal age was in years 20-50years. Females admitted to gynecology ward for lower segment caesarian section (LSCS) and Females diagnosed with Preeclampsia were excluded from the study. The Incidence Checklist for PPH was adopted with (Cronbach alpha = 0.89). **Results:** There was a significant improvement in the incidence of Primary PPH was 27.55% in females undergoing SVD before any change in nursing practices. However, the incidence decreased to 14.48% after clinical interventions in nursing care practices. **Conclusions:** Nursing Care Practices based on Clinical Interventions was effective. Clinical interventions in nursing care practices showed significant improvement. Furthermore, it also reduces the incidence of Primary PPH and ultimately decreases hospital stay.

INTRODUCTION

When a blood loss exceeds 500 mL is known as Primary Post-Partum Hemorrhage (PPH) which was takes place within 24 hours of delivery. Primary PPH is responsible for 40% of maternal deaths in emergent countries [1]. Primary PPH normally happens throughout; 3rd & 4th stages of labor, birth of an infant with a placenta & two hours after delivery. In low-income developing countries Primary PPH is responsible for 40% of maternal deaths. There have been observations about miscalculation of blooding by healthcare providers after delivery. Nurses as healthcare providers can perform many tasks that can considerably minimize the incidence of primary PPH but due to limited scope and over workload in government hospitals, therefore tasks not being carried out by nurses properly [2]. Around 13 to 30% of females suffer Primary PPH soon after delivery with more than 500 ml of blood loss, however, 4-7% bleed up to 1000 ml. More than half (>60%) of the pregnant females in Africa suffer anemia during pregnancy. Unfortunately, if they end up with primary PPH, they don't have much reserve in the body. Therefore, primary PPH must be prevented and treated timely for a safe maternal outcome. To ensure a safe maternal outcome, it is of all importance that healthcare providers should have the sound skill to deal with pregnant females. Conversely,

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several births are still not attended by qualified health experts [3]. Similarly, primary PPH has caused approximately 40% of maternal deaths globally. Despite the massive funding that has been done in maternal and child health by different international organizations such as the World Health Organization (WHO), the United Nations (UN), the United Nations International Children's, the United Nations Population, and the World Bank Group. Yet it is estimated that around 300,000 mothers died in 2019, out of which 90% of deaths were reported in developing countries [4]. It has been frequently seen that even when the amount of hemorrhage is very low and gradual, it can still progress to remarkable blood loss which can lead to shock. It might happen due to the remaining tissues inside the reproductive organs, if not removed completely [5]. Around 13 to 30% of females suffer Primary PPH soon after delivery with more than 500 ml of blood loss, however, 4-7% bleed up to 1000 ml. More than half (>60%) of the pregnant females in Africa suffer anemia during pregnancy. Unfortunately, if they end up with primary PPH, they don't have much reserve in the body. Therefore, primary PPH must be prevented and treated timely for a safe maternal outcome. To ensure a safe maternal outcome, it is of all importance that healthcare providers should have the sound skill to deal with pregnant females. Conversely, several births are still not attended by qualified health experts [3]. Maternal morbidity and mortality in low & high-income countries is high due to PPH. This is known as a leading cause. Although, it has become less fatal in high-income or developed countries due to advancements in treatment modalities. However, it is still known as an obstetric emergency that occurs after a vaginal delivery within 24 hours [6]. Primary prophylaxis helps reduce average postpartum blood loss and reduce the incidence of postpartum bleeding [7]. According to one study, only one-third of nurses reported having awareness about uterine massage which is part of aggressive management [8]. On the other hand, despite having these Contributing issues, mostly females never develop Primary PPH. The only intervention known to prevent PPH is AMTSL. At that time risk factors for Primary PPH include increasing maternal age, fetal macrocosmia, primiparity, multiple gestations, and history of cesarean section, extended labor, fibroids and episiotomy [9]. A study was conducted in Tanzania to assess knowledge and practices among nurses regarding the prevention and management of primary PPH. A total of 152 nurses were enrolled out of which only 44.8% had sufficient knowledge and only 38.4% of them had appropriate skills in the prevention and management of primary PPH [10]. Primary PPH can be prevented through identifying signs and symptoms, proper assessment of blood loss, and better practices by healthcare providers such as sound knowledge and skills [11]. During spontaneous vaginal delivery, nurses are responsible for administering intravenous (IV) fluids; volume expanders; blood products as instructed; and obtaining blood samples for essential baseline lab investigations. To improve nursing care practices, a nurse should be assigned to a limited number of patients with training to regularly examine and record the mother's vital signs, calculate vaginal blood loss, and assess uterine tone and size [12]. Empirical studies on PPH prevention show that approximately 75% of maternal deaths had been attributed to insufficient teamwork and communication in clinical settings. On the other hand, good teamwork and communication have a positive effect on the care provided in delivery rooms by nurses [13]. In the United States (US), the incidence of Post-Partum Hemorrhage has been increasing at a shocking rate. Between 1999 to 2012 The incidence of Primary PPH increased by 30% which was attributed to uterine atony. This increase was thought to be some unknown cause. Few other studies reported the prevalence of Post-Partum Hemorrhage as 15%, indicating an urgent need for intervention to address this phenomenon [14]. The rationale of this study is that in the labor room and gynecology wards there is often a miscalculation of blood loss after delivery. Furthermore, many essential practices should be performed during labor such as fundus massage, control cord traction (CCT), and administration of oxytocin soon after delivery, which are not seen in routine practices in public sector hospitals. According to records of the study setting, it is estimated that about 10-15% of females end up with primary PPH which could be minimized by improving nursing care practices regarding the third and fourth stages of labor in females undergoing spontaneous vaginal delivery (SVD) [15].

METHODS

Pre and post-test Quasi-experimental study design was used. Sampling technique Purposive was used in this study to meet study objectives. The study was conducted on admitted Patients of the Gynecology department of Allied Hospital Faisalabad, Pakistan (Faisalabad Medical University). After approval was taken from the University. Which was situated in Lahore Pakistan (IRB-UOL-FAHS/932//2021). Study duration was 9 months from September 2021 to May 2022.Females undergoing SVD, a sample size of 196 was calculated with a 95% confidence interval, a 5% margin of error, and an expected percentage of a decreased incidence of Primary PPH of 15 % [15]. Before Participation informed Consent was signed by all participants. All information was kept Confidential after taken from them. In this study females age 20-50 years

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were included. Mothers who were advised to undergo Spontaneous Vaginal Delivery by an obstetrician also included in this study. Those Females were already diagnosed with pre-eclampsia and admitted for LSCS also excluded from the study. This checklist consists of demographic and incidence of primary PPH information. The demographic information included age, occupation, gravida, education, and medical History. Whereas, the following section measured the incidence of Primary Post-Partum Hemorrhage. The presence of Primary PPH which was categorized as: Mild bleeding if the amount was <400ml. Moderate bleeding if the score was 400ml-500ml. Severe if the score was >500ml. The incidence of Primary Post-Partum Hemorrhage was marked "1" if the bleeding was >500 ml and "0" if ≤500.At working place Participants were assessed by Clinical assessor through maintaining their privacy. Clinical interventions were given in 16 weeks. Each group was involved in intervention 6 days a week (Monday to Saturday). The intervention was delivered by a researcher and 2 gynecologists. The intervention consists of 1-1.5 hours of educational sessions followed by practices in clinical areas in the following days. For instance, a group of participants who received educational sessions on Monday will be observed to ensure its implementation on the following days for 16 weeks. On average, each group received a total of 20 hours of educational sessions followed by 16 weeks of clinical care exposure in the presence of experts (gynecologists) Furthermore, out of 7 groups, 5 groups received educational sessions on Mondays to Fridays. Whereas; groups 6 and 7 received educational sessions on Saturdays of each week. To ensure that the participants were implementing the practices in clinical areas after receiving educational sessions, three nurses from non-gynecology departments were trained to observe them. The participants were provided with handouts to guide them in need. All the educational sessions were given in the classroom of Gynecology unit 1 for all groups. Moreover, during the session PowerPoint presentations, skits, videos, and scenarios were presented to the participants to boost their critical thinking and problem-solving skills. The intervention was developed using literature and books on nursing care practices and primary post-partum Hemorrhage. In the post-assessment phase, the data were collected after 15 days of intervention completion through the same adopted incidence of Primary PPH checklists from patients, respectively. The Incidence Checklist for PPH was adopted by the researcher for (Cronbach alpha = 0.89). Data were collected through a structured checklist. It was entered and analyzed in SPSS version 24.0. Quantitative variables were presented in Frequencies, Percentages. the Chi-Square test was applied to Compare Pre and Post Incidence of Primary Post-Partum hemorrhage in females.

RESULTS

Table 1 shows that 53(27.0%) patients were aged between 20-25 years, 59(30.1%) patients were between 26-30 years, 55 (28.1%) of them were between is 31-35years, and 29 (14.8%) were aged between 36-40years. Furthermore, 56 (28.6%) and 140(71.4%) patients presented had primary and multi-Gravida, respectively. In regards to occupation, 27 (13.8%) females were employed, whereas, a majority of 169 (86.2%) females were housewives. Similarly, about the education, 30(15.3%), females had primary education, 35(17.8%) had secondary (matriculation), 36(18.4%) had intermediate and above, whereas, 95(48.5%) participants were uneducated.

Table 1: Demographic Characteristics of Participants (Patients, n=196)

Demographic Characteristic	Frequency (%)
Age (Years)	
20-25	53(27)
26-30	59(30.1)
31-35	55(28.1)
36-40	29(14.8)
Education	
Primary	30(15)
Matric	35(18)
Intermediate & above	36(18)
Un-educated	95(49)
Gravida	
Primary Gravida	56(28.6)
Multi-Gravida	140(71.4)
Occupation	
Employed	27(13.8)
Housewife	169(86.2)
Total (each characteristic)	196(100)

Table 2 demonstrate that majority patients were having no illness 128(65.3%) although 11(5.6%) were hypertensive and 37(18.9%) were anemic as well as 7(3.6%) were diagnosed with diabetes, 2(1.0%) had a history of heart disease, 5(2.6%) had blood clotting disorder, whereas 6(3.1%) of them did not want to disclose their disease so researcher put them in others.

Table 2: Medical History of Research Participant (Patients n=196)

Conditions	Frequency (%)
No Illness	128(65.3)
Hypertension	11(5.6)
Anemia	37(18.9)
Diabetes	7(3.6)
Heart Disease	2(1.0)
Blood Clotting Disorder	5(2.6)
Others	6(3.1)
Total	196(100)

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As shown in Table 3, in pre-interventions period majority of patients had mild blood loss during delivery 118(60.2%) which decrease to 107 (54.6%) after the intervention. On contrary, 24(12.2%) patients had moderate blood loss during delivery in pre-intervention which, however, increased in 61(31.1%) patients after the intervention. Interestingly, 54(27.5%) patients had severe blood loss during delivery in pre-intervention which significantly decreased in almost half of 28(14.3) patients as compared to patients who fall in the severe category.

Table 3: Categories of Blood Loss before and After the Intervention

	Frequency (%)	Frequency (%)
Mild <400ml	118(60.3)	107(54.6)
Moderate 400-500ml	24(12.2)	61(31.1)
Severe >500	54(27.5)	28(14.3)
Total	196(100)	196(100)

As shown in Table 4, there were a total of 54 (27.5) patients who developed PPH (>500ml blood loss) before any intervention in nursing care practices, however, this number decreased significantly by 28 (14.3%) after the nursing care practices were improved following administration of intervention. Incidence of Primary Post-Partum Hemorrhage was significantly decreased after the intervention as compared to the pre-score. Therefore, it can be concluded that there is an effect of nursing care practices based on clinical intervention on the incidence of primary PPH as evident by the p-value <0.01.

Table 4: Comparison of Incidence of Primary Post-Partum Hemorrhage Pre & Post Intervention (n=196)

PPH Status	Pre-Intervention Frequency (%)	Post-Intervention Frequency (%)	p-value
Developed (bleeding >500ml)	54(27.5)	28(14.3)	<0.01
Not developed (bleeding <500ml)	142(72.5)	168(85.7)	
Incidence per hundred patients over 6 months	27.55	27.55	

DISCUSSION

Demographics of patients (participants) in current study majority of the participants age ranges 26-30 years 59(30.1%). Mostly participants were uneducated 95(49%). Mostly females were multigravida 140(71.4) and most of them were housewife's 169(86.2). The findings of the current study were similar to the study were conducted in Ethiopia in 2021. Incidence rate was 12.5% in this study [6]. The findings of current study were contradicted to another study which was conducted in Tanzania. The incidence rate was 7% due to educational interventions for 16 weeks regularly [16]. Supporting one interventional quasi-experimental single group study conducted in South Nigerian Hospital, Nigeria (2019). Its results also showed significant results as compare to current study. Current Study results compare to another study by Kebede *et al.*, where pre-intervention incidence rate of Primary Post-Partum Hemorrhage was 35% which was decreased to 15% after interventions [17]. One more Contradictory study was conducted in a government tertiary hospital in Japan (2019). The incidence rate for Primary Post-Partum Hemorrhage in this study was 8.7% Because in this study sample size was small as compare to current study so through interventions their patient's outcome was more improved [18]. To improve students' knowledge skills and practices for better patient outcomes and enhance their confidence must arrange student-centered approaches on regular basis through evidence base practice [19]. During the fourth stage of labor, many life-threatening problems develop, which can be avoided with diligent nursing attention. Furthermore, the majorities of Post-Partum Hemorrhage difficulties arise while untrained health worker performs delivery with minor or zero expertise in labor for prevention of Primary Post-Partum Hemorrhage [20].

CONCLUSIONS

Results showed significant improvement related to nursing care practices to reduce incidence of Primary PPH in statistical Analysis. Therefore, an improvement in the nursing care practices through clinical interventions during the third stage of labor for females during delivery and also ensuring proper follow-up of practical skills during delivery is very helpful to developing healthy maternal outcomes. This reduces the incidence rate of PPH in females and the duration of hospital stay is also reduced.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Oral Health Status of Children Age 6-12 Years in Rawalpindi, Islamabad Pakistan

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ABSTRACT

Dental caries seems to be a significant public health issue and a common non-communicable disease. And is more prevalent in age group 6-12 years. There has never been a national oral health survey conducted in Pakistan between age 6-12 years in recent years. The purpose of this study was to look into the dental health of children between the ages of 6 and 12. **Objectives:** To determine the oral health status of children age 6-12 years using Decayed, Missed, Filled tooth Index. **Methods:** A cross-sectional study was carried out which included 385 children age between 6-12 years, using a simple random sampling. Children were evaluated in schools, and data collected included details on caries and the condition of the gingiva. The WHO's methodology and standards were used for oral examination. **Results:** Mean DMFT index of children age 6-12 years came out to be 2.28 ± 0.97. More than 2/3rd of children age between 6-12 years needs urgent dental care. **Conclusion:** The oral health status of children age between 6-12 years is unsatisfactory and higher DMFT index than expected. To effectively prevent and control burden of dental caries and promote gingival health, the oral health program must be implemented.

INTRODUCTION

WHO states that 4 important chronic diseases cardiovascular issues, cancer, chronic respiratory conditions, and diabetes hare risk factors with oral disease [1]. Dental caries is the most prevalent chronic condition in children today, affecting 51% of pre-scholars in Pakistan as of 2012 data [2]. Children who have this non-communicable, non-infectious condition may experience extreme discomfort, face infections, slower physical growth, and difficulty learning. Children do not consume enough nutrition because of mouth pain. Schoolchildren with a higher prevalence of caries skip more lessons than those with good oral health, which has an impact on their capacity to study [3]. Among children of various populations, gingivitis prevalence rates range from 35% to 100%, according to epidemiological research [4]. Given that it affects 60–90% of school-aged children and the vast majority of adults, dental caries is still a serious health issue (WHO 2004). The incidence of caries is significantly rising in developing nations due to changing food habits and lifestyles [5]. Preschoolers frequently develop early

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childhood dental caries, which is also linked to their oral health-related behaviours, socioeconomic background, parental education, and dental knowledge [6]. According to WHO dental caries is the third most common oral diseases that is not communicable [7]. Dental caries, which are five times more common than asthma and seven times more common than hay fever in children, are determined to be the most common childhood ailment in Pakistan, where oral health trends have produced dismal results [8]. According to the most recent scenario analysis, published in 2004 in Pakistan, the total DMFT scores among permanent dentition of 12-year-olds in rural areas were found to be 1.59, increasing to 2.26 in 15-year-old children, 8.73 in 35 to 44-year-old adults, and 18.9 in people age 65 and over [9]. But no researches have been made after that in Pakistan to evaluate the oral health status of 6-12 years. Our study's goal was to determine the prevalence and severity of dental caries, gingivitis, and the treatment needs.

METHODS

This cross-sectional was conducted on children age between 6-12 years in Rawalpindi, Islamabad Pakistan. Government and private schools were identified, and a simple random sampling procedure was used to fill out the requisite sample. As there are no statistics, we used the WHO tool to calculate the sample size and used 50% prevalence. The total number of samples was 385.Before the study began, all participants were given complete study material, including the study's aims, objectives, and explanations. They were also required to sign an informed permission form. Inclusion criteria includes all participants of age between 6-12 years, all those who give informed consent and both primary and mixed dentition were included. Exclusion criteria include, mentally retarded students, hospitalized, injured students, unerupted tooth. The total number of decayed, missed from caries, and permanently lost teeth is known as the DMFT. The DMFT index values were distributed as follows: score 0 indicates that a person is healthy or has no caries; score 1 describes mild caries; score 2 describes moderate caries experience; score 3 indicates severe caries; and score 4 indicates very severe caries level of respondents. A modified questionnaire was used to gather the data, and skilled dentists interviewed the participants before recording and entering their responses in SPSS. Fresh dentists received training on how to document oral examination results. The patient was seated in a school chair while the oral examination was conducted with tactile stimulation and in natural light. SPSS version 26.0 for statistical analysis was employed. Descriptive analysis was performed, Percentage and mean values were determined. DMFT values of 0.0-1.1 are extremely low, 1.2-2.6 are moderate, 2.7-4.4 are high, and >6.6 are extremely high.

RESULTS

A total of 385 children were examined. The gender ratio was equally distributed as male (53%) and female (47%). Gender distribution as seen in table 1.

Table 1: Gender distribution of respondents

Variables	Percentage
Male	Male
Female	Female
Total	Total

Furthermore, as figure 1 explains as, 1st group of 6 years of age had 70 (18.1%) respondents, 2nd group of 7 years of age had 80 (20.7%) respondents. 3rd group was of 8 years of age had 75 (19.4%) participants, 4th group was of 9 years of age had 60 (15.5%), 10 years of age had 50 (12.9%) of respondent's 5th group of age 11 years had 30(7.7%) and last 12 years had 25(6.4%).

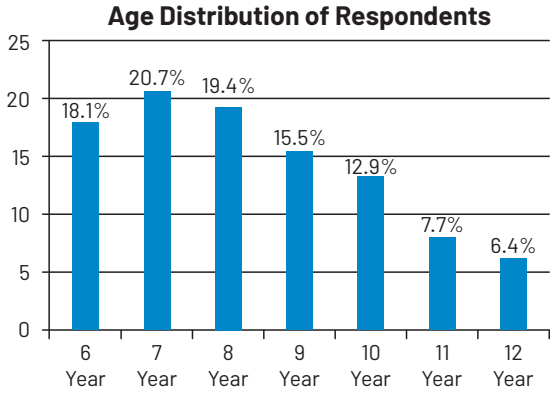

Figure 1: Age distribution of respondents

Table 2 explains as 120 (31.1%) had code 1 and were healthy, 220 (57.1%) had code 2, 40(10.3%) had code 3, only 5(1.2%) had code 4 and none of them had code 5. Prevalence of dental caries among age 6-12 years was found to be 68.9%. which was more than as found in research performed in Karachi where prevalence came out to be 51%. DMFT of the students were assessed and results as follow.

Table 2: DMFT index of Respondents

Code	DMFT index score	Frequency (%)
1	Healthy	120(31.1)
2	1 to 7	220(57.1)
3	8 to 14	40(10.3)
4	15 to 21	5(1.2)

Table 3 explains the Mean and Standard Deviation values of 6-12 years of children in Rawalpindi, Islamabad and came out to be 2.28±0.907. More than 2/3rd of children age between 6-12 years needs urgent dental care.

Table 3: DMFT index of the Participants

Index	Frequency	Mean ± SD
DMFT index	385	2.28 ± 0.907

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DISCUSSION

The total no of children examined were 385 ages between 6 to 12 years. Our study's findings showed that 68.9% of children aged 6 to 12 had dental caries, which is around 2/3rd of the population. Our results were not in accordance with the objectives set by the WHO and the Federation of Dentistry International, which called for 50% of children between the ages of 5 and 6 to be caries-free and a global average of no more than 3 DMFT by the age of 12, as more than 68% were carious but we were able to maintain DMFT less than 3 [10]. The high consumption of sugary products at this age contributes to the high burden of caries index, because 90% of the children had no knowledge about relation between caries and sweet products. A study conducted in Ethiopia also demonstrated that kids who consumed a lot of sweets had a high risk of caries [11]. Our results were in accordance to a study carried out in India where prevalence of dental caries in age between 6-12 years was found as 71.8% [12]. Our results were not in accordance to a study carried out in China to evaluate oral health status of 12 years age children where prevalence of caries index was found to be 83.7% this was due to high sugar consumption and no or less brushing habits [13]. Our research was also in accordance to a study by Jipa and Amariei carried out in Danube Delta Biosphere Reserve where overall mean DMFT was found to be 2.01 [14]. Dental care and dental health education are shown to be in the highest demand among age 6-12 years. The reason could be because these children lack access to oral healthcare, their lifestyles have changed, making it easier for them to consume sugar-rich foods and fizzy drinks, which has led to an increase in unmet treatment needs. It could also be because these children have poor oral hygiene habits and inadequate dental knowledge and supervision [15]. Our results were not in accordance to a study carried out in Malaysia where 83.7% brush their teeth twice a day with fluoride toothpaste but in our case less than 0.1 had same routine of brushing [16]. While kids spend the majority of their time outside, being able to eat correctly is crucial for providing energy for daily activities. In this study, the most prevalent oral health issues mentioned included toothaches, dental caries food impactions in cracked teeth, erupting permanent teeth, cavities and sleep disturbances. These disorders impeded the kids from correctly chewing their food, which in turn reduced their quality of life. Our results were not in accordance to a study carried out on 6-12 years of age Yunnan province of China where 61% had bleeding gums but in our case, we had only 10% with bleeding gums this is because of high caries rate in that area. our results of prevalence of dental caries in 1st molar 27% were in accordance to their as 25.2% [17]. Our results were not in accordance with a study carried out in Madrid Spain where prevalence of dental caries was found to be 37.6% this might be due to small sample size in their research [18]. Our results were in contrary to a similar study by Bassa *et al.*, was carried out in Ethiopia where prevalence of dental caries was found to be 15.6% this might be due to regular milk consumption, less sweet food consumption, good parental education, and satisfactory tooth brushing behavior [19]. Our results were in accordance to a study carried out in Jordan where prevalence of dental caries in 6-12 years of age group was found to be 76.4% [20].

CONCLUSIONS

The oral health status of children age between 6-12 years in Rawalpindi, Islamabad was unsatisfactory and higher DMFT index than expected. Dental caries was a significant dental public health issue in Pakistan. To effectively prevent and control burden of dental caries and promote gingival health, the oral health program must be implemented. Future programs must focus on younger age groups of children to encourage good oral hygiene habits, lower caries, and enhance quality of life. Comprehensive prevention initiatives regarding increasing awareness of oral, and dental health should be implemented.

Authors Contribution

Conceptualization: MFH
Methodology: JK, DYS, FD, MN, FH, RY
Formal analysis: AP, SAR, NB
Writing-review and editing: MFH

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Effectiveness of Adapted Program for the Education and Enrichment of Relational Skills (PEERS) in Adolescents with ASD

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ABSTRACT

PEERS® for Adolescents is an evidence-based social skills intervention for autistic youth and adolescents with other social challenges. **Objective:** To examine the effectiveness of the PEERS intervention in Pakistani adolescents with ASD. **Methods:** Total 98 parents (Mage = 41.60, SD = 3.90), and 63 teachers (Mean age = 36.63, SD = 7.80) of 98 adolescents (Mean age = 14.39, SD = 1.80) with ASD were recruited from two schools of Islamabad and one school of Rawalpindi via purposive sampling. **Results:** Findings demonstrated significant improvements in social skills knowledge of adolescents with adopted PEERS, *F (1, 93) = 36.38, p<.001*. **Conclusions**: Results indicated that PEERS is an effective program to enhance the overall socialization of Pakistani Adolescents with ASD.

INTRODUCTION

Autism spectrum disorder (ASD) is a group of neurodevelopmental disorders that causes social and behavioral issues. ASD is "impaired social, linguistic, and behavioral development that is often manifested before age 3 years and frequently coexists with abnormalities in cognitive functioning, learning, attention, and sensory processing" [1]. The Diagnostic and Statistical Manual of Mental Disorders, states that people with ASD have symptoms that make it hard for them to function in school, work, and other areas of their lives [2]. These include repetitive actions, limited interests, and problems socializing and communicating. ASD affects all races, ethnicities, and socioeconomic groups. Even though ASD is a lifelong disorder, programs and treatments can help children's symptoms and daily functioning. Caregivers should discuss ASD screening and evaluation with their doctors. Social impairment, a hallmark of many neurodevelopment diseases, affects ASD patients at all cognitive and linguistic levels [3]. Low socioeconomic status, high prenatal issues, and poor maternal and newborn health services may explain this higher rate of learning challenges. However its frequency is rising in developed countries, with 1 in 110 children diagnosed with autism [4]. Conversely, the condition is just being known in Pakistan. Due to the intimate association between learning disabilities and autism, many Pakistani studies have found higher prevalence of both. 6.5% of 6,365 children in a cluster sample study had mild mental impairment, whereas

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1.9% had considerable cognitive handicap [5, 6]. Adolescence phase can be difficult for children with ASD since they are more motivated to socialize with their peers but also more aware of their social disability [7]. Poor social skills often lead to peer rejection and victimization, inadequate social support, a lack of fulfilling friendships, feelings of loneliness and isolation, difficulties in school and work, and the development of anxiety and mood disorders [8, 9]. This vulnerable demographic needs thorough social skills training during adolescence. Social skills intervention programs for adolescents with ASD are becoming more popular, however research suggests they do not improve social outcomes [10]. Programs that show potential have limited generalization and short treatment advantages [11, 12]. Reichow and Volkmar reviewed evidence-based social skills therapies and found many treatment delivery strategies that could improve social outcomes for ASD patients [12]. Applied behavior analysis, naturalistic methods, parent and family participation, peer training, group therapy, visual aids, and video modelling can help teach social skills. Behavioral rehearsal exercises, coaching with performance feedback in small groups, and time-limited social skills instruction using behavioral modelling and role-play demonstrations are all effective intervention strategies for teaching social skills [13]. Evidence-based treatment manuals, didactic training using social etiquette norms and stages, and in-person socialization homework assignments improve treatment outcomes for adolescents with ASD [14-16]. Clinical investigations have indicated that the PEERS program improves social functioning in adolescents with ASD. The Program for the Education and Enrichment of Relational Skills (PEERS) uses CBT teaching methods. UCLA's evidence-based social skills curriculum teaches relationship development, peer dispute, and peer rejection. Laugeson *et al.,* found that adolescents who participated in the program had improved social skills as reported by parents, increased knowledge of social skills, and increased frequency of hosted peer get-togethers compared to a waitlist control group [15]. Treatment gains were maintained five years later [17]. Another study found that adolescents who participated in the PEERS program improved their social cognition, social awareness, social motivation, assertiveness, cooperation, responsibility, knowledge, and responsiveness in these areas, reduced autistic mannerisms, and increased peer interactions [18]. Thus, Overall, the PEERS program has had favorable results, although more research is needed as it is still young. This study examines the program's influence on a Pakistani community. Hence present study aimed to adapt and introduce the adapted UCLA PEERS model in educational setups in Pakistani schools in order to improve Pakistani adolescents' adaptive behavior skills, social skills, and quality of play by involving primary careers such as parents and teachers. Objective of this study was to evaluate the effectiveness of the adapted UCLA PEERS model in experimental group. Hypothesis states that there is likely to be a significant improvement in post social skill knowledge with respect to pre assessment, after the training of participants of with adapted UCLA PEERS model in experimental group.

METHODS

Experimental research design and purposive sampling technique was used in the present study for the recruitment of the participants. Total 98 parents and 63 teachers of 98 adolescents with ASD were recruited from two schools of Islamabad and one school of Rawalpindi. An introductory session has been conducted in a group to inform the participants about the purpose of the study (See table 1 for complete descriptive statistic). A total of 57 parents of 57 adolescents with ASD and 31 teachers of these adolescents showed their interest to be part of an experimental group (EG). Whereas, remaining 41 parents of 41 adolescents with ASD and 32 teachers of these adolescents became part of the control group (CG). Adolescents (who were able to communicate verbally and had been diagnosed with mild ASD), Parents and teachers of adolescents with mild ASD diagnosis, who were proficient in English language, and those who provided signed consent form to take part in the adapted version of UCLA PEERS, were included in the study. Children, adolescents and adults (who weren't able to communicate verbally and had been diagnosed with moderate to severe ASD), and Parents and teachers of children, adolescents and adults with other intellectual or neuro-developmental disability (e.g. ADHD, severe ASD), and who were not proficient in English language. Study use demographic data sheet constructed by author that include age, gender, education, family system, socioeconomic status, occupation and number of children. Moreover, the TASSK questionnaire that was originally that was developed by Norris *et al.,* was used to measure pre and post assessment of social skill knowledge of participants [19]. Scores range from 0 to 26, with higher scores indicating stronger understanding of adolescent social skills. The test is treatment-sensitive, with a Cronbach's alpha of 0.56 [20]. This study included total of 98 parents and 63 teachers of 98 adolescents with ASD which were recruited from two schools of Islamabad and one school of Rawalpindi. An introductory session with each parent and teacher has been conducted in a group form, to inform the participants about the purpose of the study. Parents and teachers were the main participants, who participated in the adapted

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UCLA PEERS program and they were assigned activity sheets and homework assignments to deliver the learned social skills to the adolescents with ASD. After taking formal permission from the original author, PEERS program manual was adopted according to indigenous culture. Afterward, the adapted UCLA PEERS program was implemented on the parents and teachers of adolescents. Aim of the study was described in terms of confidentiality concerns, anonymity of the participants and their right to withdraw from participating in the adapted UCLA PEERS program. Pre assessment of participants was done on social knowledge questionnaire. The Adapted UCLA PEERS model included 14 weekly sessions (1 session per week). These sessions mainly involved parents and teachers to enhance the comprehensive knowledge, understanding and quality of socialization of adolescents with ASD. A trained therapist, who was certified in UCLA PEERS model by the developer of original UCLA PEERS model (Dr. Laugeson), educated the parents and teachers about conversational skills, peer relationships, rejection and problem-solving skills and therapist provided homework assignments to both teachers and parents along with the activity sheets throughout the intervention phase. Afterward the post assessment was done on same participants. Ethical considerations were considered particularly while conducting this research. Permission and approval from the Research Ethics Board, Institutional Review Board, author of the scales and significant authorities was taken before conducting research. Every participant of the research received a consent form along with the brief description about the aim of the present research. Only those participants were considered as the part of study who were interested to take part in the present research.

RESULTS

Table 1 shows Mean ± SD and frequency(%) of demographic characteristics of participants.

Table 1: Demographic characteristics of the participants

Variables		Adolescents		Parents		Teachers	
		M(SD)	f(%)	M(SD)	f(%)	M(SD)	f(%)
Age		14.39(1.80)		41.60(3.90)		36.63(7.80)	
Gender	Male		47(48)		63(64.3)		59(93.7)
	Female		51(52)		35(35.7)		4(6.3)
Education		8.03(1.42)		16.31(2.15)		17.49(1.76)	
No. of siblings	One		14(14.3)	-	-	-	-
	Two		38(38.8)	-	-	-	-
	Three		38(38.8)	-	-	-	-
	Four		8(8.2)	-	-	-	-
Birth Order	First		37(37.8)	-	-	-	-
	Middle		48(49.0)	-	-	-	-
	Last		13(13.3)	-	-	-	-
Children with Autism	One	-	-		86(87.8)	-	-
	Two	-	-		12(12.2)	-	-
Autism Diagnosis Age		-	-	2.95(0.94)		-	-
Living Status	Nuclear	-	-		58(59.2)	-	-
	Joint	-	-		40(40.8)	-	-
Working Status	Working	-	-		28(28.6)	-	-
	Non-working	-	-		70(71.4)	-	-
Yes		-		12(12.2)		-	-
No		-	-	86(87.8)			

Results showed the adolescents who received UCLA PEERS intervention showed significant improvement in social skills knowledge in post assessment, as compared to the pre assessment (Table 2). However, no change was observed in social skills knowledge for the adolescents who did not receive the UCLA PEERS intervention across pre a post assessments with $F(1, 93) = 41.23$, $p < .001$.

Table 2: Mixed (2x2) Factorial ANCOVA for Pre-Post Assessments of Social Skills Knowledge across

Variables	Experimental Group		Control Group		F (1, 93)	P	$\eta 2$
	Pre	Post	Pre	Post			
	M ± SD	M ± SD	M ± SD	M ± SD			
Social Skills Knowledge	8.67 ± 1.46	20.25 ± 3.67	9.02 ± 1.56	16.30 ± 4.30	41.23	.00	.30

It was hypothesized that experimental group will show significant improvement in social skill knowledge with respect to the adapted UCLA PEERS model's outcomes.

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Pre and Post assessments was done on social skills knowledge across experimental (EG) and control Groups (CG) of the adolescent with ASD. The interaction effects of groups (EG & CG) and assessments (pre & post) was found to be significant with the knowledge of social skills of adolescents with ASD (Figure 1).

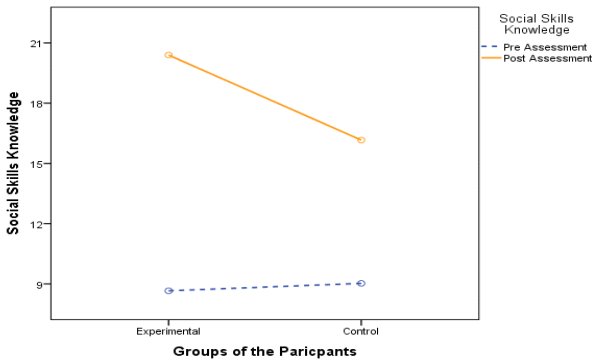

Figure 1: Interaction Plot of Pre-Post Assessments of Social Skills Knowledge across Experimental and Control Groups of the Adolescent with Autism Spectrum Disorder

The results of two-way mixed factorial ANOVA showed that the significant main effect for Groups (EG & CG) across social skills knowledge for adolescent with autism spectrum disorder.

DISCUSSION

Current study aimed to adapt and introduce the adapted UCLA PEERS model in educational setups in Pakistani schools in order to improve Pakistani adolescents' adaptive behavior skills, social skills, and quality of play by involving primary careers such as parents and teachers. This was done in order to assist Pakistani adolescents with ASD in a manner that was more accurate and consistent. Children with autism will benefit from this technique since it will help them become resourceful enough to speak, grasp, and carry on a good discussion. Present study hypothesized that there would be a significant improvement in post social skill knowledge with respect to post assessment after the training of participants with adapted UCLA PEERS model in experimental group. The interaction effects of groups (EG & CG) and assessments (pre & post) was found to be significant with the knowledge of social skills of adolescents with ASD (Figure 1). Results showed the adolescents who received UCLA PEERS intervention showed significant improvement in social skills knowledge in post assessment, as compared to the pre assessment (Table 2). Several studies reported that UCLA PEERS improved social skills knowledge [21-23] and social skills [24] after participation in UCLA PEERS intervention [25-26]. Another comparative study revealed that UCLA PEERS is an evidence-based social skills training which resulted in improved social skills knowledge and reduced social skills impairment [27]. At a 14-week follow-up evaluation, teachers reported improved social skills and parents reported a decrease in problem behaviors, particularly self-control and externalizing behavior [21]. Another research found that the PEERS program reduced social anxiety symptoms [28]. Another study found that the PEERS program for high-functioning middle school and high school adolescents with autism spectrum disorders improved social skills more in children with higher baseline social skills and lower self-reported perceived social functioning [29]. Findings of adolescent's self-reports indicated significant improvement in social skills knowledge and frequency of hosted and invited get-togethers with peers, and parent reports suggested a decrease in adolescents' social skills deficits [30]. Additionally, a recent study also concluded a significant improvement in social skills knowledge and overall socialization skills of adolescents with ASD after participation in the UCLA PEERS program [31]. Moreover, UCLA PEERS efficacy study was performed by Laugeson et al., [15]. A total thirty-three ASD teens were randomly allocated to the PEERS group or a general social skills training group. The PEERS course helped teenagers understand nonverbal communication and social idioms better than the control group. Furthermore, Laugeson et al., in another study examined the long-term impact of PEERS on social skills and functioning [18]. 47 PEERS-enrolled ASD adolescents were observed for 14 weeks. Adolescents maintained their social skills knowledge six months following the session. The teenagers also improved socially, including social responsiveness and autism symptoms. In a recent study, Mandell compared PEERS to a control group getting normal treatment [32]. The study randomly allocated 152 ASD teenagers to the PEERS program or the control group. The PEERS course helped teenagers grasp emotions and social norms better than the control group. Hence, it's been proved that the UCLA PEERS model is an effective treatment plan to improve social skills knowledge in adolescents with ASD.

CONCLUSIONS

The results concluded that the adapted UCLA PEERS intervention is an effective measure to enhance social skills knowledge, quality of socialization and social dimensions along with the improved general health. Quantitative tools were used to gather data, but a mixed approach could have provided more insight. Adolescents could have shared their stance with parents and teachers, and 1-5 years of follow up is needed to examine the long-term effectiveness of the program. Moreover, explorations of cross-cultural validation trials are needed. This research

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will make a contribution to the treatment of children with ASD who have impairments in their social skills. It will provide valuable information for parents, teachers, psychologists, and mental health workers to practice the UCLA PEERS model to develop social skills, adaptive behavior skills, and the quality of play in children. It will also make it easier for mental health professionals to deal with a decline in developing social skills. The findings of this study will have a lasting effect on Pakistani society, particularly in the areas of autism spectrum disorder (ASD) management and the improvement of teenagers' overall social functioning.

Authors Contribution

Conceptualization: S, RA
Methodology: S, RA
Formal analysis: S, RA
Writing-review and editing: S, RA

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Functional Outcome of Intramedullary Kirschner Wire Fixation of Unstable Radius-Ulna Fractures in Children

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ABSTRACT

Pediatric patients with unstable radius-ulna fracture can be treated with intramedullary Kirschner wire fixation. **Objective:** To determine the functional outcome of Intramedullary Kirschner Wire fixation in unstable radius-ulna fractures in children. **Methods:** All pediatric age patients were enrolled into the study with unstable radius and ulna fracture. Informed consent was taken before study. Proper history, examination and X-rays of the forearm was taken after taking consent from the guardian of the patient. Under general anesthesia and tourniquet, control radius was first fixed through a small volar incision by drilling a k wire at fracture site in radius so that the wire exits on the dorsolateral side of the radius. The fracture was than reduced and the wire tapped with hammer to the radial head. Similarly, ulna was fixed by first drilling the wire up to the olecranon process and after reduction of the fracture down to the styloid process. After checking stability both bones, both wounds were washed with normal saline and closed in reverse order and above elbow cast was applied for three to four weeks. **Results:** In this study, as per functional outcomes, 5(4.0%) patients had good outcome, 80(64%) patients had excellent outcomes whereas 40(32%) patients had poor outcomes. **Conclusions:** This study demonstrates excellent functional outcome of Intramedullary Kirschner Wire fixation in unstable both bone forearm fractures in children.

INTRODUCTION

Bone fracture of both long bones and short is a prevailing problem in all age groups and is most common in pediatric age group as compared to adult age group. Fracture of bone in children is a common problem in developing countries and has great burden on the budget allocated for health [1]. A large portion of falls occur during sports, in home, school, parks and restaurants [2]. Fractures are common in childhood, approximately one-third of boys and girls sustaining at least one fracture before 17 years of age [3]. Overall both bone forearm fractures are more common in the non-dominant hand, in boys, and in both distal forearm bones[4, 5]. The treatment of unstable radius and ulna fracture has changed recently with more deviation to surgical fixation due to early return to work, better alignment of bones and fewer complications [6]. The recommendations are based on an ongoing assessment of management modalities problems due to procedure, complications due to overall management plan and final results[7]. In the past 95.9% of fractures that were treated conservatively presented with bad functional results because most of these fractures healed with malalignment and nonunion. The differentiated use of conservative and

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surgical options should minimize final functional sequelae [8]. Treating children with unstable radius and ulna fracture, conservative treatment should be the first line of treatment however treatment modality can be changed according to deviation of fracture bone segments, especially there should be no hesitation in considering surgical treatment when the patients have a malalignment of more than 15 degree [9]. Over 90% of these fractures have been treated with closed reduction and plaster of Paris casting, and this has been historically the primary mean of treating patients with both stable and unstable one fracture. Often pose a therapeutic challenge, with little data available to compare outcomes [10]. Forearm fractures in pediatric age are treated differently from adult fractures because growth plates are not closed in both bones (radius and ulna) after the fracture has healed. Rotational deformity does not remodel while linear fractures remodel, unstable metaphyseal fractures should be percutaneously pinned under strict fluoroscopic guidance. Unstable diaphyseal fractures can be treated by intramedullary fixation [11]. The pediatric musculoskeletal system differs greatly from that of an adult and because of that they present with unique injury patterns and pose diagnostic and therapeutic challenges [12]. In children, intramedullary fixation by using standard K-wires plus cast immobilization provides effective treatment for unstable diaphyseal forearm fracture when closed management has failed [13, 14]. And surgical results are 85% excellent and 10% good [15]. While Vishwanath and Satheesh reported excellent results in 18(78%) patients, poor results in 5(22%) patients [16].The importance of the study is that it will contribute to the literature regarding the management of unstable radius and ulna fractures in pediatric patients. It will provide guidelines for pediatric orthopedic surgeons in managing fracture of forearm bones. Kirschner wire are easily available and cost effective and more compatible to body tissues as compare to Nancy wire and titanium wire which is more expensive and not easily available in our part of the world.

METHODS

This was a Descriptive Study conducted in the department of orthopedic surgery at Khalifa Gul Nawaz Teaching Hospital Bannu after taking ethical approval certificate from institutional review board. All pediatric patients presented to OPD or ER section of orthopedic surgery of unstable radius and ulna fractures diagnosed with digital x rays, were enrolled to the study after taking informed consent. All patients in the study were properly evaluated with pertinent history, relevant examination and x-rays of the forearm performed. Patients were sampled through consecutive non probability method by applying inclusion and exclusion criteria. Inclusion criteria included patients of both genders, age of 3-15 years and had unstable radius ulna fracture of more than 2 weeks. Exclusion criteria included all patients with open fracture of radius ulna and those who with poly trauma. All procedures were performed by single experienced orthopedic surgeon with special interest in this field of orthopedics pediatric section under general anesthesia in properly sterilized condition. Before induction of anesthesia all patients were given iv antibiotics according to weight and under tourniquet control through small volar incision radius fixed. A Kirschner wire of appropriate thickness was first drilled down with flexed and ulnarly deviated wrist so that the wire exits on the dorsolateral side of the radius distally. The fracture was than reduced and the wire driven up to the radial head. Similarly ulna was fixed by first driving the wire up to the olecranon process and after reduction of the fracture down to the styloid process. After checking stability both wounds were thoroughly washed and closed and skin approximated with prolene suture, and the forearm put in above elbow cast for three to four weeks. All sufferers had been observed month-to-month for medical and radiological union of fracture and for complication of surgery. The Kirschner wires have been eliminated after restoration of fractures. All sufferers had been strictly observed for six months at predesigned time table and appropriate report was maintained for all sufferers in the study. SPSS Version 19.0 was used for analyzing the data. Frequencies and percentages was recorded for categorical variables like gender, fracture side and time passed since fracture. Mean ± SD was calculated for continuous variables like age and duration of fracture fixation. Functional outcome was stratified among age, side of fracture and duration of fracture fixation to know the effect modifiers the usage of chi square test. p-value less than or equal to 0.05 was regarded as significant. The results are presented in form of tables and graphs.

RESULTS

This study was conducted on 125 pediatric patients at the Department of Orthopedics Surgery Khalifa Gul Nawaz teaching hospital Bannu. Mean ± SD for age was 11.5±3.23 (yr). Mean ± SDs for duration of disease was 4.4±1.12 (wk). 45(36%) patients were recorded in 4-7 years age group, 80(64%) patients were recorded in 8-15 years age group. 83(64.4%) patients were male, 42(33.6%) patients were female(Table 1).

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Table 1: Demographics of patients in the sample (n=125)

Demographics	Variables	Frequency (%)
Age	4-7 Years	45 (36)
	8-15 Years	80 (64)
Gender	Male	83 (66.4)
	Female	42 (33.6)

As per functional outcomes, 5(4.0%) patients had good outcome, 80(64%) patients had excellent outcomes whereas 40(32%) patients had poor outcomes (Table 2).

Table 2: Functional Outcome (n=125)

Functional Outcome	Frequency (%)
Good	05 (4.0)
Excellent	80 (64)
Poor	40 (32)

Functional outcome was measured in term of loss of angle of forearm rotation, which was measured with goniometer at six months follow up. Functional outcome was stratified into excellent, good and poor with forearm rotation angle of less than 15º, 15º-39º and angle greater than 90º respectively as shown in Table 3 and 4.

Table 3: Stratification of functional outcome with respect to age (n=125)

Functional Outcome		Age Groups		P value
		4-7 Years	8-15 Years	
Good	Yes	03 (6.6%)	06 (7.5%)	0.76
	No	17 (37.7%)	27 (33.75%)	
Excellent	Yes	7 (15.5%)	15 (18.75%)	0.072
	No	4 (8.8%)	9 (11.25%)	
Poor	Yes	8 (17.7%)	13 (16.25%)	0.082
	No	6 (13.3%)	10 (12.5%)	

Table 4: Stratification of functional outcome with respect to age (n=125)

Functional Outcome		Duration of Fracture		P value
		< 4 Weeks	> 4 Weeks	
Good	Yes	04 (6.6%)	06 (9.23%)	0.75
	No	19 (31.6%)	19 (29.2%)	
Excellent	Yes	10 (16.6%)	11 (16.9%)	0.056
	No	7 (11.6%)	9 (13.8%)	
Poor	Yes	12 (20%)	12 (18.46%)	0.059
	No	8 (13.3%)	8 (12.3 %)	

DISCUSSION

Fracture is a break in continuity of the bone which can be in cortex or inner layer of bone and in pediatric age group it occur commonly in upper limb, mostly in wrist and forearm as a consequence of fall in sports, restaurants , home and school while in adults, fracture occur as a result of road traffic accident, fall or sports. Fracture of upper limb bones in pediatric population add significant morbidity and mortality in developing countries like Pakistan, Bangladesh and India [1]. Fractures are a common in childhood and adults with about 30% of pediatric population sustaining at least one fracture before 17 years of age. Looking into the incidence of fracture in forearm it is greater frequent in the non-dominant hand in male populace [2]. The management of bone fracture in both adults and pediatric age group has changed exclusively in the near past due to changes in overall health care system, from in patient facility to day care surgery, from open surgery to endoscopic surgery and from conservative treatment to fixation in orthopedic. The guidelines are based on type of fracture, age group, level of activity and final results of the procedure which were performed for management of fractured bone. In the previous 95.9% of fractures that have been dealt with conservatively had been tainted with horrific consequences due to the fact that most of these fractures were healed with malalignment and nonunion. The proper indicated use of management lines in the form of conservative management and surgical measures either open or endoscopic should minimize patients' symptoms, signs, comorbidities, functional outcome and finally radiological findings [3]. The 1st line of treatment in patient with fracture of forearm bones is conservative, but if there is more than 15 degree malalignment then surgical procedures should be kept on priority as this has far good result as compared to conservative management [4]. Closed discount and casting has been the 1st line of administration in sufferers with unstable foremost ability of remedy in most of the fractures[5]. Unstable diaphyseal fractures of radius and ulna can be stabilized by means of intramedullary fixation of the radius and ulna [6]. In growing age especially under 12 year age musculoskeletal system vary greatly from those whose skeletal system are mature and metaphysis and diaphysis are fused. Although these differences fade away with age, when they come across injury they present with unique fracture and pose difficulty in the diagnosis and overall management plan [7]. In this study, as per functional outcomes, 5(4.0%) patients had good outcome, 80(64%) patients had excellent outcomes whereas 40(32%) patients had poor outcomes. In children and adolescents, intramedullary fixation with standard Kirschner wires and cast immobilization offers effective treatment for unstable radial shaft fractures when medical treatment has failed or not been initiated [8]. It shows 85% excellent and 10% good results [9]. While Vopat *et al.*, reported excellent results in 18(78%) patients, poor results in 5(22%) patients [10] which as compared to this study, 9(6.04%) patients had good outcome, 92(61.71%) patients had excellent outcomes whereas 48(32.21%) patients had poor outcomes (Table 2). Our results are comparable with that of Van der Reis *et al.*, who had 24(80%) patients with excellent results, 5(16.6%) with good results and 1(3.3%) with fair results [17]. Chapman *et al.*, reported in their study, though their sample size was small

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but they have concluded excellent results in 21(84%), good results in 4(16%) and no patients have poor results[18]. In a retrospective study performed by Cullen *et al.*, in which 23 patients were treated with plate fixation and 18 patients with intramedullary nailing, they have concluded excellent results in 18(78%) patients and poor results in 5(22%) patients at follow up of 12 months post-surgery. The functional outcome, rate of union and other complications were statistically similar in both groups[19]. Schemitsch *et al.*, in their study at university hospital between 2000 to 2007 total 22 pediatric patients with forearm fractures were treated by ESIN, their study shows favorable results after ESIN at 12.4 years of surgery [20]. Hence after comparing results of various studies it has been declared that intramedullary nailing for radius and ulna fracture has good results in term of patient's symptoms, functional outcome and radiological findings.

CONCLUSION

This study demonstrates excellent functional outcome of Intramedullary Kirschner Wire fixation in unstable radius-ulna fractures in youngsters.

Authors Contribution

Conceptualization: IK
Methodology: MR, IK
Formal analysis: MK, AK
Writing-review and editing: AH, AK

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Frequency of Diseases Requiring Hysterectomy: A Cross Sectional Study at Tertiary Care Hospitals in Peshawar

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ABSTRACT

Hysterectomy, after cesarean section is the most common performed major surgical procedures all over the world. In the united states, 5.5/1000 women underwent hysterectomy in the years 2001 to 2005. **Objective:** To estimate the frequencies of different diseases that needs hysterectomy at Peshawar Medical College and its affiliate hospitals. **Methods:** This cross-sectional study was carried out from 3rd Oct, 2020 to 3rd Oct, 2021 at the Department of Obstetrics and Gynecology, Peshawar Medical College and its affiliate hospitals. Consecutive sampling was done and a sample size of 104 patients was obtained. Those patients who recently underwent abdominal or vaginal hysterectomies aged 25-60 years with history of any parity were included. Patients with co-morbid conditions such ischemic heart disease, chronic kidney disease, malignancies and other obstetric complications such as emergency cesarean hysterectomies were excluded. **Results:** Mean age with standard deviation was 48.55 ± 8.53. Mean and standard deviation for weight was 73.20 ± 6.103. Of total patients, 44 (42.3%) patients had symptomatic fibroid uterus, 29 (27.9%) patients had uterovaginal prolapse while 31 (29.8%) patients had abnormal uterine bleeding as indication for hysterectomy. Among these patients, 66 (63.5%) were subjected to abdominal hysterectomy while 38 (36.5%) went through vaginal hysterectomy. **Conclusions:** The most common disease that needs hysterectomy in our study was symptomatic leiomyomas of uterus followed by abnormal uterine bleeding due to other causes and uterovaginal prolapse.

INTRODUCTION

Hysterectomy is one of the most common major surgical procedure performed worldwide. In US, approximately 600,000 hysterectomies are performed each year [1]. The data is limited to departmental audits from different institutes and no national registry about hysterectomies exist in pakistan. A study comprising 148 patients who underwent abdominal hysterectomies reported that the most common disease requiring hysterectomy was heavy and irregular bleeding (54.73%) followed by pelvic masses (29.05%) which were mostly fibroids. The same study reported that mostly woman undergoing surgery were parity 6 and in the age group 41 to 50. Anemia, hypertension and diabetes were the most common pre-operative risks while hemorrhage and infection were the most common postoperative complications [2]. Other studies have reported leiomyomas as the most frequent cause for performing hysterectomies followed by a dysfunctional uterine bleeding and genital or uterine prolapse. During the study period (2011-2012), most hysterectomies were performed abdominally (54.4%). Abdominal hysterectomy has a significantly higher complication rate as compared to vaginal and laparoscopic hysterectomy (p value= 0.001)[3].

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Leiomyomas of the uterus account for 1/3rd of the diseases requiring hysterectomies and is a leading cause of gynecological visits in USA requiring an annual budget of $1.2 billion [4, 5]. About 1/5th of hysterectomies are performed for endometriosis.6 Genital and uterine prolapse in multiple gravida patients due to week pelvic floor muscles and ligaments contribute considerably to the indications for hysterectomy (15%) [7]. Various diseases have been described in the literature that requires hysterectomy including uterine cancer, ovarian cancer, some cases of cervical cancer, and various benign uterine conditions like fibroids, endometriosis, uterine prolapse and adenomyosis [8]. In our country, there are controversies that hysterectomies are being performed for without an absolute indication and holds true especially in our province, Khyber Pakhtunkhwa. Certain alternative approaches exist to treat benign diseases and hysterectomy can be avoided as it carries surgical risks as well as long-term effects, and also render the patient unable to bear children. This is an effort to know the exact indications for such hysterectomies and results of this study shared with local obstetricians, it helped minimize the frequency of hysterectomies for especially for non-malignant indications in our local population of Khyber Pakhtunkhwa due to availability of good alternatives in many cases.

METHODS

This cross-sectional study was carried out from 3rd Oct, 2020 to 3rd Oct, 2021 at the Department of Obstetrics and Gynecology, Peshawar Medical College and its Affiliate Hospitals. Consecutive sampling was done and a sample size of 104 patients was obtained considering 16.3% utero-vaginal prolapse as an indication for hysterectomy with confidence interval 95%, margin of error 7.1% and using WHO sample size calculator. Those patients who recently underwent abdominal or vaginal hysterectomies aged 25-60 years with history of any parity were included. Patients with co-morbid conditions such ischemic heart disease, chronic kidney disease, and other obstetric complications such as emergency cesarean hysterectomies confirmed on clinical history of the patient were excluded. Prior to the conduct of the study, written informed consent form was obtained from all patients. SPSS version 23.0 was used as statistical tool.

RESULTS

Mean and SDs of age was 48.55 years ± 8.53. Mean and SDs of height was 5.508 feet ± 0.0832. Mean and SDs of weight was 73.20 ± 6.103. Mean and SDs of BMI was 26.58 ± 2.17 (Table 1).

Table 1: Mean and Standard deviations of Age, Weight, Height and BMI

Variables	Mean ± SD
Age (years)	48.55 ± 8.53
Height (feet)	5.50 ± 0.08
Weight (kg)	73.20 ± 6.10
BMI	26.58 ± 2.17

Thirty-eight (36.5%) patients were in 25-45 years age group while 66 (63.5%) patients were in 46-60 years age group. Sixty-six (63.5%) patients were subjected to abdominal hysterectomy while 38 (36.5%) went through vaginal hysterectomy. Urban and rural population was 71.2% and 28.8% respectively. Sixty-eight (65.4%) patients had diabetes mellitus, 53 (51.0%) patients were from poor families, and 18 (17.3%) patients were from middle class families while 33 (31.7%) patients were from rich families. As per frequencies and percentages for indications of hysterectomies, 44 (42.3%) patients had symptomatic fibroid uterus, 29 (27.9%) patients had utero-vaginal prolapse while 31 (29.8%) patients had abnormal uterine bleeding. The frequency of diseases in different age groups is shown in Table 2.

Table 2: Stratification of Indications of Hysterectomies with respect to Age Groups (n=104)

Indications of Hysterectomies	Age Groups		Total
	25-45 Years	46-60 Years	
Symptomatic Fibroid Uterus	15(39.5)	29(43.9)	44(42.3)
Uterovaginal Prolapse	11(28.9)	18(27.3)	29(27.9)
Abnormal Uterine Bleeding	12(31.6)	19(28.8)	31(29.8)
Total	38(36.5)	66(63.4)	104(100)

DISCUSSION

Mean and SDs of weight and BMI were consistent to the findings of Anbreen *et al.*, [9]. In our study, patient was classified into two groups presumably premenopausal i.e. <45 years and post-menopausal i.e. with 38 patients falling in the age group 25 to 45 years and 66 patients aged 46 to 60 years, which was consistent with the findings of Baral *et al.*, [10]. In this study, 66 (63.5%) patients were subjected to abdominal hysterectomy while 38 (36.5%) went through vaginal hysterectomy. Moreover, 42.3% patients had symptomatic fibroid uterus, 27.9% patients had utero-vaginal prolapse while 29.8% patients had abnormal uterine bleeding which was consistent with the findings by Mahnert *et al.*, and Lonky *et al.*, who reviewed 10,274 women undergoing hysterectomy for benign disease. They reported that one out of eleven women undergoing hysterectomy for benign disease present to the emergency department for pain (29.5%), GI symptoms (12.8%), and genitourinary problems (10.7%). They concluded that educating the patients pre-operatively and improved communication with the high-risk patients can

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significantly reduce these visits [8, 11]. In another study by Johns most common indication for hysterectomy was symptomatic leiomyomas of the uterus followed by genital and uterine prolapse, 39.9% and 16.3% respectively [12]. A study conducted in Finland showed a decreasing incidence rate of hysterectomies with a changing trend of indication after 2010, where uterine fibroids was replaced by genital prolapse and incontinence as the most common cause for hysterectomy. Our study reflects a pattern not necessarily a change of trend as reported by Hakkarainen *et al.*, Cervical and uterine malignancies are treated with hysterectomy [13]. In a cohort of 1247 patient, Tchartchian *et al.*, reported that 0.4% of the patients had uterine cancer and 0.16% had fallopian tube cancer [14]. Similarly, Elliott *et al.*, reported the unexpected malignancy in a uterine specimen after hysterectomy to be 1.8% [15]. Interestingly, none of our patient had hysterectomy performed for malignant disease. These findings are consistent with Manandhar *et al.*, who reviewd 1912 patients undergoing hysterectomy and reported that leiomyomas (35.10%) was the most common clinical indication for hysterectomy, followed by uterovaginal prolapse in 22.46% patients, adnexal mass in 18.56% of the patients, and abnormal uterine bleeding in 10.34% of the patients [16]. This finding may be due to the availability of more specialized centers for cancers in the locality and the patient preferences to get treated there. Various routes of hysterectomy are employed including total abdominal, total laparoscopic, trans-vaginal, lap assisted trans-vaginal and robotic natural orifice vaginal hysterectomy. Our practice significantly differs from the standard of care adopted by most center where minimal invasive routes are preferred for benign diseases requiring hysterectomy. Madhvani *et al.*, shared the changing practice in NHS hospitals from 2011 through 2017 and reported that the proportion of total laparoscopic hysterectomy (TLH) increased from 20.2% to 47.2%. The total abdominal hysterectomies (TAH) decreased from 70.4% to 46.5% and the vaginal hysterectomy decreased from 7.8% to 3.5% [17]. A retrospective study from Australian tertiary hospitals reported that 51.7% hysterectomy were performed laparoscopically, 44% abdominally and 13% vaginally [18]. Infection, bleeding, injury to the colon or urinary tract, vesicovaginal fistula and bowl obstructions are some of the complications inherent to the hysterectomy. Settnes *et al.*, reported the Clavien–Dindo modified complications of hysterectomy and showed that 7.0% patients had major (grade 3-5) and 9.4% had minor (grade 1-2) complications [19]. In a large retrospective review from china, it was reported that the complications rate of laparoscopic hysterectomy was greater as compared to abdominal hysterectomy [20]. This signifies the importance of patient education regarding the variety of options to approach a disease that require hysterectomy, the different routes and the complications associated with each.

CONCLUSIONS

Symptomatic fibroid uterus is the major indication for hysterectomy in women aged 25 years and above followed by abnormal uterine bleeding and utero-vaginal prolapse. Indication in an individual patient should be carefully evaluated, and alternative treatments sought to prevent untoward events.

Authors Contribution

Conceptualization: HB
Methodology: A, QK, HS
Formal analysis: HS
Writing-review and editing: HB, AA

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Awareness About Nutrition Facts on Food Labels and Their Influence on Food Selection Among Consumers

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ABSTRACT

Nutrition facts on food labels contain complete information about nutrients (fats, proteins, cholesterol, salt, sugar and vitamins) and calorie content of packaged food items. **Objective:** To determine the awareness about nutrition facts on food labels and their influence on food selection among consumers. **Methods:** This is a cross-sectional study and was done by using self-designed questionnaire, among 206 individuals of age group between 18 to 65 years, which were selected from different grocery stores and nearby area, after getting their consent. **Results:** Study findings revealed that around 53% of selected respondents sometimes read nutrition facts on food labels, only 13.1% consumers always read nutrition facts, 14.5% of them never read food labels and only 39% changed their purchasing decision after reading food labels. Results also showed that 48.1% of consumers found nutrition facts helpful and reliable and 60% respondents felt confident an made better choices after reading food labels. **Conclusions:** The percentage of consumers using food labels is low which means that unhealthy eating is prevailing, so this study can be used as a reference to develop policies regarding awareness about use of nutrition facts on food labels, promoting healthy eating habits in the country.

INTRODUCTION

Nutrition facts on food labels contain complete information about nutrients (fats, proteins, cholesterol, salt, sugar and vitamins) and calorie content of packaged food items. In present time, awareness about the use of food labels is important because various health related conditions are prevailing due to consumption of unhealthy food product [1]. While buying any food product consumers must keep in mind to read nutrition facts on food labels, which helps them to identify whether that product is healthy or not. Most consumers are choosing unhealthy products because they are unaware of food labels or they cannot read information on labels, as it is difficult to understand [2]. A study was conducted in Maryland, to evaluate that the consumers are interested in what type of information on food labels, and conclusion was made that calorie information was mostly viewed information on nutrition facts panel [3]. This information helps in prevention of various diseases related to food intake like obesity, hypertension, diabetes and many more. In many countries like US, it is mandatory to provide nutrition facts panel on all packaged food items so that, consumers can adopt healthy eating patterns according to their

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requirements. Consumers' use of food label information largely depends on the way it is presented so, it should be easy and concise to be read [4]. A study was conducted among selected Filipino adults to determine the prevalence of use nutrition facts labels information, and it was found that 87.73% adults read nutrition facts labels before buying any food product. Different factors affect use of nutrition labels like intentions, time for shopping, age, gender, searching for desired information, socioeconomic status, educational status, occupation, monthly income, nutrition knowledge and understanding of nutrition facts labeling [5]. Mostly women use nutrition facts label more than men because they have responsibility for the healthy lifestyle of family as they do groceries more often, so it is necessary for them to have much knowledge about nutrition information on labels [6]. Food labels on different packages attract consumers in various grocery stores and market areas, which help them to distinguish healthy and unhealthy food in different perspective. In some countries there is demand of food label information which indicate the awareness about nutritional knowledge of people [7]. This increased awareness has helped consumers about food safety, various eating disorders and healthy eating habits. Many studies have been conducted to evaluate the use of nutrition facts on food labels and how consumers perceive and understand that information, as some consumers read the information but cannot understand that information due to lack of knowledge and awareness about that information [8]. When a consumers read nutrition fact label and find information according to his desire, like if he or she is searching for low fat food item and on the label, this is mentioned clearly in the list than he or she will definitely buy that product, otherwise he will not buy that product [9]. Consumers from both urban and rural areas have almost same opinions regarding nutrition facts while buying food products because they provide healthy and useful information according to them [10]. If they are aware about healthy food and their effects on health and also their requirements for that, only than they will be able to choose healthy product. Consumers' purchasing decisions depends majorly on their knowledge and perceptions about that information [11]. Another factor which affects purchasing of food products is income level. Consumers' having high income are more concerned about what they are eating and more involved in purchasing processed pre-packaged products so, nutrition facts here play important role in choosing healthy product [12]. So, a clear understanding about nutrition facts on food labels will help her in choosing healthy food items among all other unhealthy and expensive products. Deciding food label reading indicators and barriers is an important measure in promoting healthy eating [13]. Individuals having less knowledge to calculate their daily requirements or not being able to interpret information provided on labels can result in choosing unhealthy products which can affect their health as well as their family's health if they are choosing for them also [14]. When individuals are concerned about their health only then they will make steps towards choosing healthy foods, and that is possible only by reading nutrition facts on products to see which ones are healthier and more required by them. So, different measures should be taken to increase the awareness about nutrition facts on food labels use to decrease the risks of diet related disorders among all generations [15].

METHODS

This study was conducted from June 2021 to October 2021. For study, data were collected from different consumers of grocery stores and nearby area of locality. The design of this study was cross-sectional in nature. Consumers from supermarkets of age group 18-65 years were selected for the study. The following category was excluded from this study: Consumers younger than 18 years and older than 65 years were not part of the study. Sample size constituted randomly selected individuals from grocery stores. Considering 95% confidence interval with 5% margin of error and 87% prevalence, the sample size came out to be 206 individuals (both males and females). The data were collected by using self-designed questionnaire technique. All participants, willing to participate in study were requested to answer the designed questionnaire. All collected data were analyzed by SPSS (Statistical Program for the Social Sciences) version 25.0.

RESULTS

Table 1 shows frequency and percentages of demographic information of respondents in the study, which includes age, gender, marital status, occupation and education status of participants.

Table 1: Demographics of respondents

Variables	Frequency (%)
Age	
18-25	96(46.6)
26-45	58(28.2)
46-65	52(25.2)
Gender	
Male	89(43.2)
Female	117(56.8)
Marital status	
Married	108(52.4)
Not married	98(47.6)
Occupation	
Business	31(15)
Employee	57(27.7)
Student	59(28.6)
House wife	59(28.6)
Education	
Matric	4(1.9)

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Intermediate	26(12.6)
Bachelors	145(70.4)
Masters	31(15)

Table 2 shows that out of 206 respondents only 27 of them always read nutrition facts on food labels, 42.2% of them found that information sometimes difficult, 46.1% found information on food labels helpful and reliable and 110 of them were willing to buy any product which is expensive but have suitable nutrition facts.

Table 2: Frequency and percentages of all variables

Variables	Frequency (%)
Do you read nutrition facts on food labels while buying any food item?	
Quite often	39(18.9)
Always	27(13.1)
Sometimes	110(53.4)
Never	30(14.5)
The information about nutrition facts is easy to understand or difficult for you?	
Easy	66(32)
Quite easy sometimes	40(19.4)
Sometimes difficult	87(42.2)
Always difficult	13(6.3)
In last one month, is there any instance where you changed your decision to buy any food product after reading nutrition facts on food label?	
Yes	82(39.8)
No	78(37.9)
I don't remember	46(22.3)
Do you feel confident and make better choices after reading nutrition facts on food labels?	
Yes	125(60.7)
No	24(11.7)
Sometimes	57(27.7)
Do you find nutrition facts on food labels helpful and reliable?	
Yes	99(48.1)
Sometimes	95(46.1)
Not at all	12(5.8)
If the product which you are buying is expensive but have suitable nutrition facts, will you buy that product?	
Yes	110(53.4)
No	53(25.7)
May be	43(20.9)
Do you think that nutrition information is the major factor that determine the consumers choice of food product?	
Strongly agree	30(14.6)
Agree	109(52.9)
Neutral	56(27.2)
Disagree	11(5.3)
Strongly disagree	0(0)

DISCUSSION

Nutrition facts on food labels are important tool in choosing healthy products which lead towards a healthy lifestyle in present time, when risk of food related diseases is prevailing. It is seen in this research that consumers change their purchasing behaviors after reading nutrition facts on food labels. Use of nutrition facts panel on food labels was assessed in this research and it can be seen in table 1.2 that, around 53% of selected consumers read nutrition facts sometimes before buying any product and only 13% of them always read food labels. This shows that percentage of people reading nutrition facts on labels in low as compared to other countries' researches. In one study conducted in New Zealand, it was shown that out of total 460 respondents only 100 of them routinely used nutrition facts on food labels. This shows that use of food labels should be increased worldwide, as it is a major step towards healthy disease-free lifestyle [16]. From our study results as shown in table 1.2, it is seen that more females are concerned about reading nutrition facts on labels than males, like information regarding fat or sugar in any food product besides other information. These results are also seen in research, conducted in Poland in which they also found out that more females (56%) are influenced by nutrition information on labels [17]. Also, in our study it is shown that, 48.1% of respondents thought that nutrition facts on food labels were helpful and reliable in choosing food products, these same results were provided by researchers of Sri Lanka, who concluded that around 41.8% of their respondents thought that nutrition facts were most of the time helpful and readable [18]. Understanding of nutrition facts information is really important factor in choosing healthy product, if any consumes wants to buy a healthy food item but he or she is not able to understand nutrition information correctly due to any reason, then the purpose of nutrition facts will not be fulfilled. In our findings as shown in table 1.2, it can be seen that only 32% of selected respondents thought that nutrition information on food labels was easy to understand and around 75% of them found information sometimes difficult. Research was conducted in South Africa, on consumer's opinion and use of food labels in which they found out that 65% of their respondents found information on food labels easy to understand and only 16% disagreed to that. This shows that in our country food industries should take this problem into account for healthier food choosing habits [10]. If someone is interested in making healthy lifestyle than he or she has to make healthy food choices, this can be made possible by using nutrition facts panel while buying food items. In our study we have seen that around 60% of respondents were confident and made healthier choices after reading food labels. A study was conducted in US, in which they found out that around 80% of their selected respondents chose healthy products after reading nutrition information on food labels. This shows that nutrition facts are very helpful in choosing healthy products as evidenced by researches. If they are used more often than risk of various food related disorders can be minimized [19]. One thing, very important to consider, is that purchasing power of consumers should be influenced by reading nutrition facts on food labels. According to our study, only 82(39%) out of 206 selected respondents changed their purchasing decision after

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reading nutrition information on labels. This is not a convincing result as importance of nutrition facts is much more important than that. Research was conducted in India by Kumar and Kapoor, in which researchers assessed the influence of food labels on purchase decision, and they found out that only 162(43%) out 371 often changed purchasing decision after reading nutrition information and only 11% always changed their decision after reading nutrition facts on food labels[20].

CONCLUSIONS

According to the survey conducted, it was concluded that the awareness of nutrition facts on food labels was lacking among most of the consumers. Most of the participants think that nutrition information on food labels is important factor in determining choice of a healthy product. This emphasizes the need to develop different programs to improve the usage of nutrition facts on food labels among consumers to improve healthy choices of packaged food products as their use is increasing day by day in our country. Majority of consumers agreed that nutrition facts is an important factor in choosing healthy food products.

Authors Contribution

Conceptualization: FHR, KJ
Methodology: AFR, MK
Formal Analysis: AFR, ZH
Writing-review and editing: FHR, MM

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest

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Original Article

Trends of Hepatorenal Variations in Hepatitis-C Patients Visiting THQ Level Hospital in Arifwala Punjab

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ABSTRACT

Hepatitis C virus (HCV) is a source of kidney illness and liver pathogenesis such as cirrhosis and hepatocellular carcinoma (HCC). **Objective:** To evaluate variations in hepatic and renal profile of hepatitis-C patients. **Methods:** For this purpose, blood samples of 94 participants were collected. Out of which 64 were hepatitis-C patients and 30 were healthy controls. All the participants were enlisted from Tehsil Headquarter (THQ) Hospital, Arifwala. Both males and females were included in the HCV Patients group. The serum concentrations of alanine aminotransferase (ALT), aspartate aminotransferase (AST) urea, creatinine, albumin, bilirubin, glucose and gamma-glutamyl transferase (GGT) were estimated by chemistry analyzer. Unpaired Student "t" test was applied to analyze the data of biochemical variations in hepatitis-C patients as compared to normal persons with significance level of $p \leq 0.05$. For statistical interpretation, Graph pad prism version 6.0 software was utilized. **Results:** Significant elevation in the levels of glucose ($p = 0.0002$), ALP ($p = 0.01$), ALT ($p = 0.0009$), AST ($p = 0.002$) and GGT ($p < 0.0001$), whereas, non-significant increase in the levels of creatinine ($p = 0.9$) and bilirubin ($p = 0.51$) was evidenced in hepatitis-C patients as compared to healthy controls. While, significant decrease in the level of albumin ($p = 0.0008$) was observed in hepatitis-C patients as compared to healthy controls. **Conclusions:** The fluctuations in these parameters suggest that HCV has a significant impact on hepatic health markers.

INTRODUCTION

Hepatitis C virus (HCV) is a pronounced reason of chronic liver infection, causing almost 400,000 deaths annually worldwide [1]. HCV, a single stranded RNA based virus with its eight established genotypes that are subdivided into 86 confirmed subtypes differing by only 15%–25% [2, 3]. Different estimations have documented that 130-170 million individuals are infected annually with the hepatitis C infection. Hence, HCV is considered as significant general medical problem [4]. The highest incidence of HCV infection is reported in Egypt, where it goes up to 15% [5]. There are six comprehensive genetic variants of HCV that differ in their disease-causing ability, output of interpretation/duplication and receptiveness to anti-viral treatment. Genotype 1, 2 and 3 are the significantly observed in Western Europe, North America and Japan. Whereas, genotype 4 has been found in the Middle East, Northern and in Central Africa. While, genotype 5 has been documented in South Africa and Genotype 6 in Southeast Asia, respectively [6]. Mostly the spread of HCV infection is through percutaneous contacts of blood transmission, replacement of diseased organs and infusing medications. Perinatal transmission happens at lower rate and the chance of sexual transmission is disputable [7]. In 20–30% of diseased people, HCV causes intense infection, but in most patients, it causes a long-term chronic illness. Persistent infection with HCV is associated with the

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development of chronic hepatitis, hepatic steatosis, cirrhosis and hepatocellular carcinoma (HCC) [8]. Chronic hepatitis C (CHC) is the chief sources of hepatic demise and most well-known sign for liver transplantation in the United State of America [4]. It should be noticed that more than 350,000 diseased persons die due to HCV-related liver illnesses [9]. From 10% to 20% of HCV-tainted patients develop cirrhosis over a time of 15 to 30 years. When cirrhosis develops, exhaustion, muscle shortcoming and squandering, liquid maintenance with edema and ascites, simple wounding, dull pee, jaundice, tingling and upper gastrointestinal discharge can happen [10]. The fundamental site of HCV multiplication is in hepatocytes, which clarifies the huge liver harm that it manifests. Most of the injury in the liver is brought about by a cell-intervened response against contaminated liver cells [9]. In HCV conditions cryoglobulins are regularly produced causing organ damage through either a hyper viscosity condition or immune mediated mechanism [11]. Though, cryoglobulinemia are produced in numerous diseased conditions, however, these are significantly associated with HCV patients [12, 13]. Clinical indications of liver illness will in general at first be vague, and irregular, with exhaustion depicted as torpidity, discomfort, absence of energy, anorexia, sickness, arthralgia, myalgia and weight loss [14]. Many pathological conditions are attributed with the hepatitis conditions. A few clinical investigations have documented a relationship between chronic HCV disease, insulin resistance and diabetes mellitus (DM) [15]. The epidemiological data have depicted that type 2 diabetes mellitus (T2DM) developed in 14.5-33% of patients with CHC [16]. Type 2 diabetes mellitus was predominant in patients infected with HCV-related cirrhosis of the liver than in those with cirrhosis of the liver coming about because of other liver infections [17]. HCV infection is an autonomous indicator of stroke and cerebrovascular [18]. Patients with CHC have indicated a pronounced danger of cardiovascular disorders [19]. HCV infection is correlated with different thyroid illness like chronic thyroiditis, hypothyroidism, and hyperthyroidism [20]. Idiopathic pulmonary fibrosis (IPF) is a condition related with HCV contamination. It is clinically portrayed by dyspnea and interstitial irritation with thick collagen fibrosis [21]. Renal association is one of the most widely recognized extreme indications of mitochondrial cytopathy (MC). Studies have demonstrated that patients with HCV contamination are 40% bound to develop end stage renal infection than the general population [22]. Kidney is an important target of HCV disorder, other than liver, musculoskeletal, hematopoietic system and skin [23]. HCV may induce kidney infection in different ways (a) glomerular complications (b) direct intrusion to the renal parenchyma; (c) nephrotoxicity of medications utilized for its treatment [24]. Persistent HCV exposure can bring about a huge danger for renal health acute kidney injury (AKI) in patients with lack of hydration, sepsis, or progressed liver injury [25]. This is a well-established fact documented in <5% -15% of HCV positive subjects [26]. The purpose of present study was to assess the fluctuations in glycemic, renal and hepatic profile of hepatitis-C patients as compared to healthy controls. Hence, the result would help out to do better in therapeutic management of hepatitis-C patients in these regions.

METHODS

This study plan was endorsed by the Institutional ethical review committee of Institute of Zoology, University of the Punjab, Lahore in 2021. Phlebotomy of total 94 subjects was carried out for this study. Among these, diseased group comprised of 64 hepatitis-C patients and 30 healthy controls. Both males and females were included in the HCV Patients group. Thirty-nine females and twenty-five males were recruited for hepatitis-C group. Whereas, control group contain twelve females and eighteen males. Random sampling technique was done for this case control investigation. Subjects having confirmed biochemical investigation of HCV were included in the diseased group. However, patients having condition like hepatocellular carcinoma or any type of cancer were excluded from this investigation. Blood samples of all the subjects were taken from Tehsil Headquarter Hospital (THQ) Hospital Arifwala, Punjab, Pakistan. All studied participants were informed about the significance of the study. Initially, a proforma was designed to note complete data of the clinical record of controls and patients. It included the fundamental attributes like age, sex, habit of smoking or addiction, family history of any ailment and BMI (kg/m^2). The motivation that clinical information gathered during this investigation would assist our medical professionals for future management of hepatitis patients was explained to each participant of the study. Moreover, written informed consent form was also signed by each of the participant before study. Subjects having hepatitis-C infection were included in the study as diseased group. Whereas, participants not having any hepatic ailment were considered as control group. A registered health technician was hired for the process of blood sampling. All the protective measures were taken as human subjects were engaged in the study. Before sampling, health condition of each person was confirmed. Three mL blood sample was drawn from each individual in separate tubes. Collected samples were then centrifuged at 3000 rpm for 15 minutes. Serum was separated from the clot in another acid washed test tube after 3-4 hours of blood compilation. The serum samples were then stored at -20 ºC in the

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labeled plastic vial. Within four hours of sampling, biochemical test of blood samples of control and hepatitis-C patients was done. Both control and HCV Patients' sample were analyzed using commercially available kits. Clinical chemistry analyzer (microlab 300) was used to measure the concentration of Alanine Aminotransferase (ALT) Aspartate Aminotransferase (AST) Urea, Creatinine, Albumin, Bilirubin, Glucose, Gamma-Glutamyl Transferase (GGT). Determination of all studied parameters was performed in Physiology/Endocrinology Laboratory, Institute of Zoology, University of the Punjab, Lahore. Graph Pad Prism (version 6.0) software was used for statistical analysis. Unpaired student "t" test was applied to assess mean and SEM of biochemical variations in hepatitis-C patients as compared to normal persons.

RESULTS

Table 1 showed the glucose, blood urea, creatinine, albumin, ALP, AST, ALT, GGT and bilirubin level in control and affected participants.

Table 1: An overall comparison of renal and hepatic profile in controls and hepatitis-C patients

Parameters	Mean ± SEM		p-value	Percentage difference
	Control (N=30)	Diseased (N=64)		
Glucose (mg/dL)	100.5 ± 2.64	164.3 ± 11.28	0.0002	63↑***
Blood Urea (mg/dL)	29.45 ± 1.83	44.73 ± 7.03	0.1	52↑
Creatinine (mg/dL)	0.86 ± 0.03	1.05 ± 0.13	0.3	22↑
Albumin (g/dL)	4.09 ± 0.104	3.51 ± 0.10	0.0008	14↓***
ALP (U/L)	91.00 ± 4.34	115.3 ± 6.66	0.01	27↑*
AST (U/L)	27.20 ± 2.56	37.36 ± 1.90	0.002	37↑**
ALT (U/L)	21.57 ± 1.59	30.17 ± 1.54	0.0009	40↑***
Bilirubin (mg/dL)	0.52 ± 0.05	0.59 ± 0.07	0.5	14↑
GGT (U/L)	24.13 ± 2.84	48.59 ± 3.46	< 0.0001	101↑***

***, **, * indicate level of significance at p< 0.001, 0.01, 0.05, respectively; Ns: Not Significance; ↑Increase; ↓Decrease; mg/dL: milligram per deciliter; g/dL: gram per deciliter; U/L: units per liter

Glucose: Our investigation showed a significant increase ($p < 0.0002$) of 63% in glucose level of hepatitis-C patients as compared to control subjects (Fig; 1A). Urea: No significant difference was observed in urea level of hepatitis-C patients in comparison to controls. However, the hepatitis-C patients demonstrated a mild increase of 52% in urea level as compared to controls (Fig; 1B). Creatinine: The creatinine value demonstrated non-significant increase of 22% in hepatitis-C patients as compared to controls (Fig; 1C). Albumin: The level of albumin was significantly ($p < 0.0008$) lowered by 14% in hepatitis-C patients in comparison to controls (Fig; 1D). Alkaline Phosphate (ALP): There was significant increase ($p < 0.01$) of 27% in the level of alkaline phosphate in hepatitis-C patients as compared to controls (Fig; 1E). Aspartate Transaminase (AST): Hepatitis-C patients showed significant ($p < 0.002$) rise of 37% as compared to controls (Fig; 1F). Alanine aminotransferase (ALT): The results indicated a significant increase ($p < 0.0009$) of 40% in hepatitis-C patients as compared to controls (Fig; 1G). Bilirubin Total: The Bilirubin value increased non-significantly ($p < 0.51$) by 14% in patients of hepatitis-C in comparison to controls (Fig; 1H). Gamma-Glutamyl Transferase (GGT): Hepatitis-C patients presented a significant increase ($p < 0.0001$) of 101% as compared to controls (Fig; 1I).

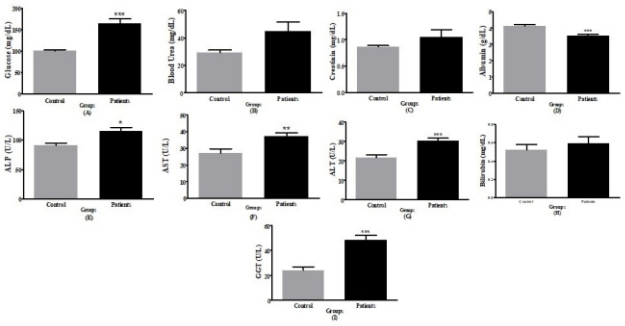

Figure 1: (A-I): An overall presentation of Glucose, Urea, Creatinine, Albumin, ALP, AST, ALT, Bilirubin and GGT in Control and HCV patient's groups

Values are Mean ± SEM. ***, **, * indicate levels of significance at p < 0.001, 0.01, 0.05, respectively

DISCUSSION

Extrahepatic ailments manifested by chronic HCV illness possess serious threats to the status of the diseased subjects [22]. Numerous epidemiological investigations have documented that active HCV is attributed to a greater incidence of chronic kidney disease (CKD) in these subjects. Moreover, it is recommended that patients with HCV should be screened for CKD even without symptom of any kidney dysfunction [27]. HCV is one of the pronounced reasons for hepatic disorder because of fibrosis, cirrhosis and hepatocellular carcinoma (HCC). Exosomes derived from infected hepatocytes manifest hepatic fibrosis. Initial screening of HCV can reverse the fibrosis. Whereas, lack of initial screening may lead to end stage liver injury. For this reason, in time identification establishment of HCV diagnosis is a key to reduce pathogenesis of the disease [28]. Our findings have shown a significant increase in glucose, alkaline phosphate, alanine aminotransferase, aspartate aminotransferase and gamma-glutamyl transferase, whereas, non-significant increase in the levels of creatinine and bilirubin was evidenced in hepatitis-C patients as compared to healthy controls. Significant decrease in the level of albumin was observed in hepatitis-C patients as compared to healthy controls. As far as albumin level is concerned, hepatitis-C patients depicted significant reduction in their levels as compared to healthy controls. These findings are in accordance with the investigation of Nagao and Sata [29]. Reduced serum concentration of albumin predicts poor hepatic activity.

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The well-established reason behind a reduced albumin is chronic hepatic injury manifested by cirrhosis. The deranged serum albumin concentration indicates the onset of liver cirrhosis and huge liver damage. In hepatic cirrhosis condition, serum albumin level might be below 3.5 g/dL. Moreover, reduced concentration of albumin van result in ascites and edema in hepatitis C patients [30]. Our investigation has depicted an increase in bilirubin in hepatitis C patients in comparison to controls. The findings of Ashraf-uz-Zaman *et al.*, [31] and Anand and Velez [32] documented similar trends of fluctuations in serum bilirubin levels of hepatitis C patients. In this study, the concentration of AST was raised in HCV subjects, however, it does not establish the diagnosis of hepatic ailment as documented by Hajarizadeh *et al.*, [33]. It is well known fact that AST is generally present in major tissues including heart, liver parenchyma, brain, kidney and muscles. Hence, it can easily seep in serum when any of these organs are damaged [34]. In this study the concentration of ALT in hepatitis-C subjects was documented pronouncedly high than the controls. These findings are in accordance with the research of Hajarizadeh *et al.*, [35]. In that investigation it was interpreted that, high ALT levels were associated with the presence of HCV virus in serum, especially in intense of hepatitis patients, which could be related with up-regulation of inflammatory cytokines and chemokines. Biosynthesis of ALT occurs in liver cells from there it is delivered into the systemic circulation due to hepatic injury. Additionally, elevated ALT concentration is characteristic of hepatocellular injury and is used as a marker of hepatic damage. Few investigations have established that raised ALT is a prominent indicator of liver fibrosis in HCV infection regardless of HCV RNA levels [33]. In our study, the GGT level was prominently raised in hepatitis-C patients as compared to control. These finding are in agreement with the results of Thamer *et al.*, [36] who established that raised serum GGT is attributed with manifestation of metabolic disorder ultimately leading to cardiovascular events and chronic hepatic malfunctioning. Moreover, raised serum GGT levels indicate presence of bile duct soreness in subjects with HCV infection [37]. As far as blood sugar level is concerned our study documented prominently high glucose levels in infected individuals as compared to control. These results found connection with the findings of Asaduzzaman *et al.*, [38] who presented that HCV affect glucose metabolism through setting off a response against the β-cell of islet that prompts diabetes. The relationship among hepatitis C disease and diabetes have been validated by various investigations in the previous twenty years. In the current study, there was non-significant elevation of creatinine as compared to controls. These findings are in accordance with the work of Dalrymple *et al.*, [39]. Their investigation found that HCV infection was related with a greater incidence of renal disorder characterized by a serum creatinine ≥1.5 mg/dL. Moreover, the chances of renal inefficiency were 40% more noticed among subjects having positive HCV test as compared to the individuals presenting negative test. This study witnessed that hepatitis-C patients have significant elevation in ALP levels. These findings are in consistent with the study of Ijaz *et al.*, [40]. They explained that the higher level of alkaline phosphate suggests that there are chances of liver metastasis, extra-hepatic bile obstruction, cirrhosis and liver inflammation. Higher value of ALP may be an indication of advanced disease progression. A few investigations have indicated that treatment of chronic HCV infection can improve the capacity of influenced organs, hence, reducing the chances of mortality. Moreover, patients with significant HCV signs need to have interferon-free treatment (IFN). Additionally, remedial improvements in the handling of HCV can possibly wipe out or improve HCV extrahepatic alterations in these subjects [22]. Increased glucose level in blood of hepatitis C patients is the main cause of diabetes. Similarly, higher amount of urea, creatinine, albumin, and alkaline phosphate show that kidney is not properly working. The variations of these parameters are the source of renal illnesses which is the prime reason of renal failure in hepatitis C patients. Similarly, uneven concentrations of ALT, AST, bilirubin and GGT may interrupt the normal functioning of liver. As a result, different types of hepatic diseases may occur in hepatitis-C patients.

CONCLUSIONS

The outcomes of these fluctuations suggest that HCV not only affect liver which is the main infection site of hepatitis C virus, but also this virus affect different organs of diseased persons and alter the normal efficiency of these organ.

Authors Contribution

Conceptualization: NR
Methodology: AUR, UJ, MAI
Formal Analysis: MHN, MAI
Writing-review and editing: KM, UJ, NR

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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Original Article

Relationship Between Crown-to-Root Angulation of Maxillary Central Incisor and Lower Lip Line In Different Malocclusions

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ABSTRACT

Collum angle, supplementary angle between longitudinal axis of crown-to-root, is an important consideration in patients receiving orthodontic treatment This angulation in labio-lingual direction is a key factor for proper occlusion and is greatly affected by lower lip line levels in different malocclusions. **Objective:** To find the relationship between collum angle of maxillary central incisor and lower lip line in patients presenting with different malocclusions. **Methods:** Cross-sectional, Comparative Study conducted in Orthodontics department of Nishtar Institute of Dentistry, Multan.From September 2020 to February 2021. Lateral cephalometric radiographs of 105 patients (39 males and 66 females)were selected with age range of 9-30 years. Patients were divided in 4 groups i.e Class I, Class II div I, Class II div II and class III. Collum angle was measured along with assessing lower lip-line level with central incisor. One-way ANOVA test was applied to compare level of lower lip and collum angle. **Results:** Mean value of collum angle was 5.82˚±5˚ for class I, 3.68˚ ± 9˚ for class II div I, 11.7˚± 5˚ for class II div II, and 6.88˚± 7 ˚for class III. Collum angle of maxillary central incisor was greatly increased in patients with class II div II malocclusion than other groups. **Conclusions:** Collum angle found to be highest in class II div II malocclusion group. Lower lip line resting on middle third level of maxillary central incisor crown in div II group explains this exceeding value of collum angle.

INTRODUCTION

A competent smile is part and parcel of attractive facial esthetics and stable occlusion. For the development and maintenance of occlusal integrity and stability, anterior dentition especially maxillary incisors play a pivotal role [1]. Smile attractiveness can be enhanced by the adequate labiolingual inclination of maxillary incisors as per the third key of Andrews's keys to normal occlusion [2]. Morphological disparity and variability of permanent incisor were first studied and analyzed by Bryant *et al.*,. in 1984, who established an important anatomic feature COLLUM ANGLE (CA) and investigated it in different malocclusions [3]. This Crown-to-root angulation in a labiolingual direction, known as Collum angle, is constructed by the intersection of the line along the long axis of the crown and root of a tooth [4]. It is also known as Supplementary angle [5, 6] Ideal collum angle, that is supposed to be zero, plays a vital role and is of great interest to orthodontists during the tooth movement as well as retention phase of orthodontic treatment. This longitudinal axis angulation might act as a limiting factor for lingual root torque added to central incisors within the confinement of the lingual cortical plate of bone [7]. According to R.M. Taylor, the specific supplemental angle between crown and root is widely diversified [8]. Both anatomic structures are liable to different curvature as crowns are bound to be under genetic control & root

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morphology is influenced by environmental factors [9]. These substantially deviated angulations lead to unpredictable force application during orthodontic tooth movements, especially in the vertical plane such as Intrusion and extrusion. Cosmetic defects such as apical migration of gingival margins, and gingival recession, occurring during orthodontic tooth movement, can also be attributed to collum angle. Besides orthodontic considerations, the crown-root angle needs pronounced attention for restorative tooth build-ups as well. During the Prosthetic implant replacement of the tooth with an initially increased crown-to-root angle, using an angulated abutment is essential to reduce the bending stress and prevent a gingival recession. Hence, knowledge of the collum angle and its relation to labial soft tissue in different malocclusions is important. In previous studies, the collum angle has been investigated by using lateral cephalometric radiographs and has been measured in different malocclusion but the relationship of collum angle with lower lip line in patients with different types of malocclusion has not been considered. The current study aimed to determine the relationship between crown-to-root angulation of the maxillary central incisor lower lip line in different malocclusions. Malocclusion was categorized on basis of British standard incisor classification [10]. Establishment of the effect of labial soft tissue on maxillary central incisor will help in planning and execution of tooth movements to maintain stable labiolingual inclination and soft tissue equilibrium.

METHODS

The respective cross-sectional, comparative study was conducted in the Department of Orthodontics of Nishtar Institute of Dentistry (MULTAN) for a duration of 6 months. The period of study was from September 2020 to February 2021.Lateral cephalometric radiographs of 105 individuals (66 female & 39 male) were included in the study. To ensure the standardized accuracy of point identification, all lateral cephalometric radiographs were taken using the natural head position as a reference. Age range of patients included in the study was 9-30 years. Based on British standard incisor classification, patients were divided into four groups: Class I, Class II div I Class II div II & Class III malocclusion. The collum angle and the lower lip line position were assessed on the lateral cephalometric radiograph. Patients with history of orthodontic treatment, prostheses in the anterior zone (implants, posts, dentures), crowding, severe rotation of incisors, trauma, craniofacial anomalies & abnormal central incisor morphology were excluded. Acetate tracing sheet of 0.003-inch thickness and lead pencil of 0.7mm pointer thickness were used for tracing the maxillary central incisor & lower lip. Points were marked on the incisal edge, cementoenamel junction and root apex. The long axis of the crown was drawn by joining a point incisor superius (IU) & mid-point of cementoenamel junction(CEJ). whereas long axis of the root was drawn by extending a line from cementoenamel junction to the root apex(RA). The collum angle was measured between the crown and root axes. All the data collected for study were statistically analysed in SPSS version-20.0 for Windows. After entering values in the software, the analysis of variance (ANOVA) test was used to compare collum angle in different malocclusions & lower lip levels.

RESULTS

Within the sample of 105 patients, 39 (37%) were male patients and 66(63%) were females(Table 1).

Table 1: Demographics with gender and dental class

Gender	Dental Class			III	Mean angle ± SD	N
	I	II	Div II			
Male	11	13	5	10	7.79 ± 4.617	39
Female	12	42	4	8	5.56 ± 4.23	66
Total	23	55	9	18	6.39 ± 4.49	105

Mean age of patients was 16.34 ± 4.99 years Descriptive statistics of Collum angle with age and dental class shown (Table 2).

Table 2: Descriptive statistics of Collum angle with age and dental class

Parameters	N	Minimum	Maximum	Mean angle ± SD
Age(Yrs)	105	9	30	16.34 ± 4.99
Dental Class	105	1.00	4.00	2.12 ± .85
Col Angle	105	.00	16.00	6.39 ± 4.49

Statistical Analysis showed the mean value of collum angle as 6.78 ˚± 3.5˚ for class I, 5.14˚ ± 4.1˚ for class II div I, 12˚ ± 4.2˚ for class II div II and 6.88˚ ± 4.7 ˚for class III malocclusion. The greatest value of the collum angle was found in the class II div II group.(Table.3.)

Table 3: Mean values of collum angle (in degrees)in different malocclusions

Dental Class	N	Mean Collum angle(degrees) ± SD
I	23	6.78 ± 3.53
II	55	5.14 ± 4.13
Div II	9	12.00 ± 4.21
III	18	6.88 ± 4.75
Total	105	6.39 ± 4.49

The location of lower lip line on maxillary central incisor (at incisal third, middle third, or apical third of the incisor) was analyzed in four groups by using the X^2 comparison test. According to this test, lower lip line was shown to significantly contact the middle third of the central incisor in Class II division II group(Table.4).

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Table 4: X^2-comparison test showing Lower lip line position on maxillary central incisor

Dental Class	Lower Lip Position			Total
	Incisal Third	Middle Third	No Contact	
I	22	0	1	23
II	49	5	1	55
Div II	2	6	1	9
III	14	1	3	18
Total	87	12	6	105

ANOVA test showed the mean collum angle to become greatly increased when the lower lip line is in contact at the middle third ($p < .05$) of the central incisor (Table.5).

Table 5: ANOVA test comparing collum angle and lower lip levels in different groups

Parameters		Sum of Squares	df	Mean Square	F	Sig.
Collum Angle	Between Groups	376.46	3	125.49	7.367	.000
	Within Groups	1720.53	101	17.035		
	Total	2096.99	104			
Lower Lip Position	Between Groups	7.539	3	2.513	5.088	.003
	Within Groups	49.89	101	.494		
	Total	57.43	104			

Means plot between Dental class, lower lip line and Collum angle shown in figure 1 and 2.

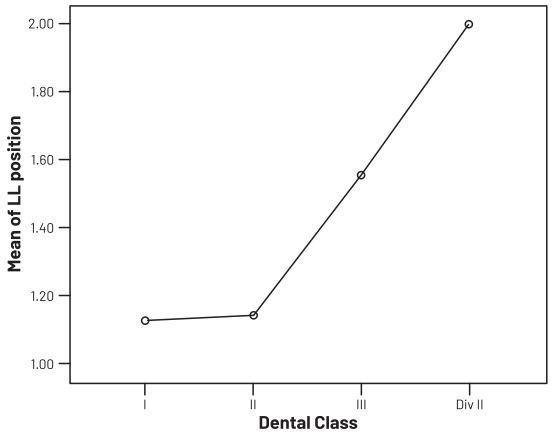

Figure 1: Means Plot between Dental class and Collum angle

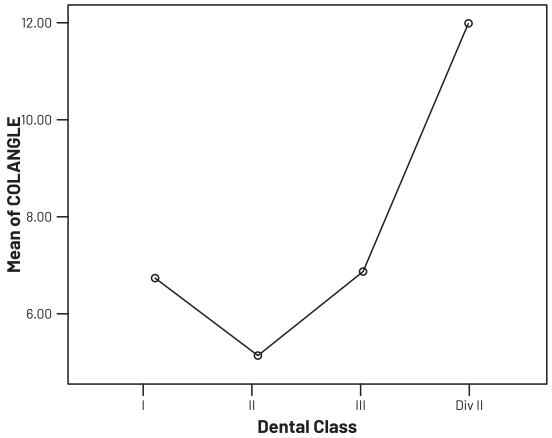

Figure 2: Means plot between Dental class and lower lip line

DISCUSSION

Proper interdigitation is important not only for stable occlusion but also for an esthetic and attractive social smile. As an ideal smile plays a key role in boosting an individual's self-esteem, it has been considered the ultimate goal of orthodontic treatment. Bryant et.al studied the morphological variations and deviations in maxillary central incisor in different malocclusions and came up with the identification of an anatomical feature known as Collum angle. Previously, the long axis of a tooth was considered to be a line from a point on the incisor edge to the root apex but with the identification of the collum angle, a new method has been adopted. The labio-lingual inclination of maxillary central incisors, described as Andrews's third key to normal occlusion, is impacted by the angle between the crown axis and root axis [11]. Our study aimed to compute the value of collum angle in different types of malocclusions and to find out the association between crown-to-root angle and the underlying malocclusion. We aimed to asses the relationship between the location of lower lip line on maxillary central incisors with the associated malocclusion and it's influence on the collum angle. In our study the mean value of collum angle was 6.78° ± 3.5° for class I, 5.14° ± 4.1° for class II div I, 12° ± 4.2° for class II div II and 6.88° ± 4.7° for class III malocclusion. Israr *et al.*, studied the difference in collum angle between class II div-I and class II div-II groups [7]. The average value for the Collum angle in their study showed Class II division 1 sample to be 3.65° ± 3.79° and for Class II division 2, it was 10.03° ± 4.37°. The results of this study were similar to ours. A previous study by Williams and Woodhouse also suggested the crown-to-root angle of the Class II Division-II group to be greater than that of Class I, Class II Division 1, and Class III groups [9]. These results were consistent with our study. Our study showed a significantly increased crown-to-root angle in Class II div II malocclusion group when compared to other malocclusions. A study by Patel showed results similar to ours when crown-to-root angle was calculated for subjects with Class II div II malocclusion [12]. Shailaja *et al.*, reported similar findings stating that crown-to-root shape of maxillary central incisor significantly alters the supplemental angulation and this explains the greater axial angle in the div II group of malocclusion [13]. A cephalometric study in Egypt found the collum angle to be greatly increased in patients with horizontal growth pattern when compared to the vertical growers. Class II div II malocclusion was noted to have a predominant horizontal pattern of growth [14]. This may indicate a genetic influence on the collum angle. According to our study the lower lip line was shown to significantly contact the middle third of the central incisor in Class II division II group when the location of lower lip line on

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maxillary central incisor was analyzed in all four groups of malocclusion. Srinivasan also reported the lower lip line to contact the middle third of the central incisor most frequently in Class II, division 2 malocclusion [15]. The study reported that the labial soft tissue pressure on the maxillary central incisor is also closely related to an increase in collum angle. Patients having malocclusion categorized as class II div II, have their mandible compressed within the maxilla and tongue postured downward. This pattern results in an equilibrium that is in favour of labial soft tissue. Backlund and Logan indicated in their respective studies that lower lip pressure and also genetic pattern considerably affect the collum angle [16, 17]. Lapatki also concluded in his study that lower lip pressure is an influencing external factor resulting in increased angle between the crown-to-root of the maxillary anterior dentition [18, 19]. The results of these studies were consistent with ours. It has been indicated that since the lower lip rests on the middle third of maxillary central incisor in the class II div II malocclusion this may be the reason for an elevated angle in this group. Care must be excersized when incorporating torque in the maxillary central incisors in Class II div II malocclusion where the root lies in close contact with a thin palatal cortical plate. From an orthodontic perspective, the collum angle plays a pivotal role in treatment planning. Forces in vertical dimensions such as intrusion and extrusion in different malocclusions are greatly influenced by the magnitude of angle between the crown and root axis [20]. In the present times, dental implants are considered a more esthetic means of replacing a missing tooth, especially in the maxillary anterior zone. Since collum angle differs greatly among various malocclusions, attention should be paid to morphology and angles of abutment used. Due to the increased bending angle in class II div II malocclusion, certain specifications must be added to the abutment in the anterior zone. Angulated abutments are essential while replacing a tooth with an initial large collum angle. This will help prevent unwanted & damaging cosmetic effects [21].

CONCLUSIONS

Patients with Class II Divison II malocclusion exhibit a greater value of Collum Angle as compared to other groups of malocclusion. The lower lip position largely affects the labiolingual inclination of maxillary anterior teeth. Lower lip line resting on middle third of the crown of maxillary anterior teeth in the class II div II group is an important contributing factor for the significantly greater collum angle in this group.

Authors Contribution

Conceptualization: AK
Methodology: HA, IU, AK
Formal analysis: AA
Writing-review and editing: AF, IK

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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