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EDITORIAL

ARTIFICIAL INTELLIGENCE - A NEW PLAYER IN THE FIELD OF MEDICINE

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The healthcare landscape is evolving at a very rapid pace. Artificial intelligence (AI) is working as a transformative force. The practice of medicine is likely to be revolutionized soon. Optimization of diagnosis and treatment is not very far off. From clinical decision-making to improving patient outcomes along with a reshaping of healthcare delivery system can all be achieved through the help of AI. [1]

AI has the potential to process vast amounts of clinical data with extraordinary accuracy. This is possible through advancements in machine / deep learning and language processing. Meaningful insights can be extracted in this way. Where human perception is perplexed, algorithms of AI can analyze complex data. Personalized management plans can then be chalked out. [2]

Interpretation of medical imaging is another field where AI has tremendous potential to help. AI algorithms are built on huge data of medical images. Rapid analysis of radiological scans and quick picking of abnormalities can facilitate clinicians for prompt action. Statistical analysis has proven that diagnostic accuracy has improved in the fields of radiology, dermatology and pathology by the use of AI. Diagnostic errors are reduced and patient care is expedited/improved. [3]

Understandably when treatment strategy gets optimized by AI, patient outcomes also improve. Based on patient data, guidelines and monitoring, AI algorithms can help clinicians select the most effective therapy with minimal side effects. Hence resource utilization automatically gets optimized. In the field of cardiology and oncology, AI can enable physicians to tailor management for individual patients. This approach enhances precision in medicine with better therapeutic outcomes. [4]

AI-driven healthcare systems can also help in administrative matters. Virtual health assistants can empower patients to schedule their appointments, get information on health care and manage chronic conditions effectively. In the management of the health of the population in general, analytic platforms through AI can identify populations at risk and suggest preventive interventions. Moreover, resource allocation can be strategically planned to improve public health outcomes. [5]

Though AI has tremendous potential in medicine we have to be conscious about ethical issues in adopting it. These issues can be resolved at the level of the ethical committee e.g. if a patient is not willing to any management, his/her wish has to be honoured in preference to AI suggestion. [6] Similarly, social and regulatory issues also need to be addressed. The privacy of patients is of paramount importance along with the security of data. Algorithmic bias has also to be kept in mind while adopting AI-derived healthcare system. Trust building is required for the collaboration of different disciplines of medicine. AI algorithms require transparency. All stakeholders need to be engaged and informed before making any decision. [7] That is how responsible use of AI in medicine can be ensured.

From the above discussion, it can be concluded that a paradigm shift is knocking at the door in the practice of medicine. Unparalleled opportunities are at hand to improve patient care / clinical outcomes. Healthcare delivery seems to be transformed soon. AI-based technology can show new ways of management and research in medicine. Let us hope for an efficient, just, and patient-oriented healthcare system. On this novel journey, we have to be steadfast to imbibe the true spirit of AI and help humanity through different fields of medicine

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ASSESSMENT OF NURSES' ATTITUDE TOWARDS GERIATRIC PATIENTS IN A TERTIARY CARE HOSPITAL OF RAWALPINDI, PAKISTAN

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ABSTRACT

Introduction: *Nurses engage with elderly individuals across various levels of care, yet observations indicate the presence of relational gaps that contribute to adverse outcomes for elderly patients.*

Objective: *This study aimed to assess the factors shaping nurses' attitudes towards the care of elderly patients.*

Study Design: *A descriptive cross-sectional study.*

Place and Duration of Study: *This study was conducted in Benazir Bhutto Hospital Rawalpindi comprising of registered nurses, from August 2023 to October 2023.*

Methods: *A self-administered questionnaire was used as data collection tool using convenient sampling. The sample size of this study was 140. Both male and female nurses having work experience of more than 2 years were included in the study. The nurses who were not residents of Rawalpindi were excluded as they may have different working conditions, patient demographics and healthcare protocols which could skew the results and reduce the study's internal validity. Statistical analysis was carried out using SPSS version 23. Frequencies and percentages were computed, descriptive statistical analysis was done.*

Results: *A total of one hundred and forty nurses were included. About 89(64.0%) were aged between 15-25 years, 45(32.0%) aged between 26-35 years, 6(4.0%) aged between 36-45 years. Regarding attitudes, the majority agreed to have felt good caring for elderly patients except thirty six percent of the participants who felt it was a tedious job. The majority of the participants i.e. one hundred and fourteen individuals (81%) disagreed with the notion that caring for geriatric patients would hinder their ability to attend to other patients. About 80% nurses stated that the mental status and diverse behavioral exhibitions were major hindrances towards effective care of them.*

Conclusion: *The study's findings indicate that the majority of nurses exhibit a positive attitude toward elderly care and demonstrate a solid understanding of geriatric care principles.*

Keywords: *Attitudes, Geriatric patients, Nurses*

INTRODUCTION

The number of elderly persons is growing in almost every country in the world. It is now regarded as one of the humanity's greatest achievements. The paramedical staff especially nurses meet elderly patients at different levels of care.[1] However, the analysis shows that there is a different kind of relationship which is causing a negative impact on the elderly.[2] The purpose of this study was to evaluate nurses' perceptions toward geriatric care. To date, there has been a dearth of research addressing ageism in healthcare in this country.

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Leaders and managers involved in geriatric care should extend their roles in welfare service as well. This is because the decisions and reforms made at this level have a direct impact on the services provided in modern healthcare systems.[3] Despite ongoing inquiries into this matter, concerns about the quality of care persist.[4] A crucial determinant affecting the care provided to geriatric patients is the continued presence and reinforcement of ageist attitudes within the society and among those working in health and social care across various levels.[5] Understanding all aspects of the aging process is crucial along with principles like respect and dignity in addressing the needs of older adults.[6]

Proficient and specialized nurses have a pivotal part in the development of health care systems for the elderly in residential and nursing homes.[7] The establishment of

nursing facilities is frequently guided by the expertise of senior nurses which is influenced by factors like financial resources, the influence of the local nursing community and metrics such as complaint rates. Once these establishments are in place, they tend to undergo infrequent reviews, making it challenging to offer assurances regarding the safety and quality of the nursing care provided.[8]

Nurse administrators cannot effectively articulate nursing demands or allocate nursing resources in the absence of evidence regarding the relationship between patient acuity and reliance and nurse establishments.[9] Nurses who had unfavorable opinions about elderly patients said they would rather work with younger patients.[10] These nurses were more likely to discriminate against elderly patients, employ physical restraints and disregard the patients' autonomy and dignity when providing care.[11]

This study on nurses' attitudes toward elderly patients aimed to identify elements that contribute to discriminatory behavior. This study would assist in improving the quality of nursing care provided to elderly patients. The aim of this study was to explore nurses' knowledge regarding the aging process and identify those aspects which could lead to discriminatory behavior among patients with different age groups.

PATIENTS & METHODS

It was a descriptive cross-sectional study, done on registered nurses in Rawalpindi's tertiary care hospital from August 2023 to October 2023. The study population included nurses which were registered in the tertiary care hospital. The sample size was estimated using WHO calculator. Subjects were chosen using non-probability convenience sampling. The minimum sample size of 140 nurses was based on the prevalence of 61%[12] with required precision of 5%, and 95% confidence interval. A self-administered questionnaire was used for data collection. It had thirty items which included behavioral and attitude aspects as well as sociodemographic characteristics found in other studies. The questionnaires had five sections.

Part A focused on data related to sociodemographic characteristics. Sections B, C, and D examined respondents' attitudes toward nursing care, the nurse-patient ratio, and elderly care as well as factors that affect elderly care. Section E is devoted to the comprehension of the aging process.

The questionnaire was modified based on research studies conducted in Saudi Arabia and Pakistan. Following a thorough assessment of the literature on the local environment and culture a few changes were made to the questionnaire. The supervisor and experts in the field of public health reviewed it. Pilot testing was done on 10% of sample in another tertiary care hospital in Islamabad.

Both male & female nurses with more than 2 years of experience of working in a hospital were included and those which were not residents of Rawalpindi were excluded as they may have different working conditions, patient demographics, and healthcare protocols which could skew the results and reduce the study's internal validity. Statistical analysis was carried out using SPSS version 23. For descriptive statistics, frequency tables, percentage and summary statistics were used.

After taking approval from Ethical Review Committee of National University of Medical Sciences, Islamabad and taking consent by the respondents, the questionnaire was distributed among the registered nurses of a tertiary care hospital. The recommendations of the Ethical Review Committee were adhered to, including informed consent for voluntary participation while maintaining the privacy and confidentiality of the respondent's response.

RESULT

The frequency distribution of the respondents' sociodemographic traits is displayed in Table I. Of the 140 participants in the study, more than half 89 (64.0%) were of age less than 25 years, 43 (32.0%) were between 26 and 35 years of age, 2 (2.0%) were between 36 and 45 years of age, and 5 (4.0%) were older than 45 years.

Table I: Sociodemographic Profile of The Respondents

Demographic Factors	Frequency(n)	Percentage (%)
Gender		
Male	60	43
Female	80	57
Age		
< 25	89	64
26-35	43	32
36-45	3	2
45-55	5	4
Professional Experience		
1-5 years	100	72
6-10 years	26	18
11-15 years	5	4
16-20 years	9	6
Religion		
Islam	110	78
Christianity	30	22
Marital Status		
Married	40	28
Unmarried	100	72

Table II : Nurse's Attitude Towards Care of The Elderly

Variables	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
I feel good taking care of the elderly	4	20	10	30	36
I see the care of elderly patients as being time consuming	5	40	25	20	10
I like tending to younger patients more than I do to elder ones.	10	20	25	25	20
The elderly grow increasingly demanding as they age.	5	17	20	38	20
The elderly are difficult to care for	20	20	10	30	20
Other clients cannot be accommodated while taking care of the elderly.	10	30	30	16	14
It is not worth wasting time on older individuals who have fatal conditions.	46	15	4	9	26
Nurses should not be providing care for the elderly.	30	44	4	12	10

Figure 1: Effect of low nurse-patient ratio on the elderly care

In Table II, results demonstrate the nurses' attitude toward caring for elderly patients. Although nearly 36.0% felt that caring for elderly patients made them feel good, 20.0% disagreed, and 4.0% strongly disagreed.

Over 50 percent of the nurses said that limited staffing could lead to an unbearable workload and stress, which in turn can result in poor care. More than half of the respondents said that a lack of nurses would negatively affect the care provided to the elderly because there

Table III : Factors Affecting the Attitude of Nurses Towards Elderly Care

Variables	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
Specialized training is necessary for providing good care for the elderly	12	8	20	20	40
Hospitals should establish geriatric wards or other dedicated areas for this purpose.	3	13	14	60	10
The elderly patients' mental health has an impact on their decision-making and level of care.	5	10	5	40	40
Different habits in elderly people have an impact on their treatment.	15	18	11	44	12
Convincing reticent patients about their care in the hospital is a challenging task.	13	16	18	42	11
Lack of social support leads to the abandonment of some elderly people.	5	5	10	60	20
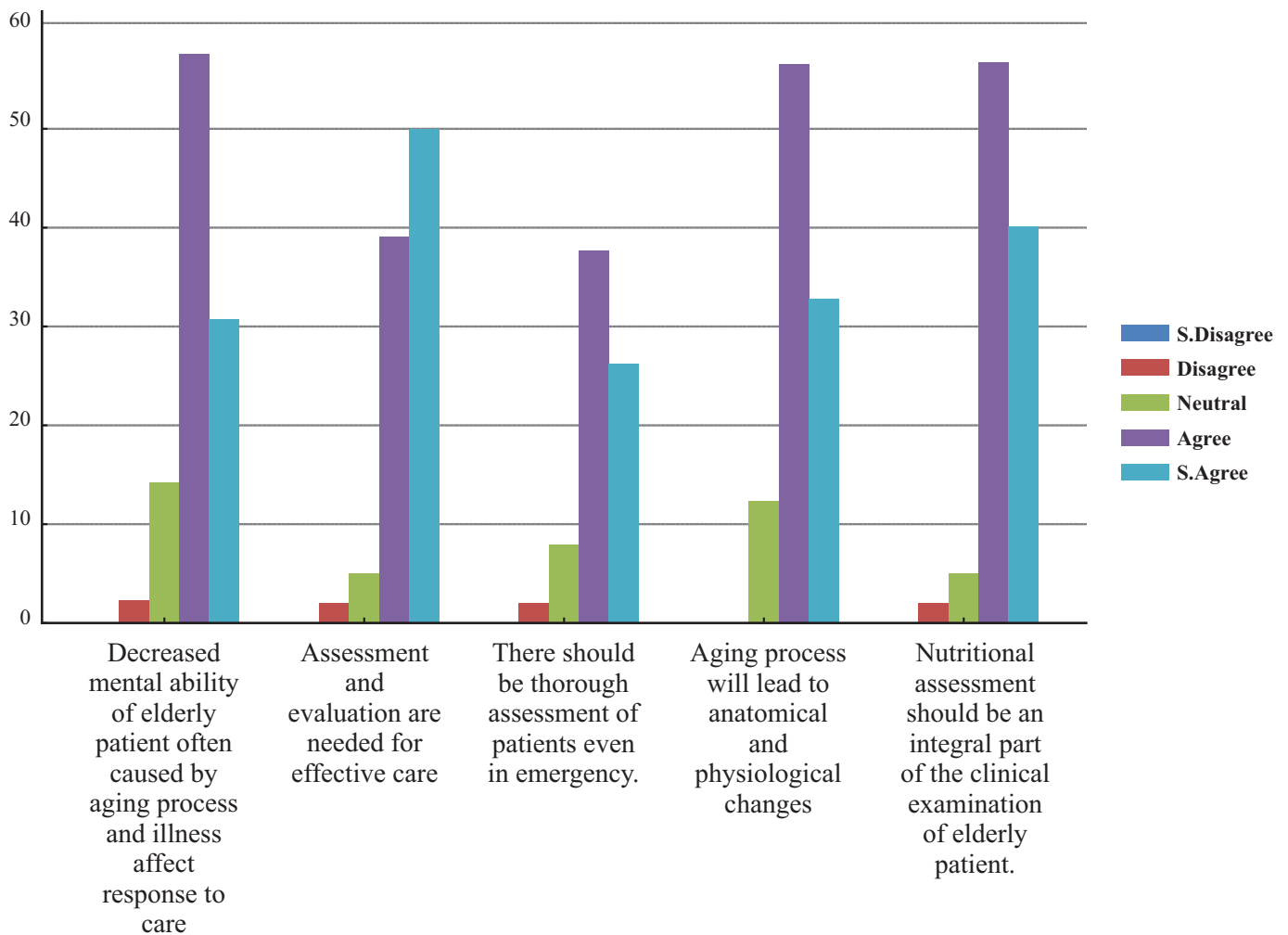
Figure II : Knowledge of the Respondents Regarding Aging Process

would be insufficient knowledge as well as guidance regarding the geriatric health status.

DISCUSSION

In Pakistan gerontological nursing is not yet a well-liked specialization. The majority of nurses included in this research were of the opinion that a specific training was necessary for providing appropriate care for the elderly. Majority of the respondents in this study were females and this result is in line with a study held in Egypt where majority of the participants (62.5%) were female.[16] More than half (78%) of the respondents in our study were Muslims and this is in line to a study in which almost majority of the participants were Muslim.

Majority of the respondents stated they felt good while taking care of the elderly. This contradicts with the study conducted in Ibadan in which 73% of the respondents agreed that elderly patients were difficult to care for.[1] A few respondents also mentioned that caring for the elderly requires more time, effort, and attention than caring for younger patients. This is in line with the study in which majority of the nurses' shows positive attitudes towards older people[14] Some of the factors that make caring for the elderly difficult are having too much work to do and inadequate staffing. Overall, the data suggests that most nurses had a favorable attitude on providing care for the elderly. The outcome is consistent with a study conducted in Turkey, where nurses encounter comparable challenges when providing assistance for elderly patients.[15]

The majority of nurses showed adequate awareness of the aging process including the accompanying changes in structure and physiology. Additionally, the respondents were able to recognize the necessity of properly assessing older patients in all aspects in which they seek care. This is in line with the study held in Turkey where most of the nurses had shown adequate awareness about elderly patient care.[17] Another study held in Egypt showed that majority of nursing staff had a very negative attitude towards elderly care.[16]

Although, we can infer attitudes from behavior, they may appear elusive, but attitudes are still crucial in nursing care. In order to practice in a patient-centered and collaborative manner, nurses should collaborate with others and work on their own attitudes. If we don't comprehend and interpret attitude, our beliefs and values, it becomes quite easy to misinterpret. In this study majority of the nurses stated that specialized training sessions, education and awareness is required to improve geriatric care. This result is in agreement with a study in which more than 80% of the respondents stated that effective care of the elderly needs specialized training.[1] Almost half of the nurses in this study agreed that geriatric patients were more demanding and this finding is in line with other studies in which most of the nurses showed undesirable attitude towards older adults and they considered it to be very boring.[18,19]

Over 80% of the nurses said that a lack of staffing leads to stress and burnout at work which could ultimately lead to poor patient care. This finding is in agreement to a study in which job stress and shortage of staff had an undesirable effect on the quality of life of nurses.[20] In order to establish successful patient care without exhausting the caregivers it is important to address all the factors that could lead to stress and burnout at work place. Another research conducted showed job stressors have a detrimental impact on various areas of respondents' quality of life.[21,22]

It may be possible to design modifications to counteract the negative effects that deplete resources by having a better understanding of the negative implications that caring for difficult older patients has on nurses' energy, capability, confidence, and self-esteem. Earlier research indicated that effective changes and implementing those changes required nurses' participation and peer discussions.[23,24]

Changes designed and implemented by doctors and nurses might prove to be more fruitful than those implemented by the management. Future work would emphasize in evaluating the effectiveness of team work and its impact on patient care.

Due to the small sample size the research findings cannot be generalized to the entire population. The use of convenience sampling may have introduced bias, potentially affecting the results. Additionally, self-reporting questionnaires carry a risk of social desirability bias, where respondents may tailor their answers to align with socially acceptable norms. Furthermore, attitudes toward old age might have been influenced by the participants' level of religiosity.

CONCLUSION

The majority of nurses had a good attitude towards caring for the elderly patients and had a basic knowledge of geriatric care. Limited staffing, difficulties in providing care and addressing the behavioral changes in the elderly are some factors which lead to the unfavorable attitude.

This highlights the necessity for gerontological nursing education in order to provide older patients with high-quality care. Resources and creativity are required to handle this emerging dilemma.

Conflict of interest: The authors declared no conflict of interest.

Authors' Contributions:

Raima Asif: Manuscript Writing, Critical Review

Nasir Javed: Conception of study / Designing , Study Conduction

Uzma Hassan: Critical Review

Tamkeen Jaffry: Critical Review

Rubab Zulfiqar: Experimentation / Study Conduction

Fatima Ali Raza: Analysis / Interpretation

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ROAD TRAFFIC ACCIDENTS AND THEIR ASSOCIATED FACTORS: A RETROSPECTIVE STUDY AT HEAVY INDUSTRIES TAXILA HOSPITAL, TAXILA CANTT

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ABSTRACT

Objective: *To determine the frequency, type of injury and association of age and gender in the pattern of road traffic accident (RTA) injuries.*

Study Design: *Retrospective study*

Study Place: *Heavy Industries Taxila Hospital, allied hospital of HITEC-IMS (Heavy Industries Taxila Education City-Institute of Medical Sciences)*

Duration Of Study: *3 months*

Methods: *This retrospective study was conducted by the Department of Forensic Medicine and Toxicology HITEC-IMS from 15 Oct 2022 to 15 January 2023. Data were obtained from the accident and emergency record register of Heavy Industries Taxila Hospital. The record contained 172 road traffic accident cases. Data from these cases were entered into an approved and pre validated injury surveillance questionnaire recommended by the World Health Organization (WHO). The questionnaire included information such as demographic data for example age, sex and various factor associated with road traffic accidents such as role of human intent, place of occurrence, activity, nature of injury, mechanism of injury and time of injury. Statistical analysis was performed by SPSS version 23.*

Results: *A total of 172 RTA cases were reported in these two years with minor injuries making 52% of total cases. Accidents were most commonly seen in males in the age group of 15-30 years. Most of the road traffic accident victims were commuting via motorcycle/cycle to or from work in the evening hours (12pm to 8pm). The number of cases reported in winter months was greater. Most of the accident cases reported had occurred accidentally without any element of suicide. Patients were then given treatment in hospital and discharged except those requiring continuous care.*

Conclusion: *Road traffic accidents causing minor injuries are frequently reported in Heavy Industries Taxila Hospital, moreover, there might be an association of road traffic accident occurrence with male gender and age group (15-30 years).*

Keywords: *Bruises, Injuries, Lacerations, Road Traffic Accidents*

INTRODUCTION

The term road traffic accident has been defined as a collision or incident that may or may not lead to injury, occurring on a public road and involving at least one moving vehicle; while the respective injuries have been defined as either fatal or non-fatal injuries incurred as a result of a road traffic accident.[1] Today, Road traffic accidents are a very common problem with rates three times higher in low and middle income countries. It is estimated to be the main cause of death in youngsters (5-20yrs of age) worldwide and resulted in approximately 1.35 million deaths in 2016.[2] According to WHO report of 2018, RTA accounts for 14.3 deaths per 100,000 population in Pakistan.[3] Unfortunately, despite the

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increase in traffic crashes 90% of passenger and goods transport still occurs by road in Pakistan and this owes to our improper railway transport system,[4] therefore, further increasing the risk of road accidents. As a result of these accidents, a significant time delay has been seen which directly affects the effectiveness of roadway network, productivity of public and almost 3% loss of gross domestic product.[5,6]

Several studies have been conducted in the past showing the epidemiological characteristics of Road Traffic Accident cases, in which the data has been collected from accident & emergency department of hospitals, ambulance records and police files.[7-10] Study conducted in Karachi has used medico legal autopsies for analysis of RTA cases including different factors such as the cause of death, time since death.[11] A study conducted in Rawalpindi assessed the pattern of RTA injuries using standard surveillance methods and concluded that 31.7% of total patients presented in Emergency room were because of RTA, among which the proportion of males was more than females.[12]

RTA cases are very common in the Rawalpindi district and in its tehsils, resulting in multiple injuries and fatalities, however, very few studies have been done in this regard. This study was conducted to investigate the frequency of RTA cases, to determine the main cause of injuries and find its association with age and gender. This data could help the traffic police of the respective area, by which traffic injuries can be avoided.

METHODOLOGY

This retrospective study was conducted in HIT hospital Taxila Cantt, which is the allied hospital of HITEC-IMS Taxila. The sample size included all RTA cases reported in the years 2021 and 2022 at HIT hospital. All individuals who had experienced road traffic accidents, irrespective of age and gender from January 2021 to December 2022 were included while those road traffic accident cases with incomplete data were excluded. The data were collected from morbidity and mortality register of the hospital on a set and approved questionnaire. The questionnaire used was recommended and approved by World health organization (WHO)[13] and included questions such as demographic details, place, mechanism, human intent and outcome of injury. The data were analyzed by SPSS software version 23.

RESULTS

In our study, 172 cases of road traffic accidents were reported from 1st January 2021 to 31st December 2022. The collected data were entered on SPSS and frequency was determined. The maximum RTA cases were reported in the age group of 15-30 years (n=73,42.4%), while the minimum cases were reported in the age group of < 15years (n=17, 9.9%) table I. Most of the subjects involved in road traffic accidents were males, i.e. 149(86.6%) males and 23(13.4%) females. Thus, most of the injuries occurred in males aged 15-30 years.

Table I: Frequency and percentage of road traffic accidents in various age groups and genders

Age Range	Frequency	Percent	Gender	Frequency	Percent
0-14	17	9.9%	Male	149	86.6%
15-30	73	42.4%	Female	23	13.4%
31-45	45	26.2%	Total	172	100.0%
45 above	37	21.5%			
Total	172	100.0			

RTA cases were reported with different frequency in each of the years (i.e. 17.6% in 2021 and 82.4% in 2022) which is because of inability of people to approach the hospital secondary to security reasons (Figure1). Also, most of the cases were reported in winter months.

Most of the cases were reported in the evening from 12pm to 8pm (n=95, 55.2%) as compared to morning or nighttime (22.7% and 21.8%). Also, most of the cases reported were those which either occurred within Heavy Industries Taxila Cantt or its surroundings (table II).

Table II: The site of accidents and their frequency.

Site of Accident	Frequency	Percent
Within HIT and its surrounding	104	60.5
GT Road	57	33.1
Unknown	11	6.4
Total	172	100.0

The most common cause of injuries was the collision of vehicles as seen in 88 cases while 80 cases out of 172 were reported to be hit by object/animal. Most of these people were travelling for work (n=126, 73.3%) and were on motorcycle/cycle (n=111, 64.5%).

Assessment of the injuries revealed that most of them were minor (bruises, lacerations, minor cuts) in nature (52.3%), followed by moderate (45.3%) and severe (2.3%) as shown below in figure 2; and all were unintentional.
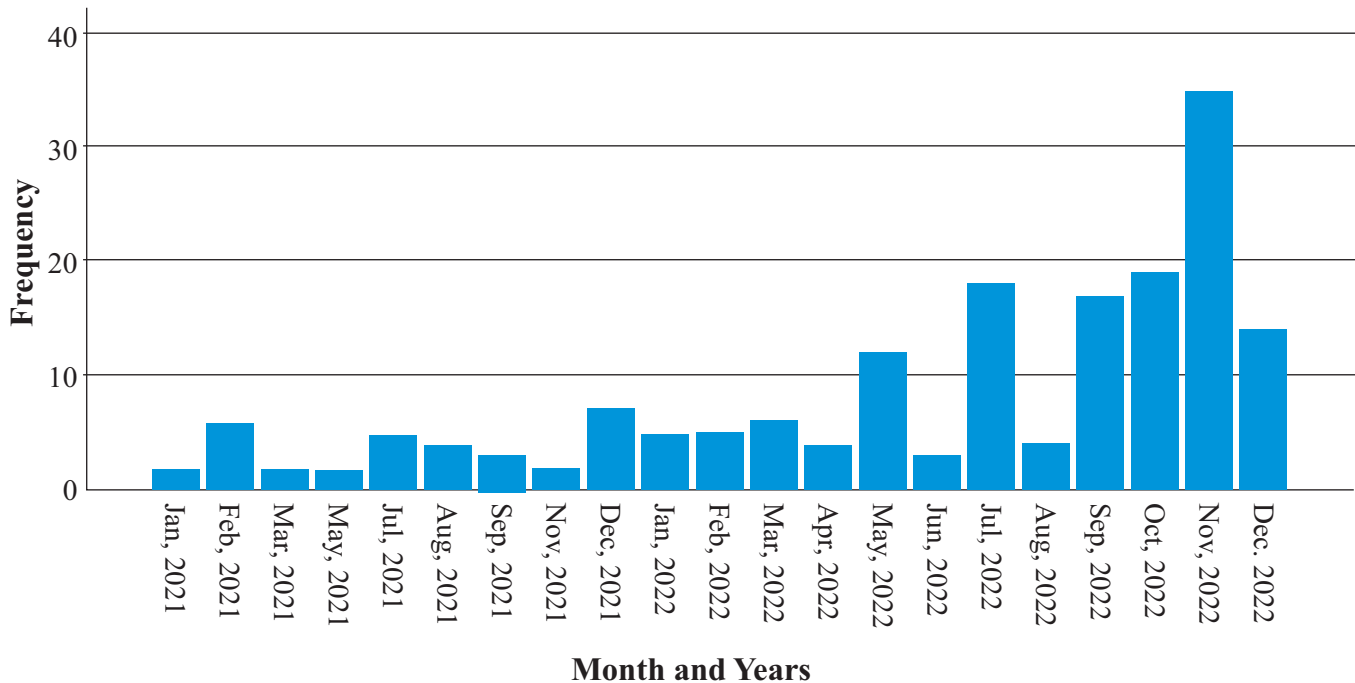
Figure 1: Bar chart showing the frequency of road traffic accidents over the span of two years (2021 & 2022)
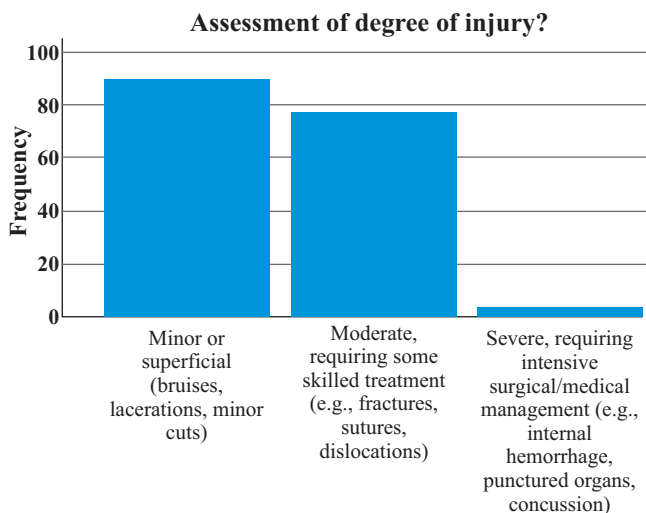
Figure 2: Frequency of minor, moderate and severe road traffic injuries

DISCUSSION

The current study showed a higher frequency of road traffic accidents among men as compared to women. The results showed that 86.6 % of road traffic accident victims were men and 13.4 % were women. A study conducted in southern Europe showed a higher risk of serious and fatal road traffic injuries in men as compared to women.[14] A hospital based cross-sectional study also showed higher frequency of male road traffic accident victims.[15] A study conducted on the pattern and severity of road traffic injuries revealed a higher percentage of male victims.[16] Out of 172 road traffic accident cases 73

occurred in the 15 to 30-year age group. A study conducted in UAE concluded that young individuals were at a higher risk of road traffic injuries.[17]

As far as the cause of accidents is concerned 88 out of 172 cases were caused due to direct collision of vehicles. A study conducted in Iran revealed similar results.[10] However, a retrospective study stated that the major cause of road traffic accidents was the presence of pedestrians and animals on the road.[18] The conflicting results might be due to differences of environments and road conditions in both studies.

The percentage of minor, moderate and severe injuries was 52.3%, 42.3% and 2.3% respectively. A similar study has shown that lacerations and abrasions were most common followed by bruises. External limb injuries and right sided fractures were also common.[16]

The data of 172 people showed that men were more likely to be involved in a road traffic accident as compared to women and in individuals aged 15 to 30 years. This finding correlates with the fact that there are more male drivers in Pakistan as compared to female drivers.

Young men are predominantly handling various vehicles whether trucks, cars, motorbikes thus resulting in relatively higher accident rates in men particularly in the 15 to 30 years age group. Research on RTAs in Rawalpindi city stated that women aged 15 to 24 were less likely to suffer from RTA injuries.[12] Moreover, WHO Global Status Report 2018 concluded that most victims

were pedestrians, cyclists & motorcyclists between ages of 5 to 29 years.[13] RTAs were common during 12 pm to 8 pm time period which includes rush hours during which the number of vehicles on roads is increased, substantially raising the risk of RTAs. Most of the RTAs occurred during the winter months, i.e. October to December, which may be due to reduced visibility due to heavy fog. Research conducted on the contribution of environmental factors has also established the link of different weather conditions like rainfall and fog with the incidence of RTAs.[19] In contrast to our study, another research paper has concluded that majority of road traffic accidents occur at night and on holidays and has also revealed that serious road traffic accidents were more likely to occur during off peak hours rather than peak hours because of moderate speed of vehicles and vigilance of traffic personnel during these hours.[6]

In our study, out of 172 cases 126 RTAs involved work related travel which included either traveling to or from the workplace. Most of the accidents involved a direct head-on collision between two vehicles. The most commonly involved vehicle was the motorbike. The second leading cause was collision with an animal, since there are stray dogs, jackals, boars etc. in the surrounding areas. These animals were specially encountered on roads that linked to adjoining villages.

CONCLUSION

RTA injuries reported in HIT hospital were mostly those which occurred either within HIT or surroundings areas despite the good traffic system and condition of roads. Most of the accidents have occurred in evening during rush hours in young males riding motorcycles and travelling to and from work.

Moreover, the number of cases reported in winters was more as compared to warmer months.

LIMITATIONS OF STUDY

Mortality rate could not be calculated.

Conflict of interest: The authors declared no conflict of interest.

Authors' Contributions:
Maria Sattar: Conception of study / Designing / Planning, Experimentation / Study Conduction, Analysis / Interpretation/Discussion, Manuscript Writing
Rubace Fatima: Analysis / Interpretation / Discussion, Manuscript Writing
Muhammad Asif Shahab: Critical Review, Material Analysis
Romana Masood: Critical Review, Material Analysis
Jawaria Sattar: Analysis/Interpretation / Discussion, Manuscript Writing

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FREQUENCY OF POSTPARTUM DEPRESSION AND ITS EFFECTS ON QUALITY OF LIFE AMONGST MOTHERS ATTENDING EPI CENTER, PIMS ISLAMABAD

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ABSTRACT

Objectives:

- *To assess the prevalence of postpartum depression.*

- *To assess the effects of postpartum depression on quality of life.*

Study Design: *Cross sectional study design and Non probability convenient sampling technique was used.*

Study Place & Duration: *Data were collected in EPI centre, PIMS (Pakistan Institute of Medical Sciences) Islamabad over a duration of eight months (October 2022 to May 2023).*

Materials and Methods: *Demographic questionnaire, Edinburgh Postnatal Depression Scale (EPDS) Urdu version [1] was used to assess frequency of postpartum depression and WHOQOL-BREF [2] (World Health Organization Quality of Life Brief Version) to assess the quality of life of the participants.*

Consent was obtained from all participants before they completed the questionnaire. SPSS version 25 was used for data analysis. For categorical and continuous variables, frequency was calculated. Chi square was applied. P value of less than 0.05 was considered statistically significant.

Our study population is mothers of infants presenting in EPI centre of PIMS. Sample size of 240 was calculated using WHO sample size calculator with 95% confidence level and 5% margin of error.

Results:

- *Overall, 66.3% of the population had postpartum depression (PPD) according to EPDS.*

- *10.8% participants with postpartum depression scored 45 or below on WHOQOL (World Health Organization Quality of Life) scale showing low quality of life.*

- *68.3% participants with postpartum depression scored between 46 and 65 on WHOQOL scale showing moderate quality of life.*

- *20.8% participants with postpartum depression scored 66 or above on WHOQOL scale showing high quality of life.*

Conclusion: *This study shows that frequency of postpartum depression is very high in our society and has a substantial effect on the quality of life of mothers.*

Keywords: *Depression, Mothers, Postpartum, Quality of Life*

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INTRODUCTION

The main purpose of this research was to identify the frequency of postpartum depression amongst women who have given birth in the last year, and to assess the consequences of this depression with respect to their quality of life. Till date of this writing no similar research was found

to be conducted on the mothers presenting to EPI centre, PIMS Islamabad.

Postpartum depression is a major public health problem faced by mothers (after having a baby), worldwide and nationally and it affects quality of life of these mothers.

Postpartum depression is a mental condition that affects women during or after pregnancy.[3] The onset of postpartum depression generally appears during 4 to 6 weeks of delivery. Childbirth marks as one the major happenings in a woman's life. The sudden addition of new responsibilities leads to increasing risk for the development of postpartum depression during this period.[4]

Postpartum depression affects almost 20% of mothers annually around the world.[5] Only about 50% of these women are diagnosed.[6] The condition is seen to be much more prevalent in developing and underdeveloped countries.[7] Throughout Asia postpartum depression was found to range between 3.5%(Malaysia) and 63.3%(Pakistan).[8] Its prevalence was found to be about 11% in China[9], 22% in India[10], 38.8% in Iran[11] 39.4% in Bangladesh[12] and 56.2% in Afghanistan.[13]

The prevalence of postpartum depression within Pakistan also varies from province to province and city to city with 19.3% in Sindh[7] and 41% in Punjab. A study at two tertiary care hospitals in Peshawar estimated a frequency of postpartum depression to be 62.7% in RMI and 37.3% in HMC.[14]

The symptoms, which are quite similar to Major Depressive Disorder, includes, mood swings, loss of energy, decreased concentration, loss of interest, disturbed sleep, loss of appetite, feelings of insignificant guilt, anxiety, and suicidal thoughts.[15] Postpartum depression must not be confused with baby blues which include mild symptoms of depression. They generally peak within four to five days after child's birth and subsides within a few days.[16]

Despite the advances in diagnosis and treatments, postpartum depression is still one of the most under diagnosed and misconceived condition because mothers may not always be comfortable to discuss their mood changes with the health care provider or someone close.[5]

Postpartum depression affects new mothers as proved by evidence. Women with postpartum depression undergo multiple changes during this period which includes biological, social and emotional changes. As a result, postpartum depression can greatly affect the quality of life of these women.[9] It had been observed that women with postpartum depression have lower scores on QOL dimensions than those without postpartum depression during fourth to sixteenth week of postpartum.[17] Taking care of themselves and the additional responsibility of the baby after delivery can negatively impact the mother's QOL. Furthermore, they also face challenges that have an impact on their physical QOL, like fatigue, haemorrhoids, back pain, urine incontinence and perineal pain etc. The tiredness, changes in body shape and increased responsibilities might also cause changes in the intimacy with their spouse.[18] The purpose of the study was to analyse the frequency of postpartum depression and spread awareness about this grave issue. This would help in improving quality of life of mothers by timely diagnosis and treatment.

MATERIALS AND METHODS

A cross sectional study design was used. Non probability, convenient sampling technique was applied and a sample size of 240 was calculated using WHO sample size calculator with 95% confidence level and 5% margin of error. The study was conducted in EPI centre, PIMS Islamabad. All mothers having infants presenting in EPI centre were included in the study however mothers having past psychiatric disorders or those on psychiatric medications and those not willing to participate in the study were not made a part of the study. The study was conducted over a duration of eight months, starting in October 2022 and continuing until May 2023. For data collection purpose three questionnaires were combined, a demographic questionnaire, Edinburgh Postnatal Depression Scale (EPDS) Urdu version [1,19,20] to assess frequency of postpartum depression and WHOQOL-BREF (World Health Organization Quality of Life Brief Version) to assess the quality of life of the participants. The participants manually filled the questionnaire with written consent. Data were analysed using SPSS version 25. For categorical and continuous variables, frequency was calculated. Chi square was applied. *P* value of less than 0.05 was considered statistically significant.

RESULTS

In the current study overall 66.3% of the participants were positive for postpartum depression (PPD) according to EPDS

Out of the 10.8% participants having low QOL, 80% had postpartum depression. Out of the 68.3% participants having moderate QOL, 70.7% had postpartum depression. Out of the 20.8% participants having high

QOL, 41% had postpartum depression. The effect of postpartum depression on quality of life is highly significant (p=0.00). Association between postpartum depression and history of trauma during delivery is significant (p=0.002).

Postpartum depression was found to be more frequent among younger age groups. Three participants were below 20 years of age out of which 72% had postpartum depression, 72% participants were between 21 and 30 years of age out which 68% had postpartum depression. Twenty five percent participants were between 31 and 40 years of age out which 59% had postpartum depression. No participant of age 41 years or above, participated in the study. Among the age group of less than 20, none of the participants had low quality of life, 85.7% had moderate quality of life and 14.2% had high quality of life. Among the age group of 20-25, 11.8% of participants had low quality of life, 69.7% had moderate quality of life and 18.4% had high quality of life. Among the age group of 26-30, 9.27% of participants had low quality of life, 67% had moderate quality of life and 23.7% had a high quality of life. Among the age group of 31-35, 12.7% of participants had low quality of life, 68.08% had moderate quality of life and 19.14% had high quality of life. Among the age group of 36-40, 16.6% of participants had low quality of life, 66.66% had moderate quality of life and 25% had high quality of life

Out of mothers living in joint families 68.5% had postpartum depression while 61.7% of those living in nuclear families had postpartum depression. Out of the 159 participants living in joint families, 13% had relatively low quality of life, 66.66% had moderate quality of life and 20.1% had relatively high quality of life. Out of the 81 participants living in nuclear families, 6.17% had relatively low quality of life, 71% had moderate quality of life and 22% had relatively high quality of life.

Out of the employed mothers 74% had postpartum depression, while 64 percent of mothers who were unemployed had postpartum depression making it 10 percent more common among working mothers.

Out of the total unemployed mothers, 11.5% had relatively low quality of life, 67.8% had moderate quality of life and 20.5% had relatively high quality of life. Out of the employed women 8% had relatively low quality of life, 70% had moderate quality of life and 22% had relatively high quality of life.

Table I: Demographics of Participants

Variable	Percent
AGE	
< 20	2.9% (7/240)
20-25	31.7% (76/240)
26-30	40.4% (97/240)
31-35	19.6% (47/240)
36-40	5.4% (13/240)
> 40	0% (0/240)
EDUCATION	
Illiterate	10.0% (24/240)
Primary	10.4% (25/240)
Secondary	25.0% (60/240)
Graduation	31.7% (76/240)
Post-graduation	22.9% (55/240)
OCCUPATION	
Housewife	79.2% (190/240)
Working	20.8% (50/240)
FAMILY TYPE	
nuclear	33.8% (81/240)
Joint	66.3% (159/240)

■ **Postpartum depression present**

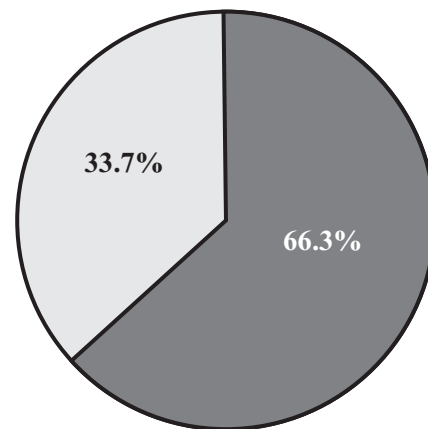☐ **Postpartum depression absent**

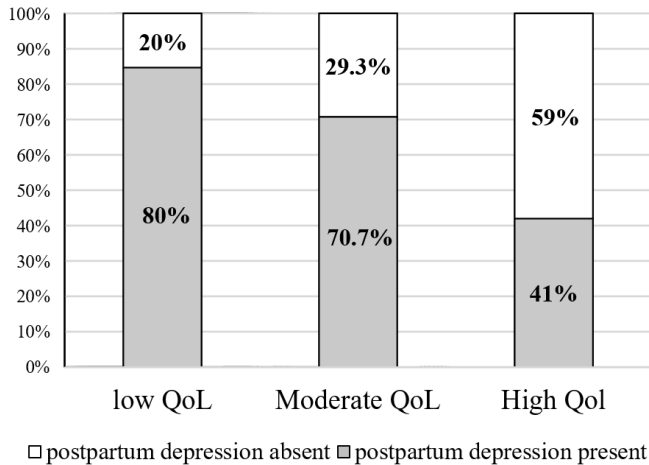**Figure 1: Frequency of Postpartum Depression among Participants**

Figure 2: Effect of Postpartum Depression on Quality of Life of Participants
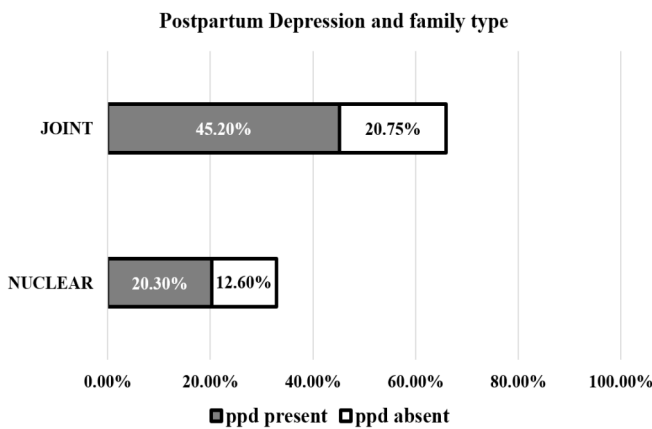

Figure 3: Association of Postpartum Depression with Family Type

DISCUSSION

The study showed that, 66.3% of the population had postpartum depression according to Edinburgh Postnatal Depression Scale. This was consistent with a research on prevalence of postpartum depression in Asian countries which ranked Pakistan the highest with 63.3% while Malaysia was ranked lowest with prevalence of 3.5%. [8]

Women of age less than 20 years were 3% of our study population out of which almost 72% were positive making them the most prone to postpartum depression. This aligns with a systemic review to check the prevalence of postpartum depression among mothers of India, in which it was observed that postpartum depression was more common in mothers of age 25 or less than mothers above 25 years[10] however a study conducted in Sri Lanka in 2017 for prevalence of postpartum depression and risk factors associated with it shows that mothers older than 35 were more prone to develop postpartum depression. [21]

It was found that women who reported to have low quality of life showed highest percentage of postpartum depression with 80% of them being positive and 20% negative. Of those scoring moderate quality of life, 60% were positive and 40% were negative for postpartum depression. However, the women with high quality of life showed only 25% being positive and 75% negative for postpartum depression. Similarly, 38 researches from year 2000 to 2016 were analysed for a systemic review to check the prevalence of postpartum depression among mothers of India in which many risk factors were also reported and the most common of them was financial issues.[10] In comparison, in a cross-sectional study to compare the cases of postpartum depression of public sector with private sector it was found that frequency of postpartum depression in Hayatabad medical college (public sector) was 37.3%, p value for which was 0.001 and that of Rehman medical institute (private sector) 62.7%. [14]

According to this study, women living in joint families had a higher percentage (45%) of postpartum depression as compared to those living in nuclear families. In comparison, a clinic based cross-sectional review was directed on 426 ladies the results of which shows that prevalence of postpartum depression was 17.4% and the factors contributing to postpartum depression include age of mother, number of children and family type as postpartum depression was more common among mothers with nuclear family type and a major contributing factor was unwanted pregnancy.[22]

Out of all the participants who were working mothers 73.9% mothers were positive while 63% of housewives were positive showing a comparatively higher rate in working mothers This contradicts the study conducted in China which showed that house wives out of other occupations had highest prevalence of postpartum depression.[9]

CONCLUSION

This study shows a high frequency of postpartum depression in our society (66.3%), significantly affecting the quality of life of mothers. Public awareness campaigns and increased resources are needed to improve postpartum mental health and, consequently, the well-being of both mothers and their babies.

LIMITATIONS OF OUR STUDY

The participants' quality of life was not analysed before the study due to short study duration. So before and after could not be compared. The sample size taken was only

for PIMS, Islamabad due to limited resources. No mother of age 41 or above participated in the study.

Most of the participants involved in the study had a moderate quality of life and an equal representation of all types of quality of life was not present.

ETHICAL STATEMENT

Confidentiality was maintained throughout the study period.

Approval was taken from Ethical Review Board.

Conflict of interest: The authors declared no conflict of interest.

Authors' Contribution

Zaupash Mahmood, Mahnoor Noman, Fakiha Naeem, Ayesha Khan: Topic selection

Fakiha Naeem: Questionnaire development

Fakiha Naeem, Ayesha Khan, Mahnoor Noman, Zaupash Mahmood: Methodology

Zaupash Mahmood, Mahnoor Noman, Fakiha Naeem, Ayesha Khan, Fatima Naeem, Dr. Hajr-e-aswad Khan Khattak: Data collection

Ayesha Khan: Data Analysis

Fakiha Naeem: Manuscript Writing

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PREVALENCE OF ASTIGMATISM IN MYOPIC PATIENTS
A STUDY DONE AT HITEC IMS

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ABSTRACT

Objective: *The objective of this study was to find the prevalence of astigmatism in myopic patients concerning age and gender.*

Study Design: *It was a descriptive study.*

Settings: *It was done at HITEC-IMS Taxila from March 2022 to July 2022.*

Methodology: *In our study, 370 patients were included, all of them were myopic. Patients with complaints of blurred vision and age 18 to 40 years were included in our study. Patients who had undergone LASIK surgery or had congenital myopia were excluded from our study.*

Results: *Astigmatism was 77.3% in myopic patients, 44.6% were males and 55.4% were females. Prevalence was high in patients 29-31 years old.*

Conclusion: *Astigmatism was more prevalent in myopic patients, ranging from 29 to 31 years of age.*

Keywords: *Astigmatism, Myopia, Lasik surgery, Congenital Myopia, Ametropia*

INTRODUCTION

Astigmatism is the most prevalent ametropia in individuals. Even less has been discovered about the origin of astigmatism and the facts surrounding the spherical and astigmatic refractive error relationship.[1] According to WHO data published a few years ago, half of the world's population (about five billion people) will be myopic in 2050. Only if there is no change in people's lifestyles, no lifestyle adjustment, and no adoption of prevention techniques would the expected outcomes be completely accurate.[2] With increasing age, the likelihood of astigmatism more than one diopter reduces.[3] These people require spectacles and visual aids with ophthalmic corrections since their optical derangements differ from those with emmetropic eyes.[4] In children, astigmatism is a prevalent eyesight condition. Uncorrected astigmatism has been linked to refractive problems including myopia and amblyopia in previous research. It is critical to discover and correct astigmatism as soon as possible to avoid the potential impact of undetected astigmatism on a child's normal eyesight development. The exact reason for astigmatism in children is not discovered yet. Juvenile age group, people belonging to Spain, African American ethnicity, the existence of significant vision impairment (myopia or hyperopia), as well as maternal smoking during pregnancy, have all been established as risk factors for astigmatism in young children in the United States.[5]

Astigmatism is associated with the establishment and progression of myopia in children in several studies (reviewed in Grosvenor & Goss, 1998). The relation of early-onset myopia with against-the-rule astigmatism is occasionally the reason for spherical equivalent and cylindrical refractive error. Neonates with against-the-rule astigmatism and a negative spherical equivalent experienced early onset of myopia at an early age than neonates with either with-the-rule or no astigmatism,

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according to a longitudinal study of refraction. In young children, astigmatism against the rule is an indication of the occurrence of myopia later in life and faster progression of existing myopia. These results show that there is a link between cylindrical refractive error and spherical equivalent.[6]

Astigmatism has been linked to the development of amblyopia as well as the advancement of myopia. When astigmatism is present in a growing visual system, its consequences may be more pronounced.[7] Myopia, according to the studies, is a major public health issue that requires prompt planning for comprehensive vision care services to prevent rapid growth in high myopia. Time spent outside and less time spent indoors, including increasing use of electronic devices and activities that require close focus, can be part of effective preventive efforts, as can new coping techniques, under-correction, Bifocals, Pals, or pharmaceutical therapies.[2]

The incidence of astigmatism is increasing in children as well as young adults. This study aimed to find the relation between myopia and astigmatism and to take proper measures to overcome the disease. To assess astigmatism, patients were examined by an autorefractometer.

MATERIALS AND METHODS

It was a descriptive study, done from March 2022 to July 2022.

Refraction data was collected from 370 subjects, who were all myopic. In our study, there were 165 males and 205 females. The sample was collected through convenience sampling. This study was approved by the institutional review board. Patients visiting eye OPD with myopia and with complaints of blurred vision were included in the study. Patients aged 18 to 40 years were included in our study and patients who had undergone LASIK surgery or had congenital myopia were excluded from the study. No patient had strabismus, cataract, or significant eye disease.

Informed consent was obtained from patients before collecting their data. The data were collected by examining patients on an autorefractometer and their age and gender were noted and analyzed on SPSS.

RESULTS

A total of 370 patients were tested for astigmatism, there were 44.6% males (n=165) and 55.4% (n=205) were females. All of the patients were myopic, of age ranging from 18-40 years with a mean age of 28 years $\pm$ 3 months, S.D. 6.0. In 77.3% (n=286) of patients

astigmatism was present. Astigmatism was more prevalent in females 55.4% (n=160) as compared to males Phi=0.20, Prevalence of astigmatism was high among the age group of 29-31 years, Phi=0.3.

Table I: Shows distribution of gender and presence of astigmatism

Gender	Males	44.6%	**(n=165)**
	Females	55.4%	**(n=205)**
Presence of astigmatism	Yes	77.3%	**(n=286)**
	No	22.7%	**(n=84)**

Table II: Correlation of Gender with Astigmatism

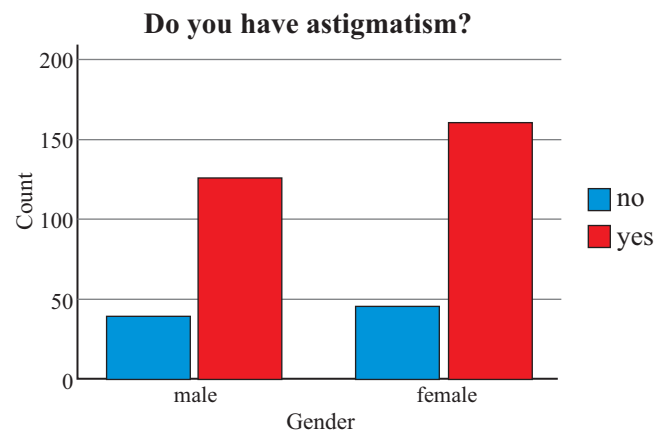|		Presence of astigmatism		Total
		No	**Yes**	
Gender	**Male**	39	126	165
	Female	45	160	205
Total		84	286	370

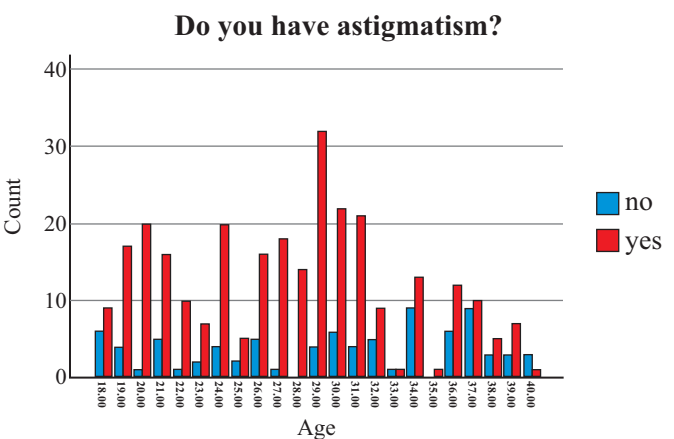**Figure 1: Distribution of Astigmatism among males and females**

Figure II: Shows Distribution of Astigmatism According to Age Group

DISCUSSION

In this study, we studied the relationship of astigmatism

with age and gender in myopic patients. 77% of patients had astigmatism, out of the 44.6% were male and 55.4% were female. This shows that astigmatism is more prevalent in females than in males. We studied patients from the age of 18 to 40 years, our study showed that it is more prevalent in 27 to 32 years of age. In these patients, we looked at the connection between astigmatism with age and gender. Astigmatism is more common in women than in men, according to this study. Astigmatism is caused by asymmetries in the anterior portion of the eye. Asymmetries include ocular curvature or dispersion, frontal curvature, decentration, or slant, and position of the pupil.[8] The occurrence of astigmatism is largely associated with age and other factors, according to several research. Some researches, however, show no association in the occurrence of astigmatism in children aged 6 to 12, while the bulk of studies show a considerable drop in astigmatism from birth to puberty, followed by an increase in adulthood.[9] According to one study, children had a 15% prevalence of astigmatism, whereas adults had a 40% prevalence. This indicates that astigmatism is more common in adults than in youngsters. The prevalence of astigmatism, on the other hand, varies widely between studies, ranging from 0.3 percent in Thailand to 91.9 percent in Benin. South-East Asia has the lowest prevalence of astigmatism, while Americans have the highest prevalence. However, astigmatism is very common in the Eastern Mediterranean and Western Pacific regions.[10] According to a study conducted in Singapore, astigmatism is less common in Singapore school children than in Singapore adults and teenagers[11] This is consistent with our findings, which show that adult prevalence is high. According to studies conducted in Poland, Malaysia, China, and Ethiopia, children aged 6 to 12 years have a decreased prevalence of astigmatism.[9]

Gender has a major effect on astigmatism, with males being positively associated with RA and poorly associated with CA. The occurrence of RA increased with advancing age and was most common in those who were >70 years old, according to one study; age was a prime predictor of RA, associated with an increased chance of occurrence of the refractive change in middle age; and a directional shift in the degree and type of RA was also identified with age.[12] Refraction studies in children have revealed that astigmatism development in childhood is a dynamic process, with newborns having a high incidence of astigmatism, which is predominantly corneal in origin. The cornea flattens in early childhood, reducing the degree of astigmatism. Up to the age of four years, the prevalence of greater degrees of astigmatism is minimal. However, it should be emphasized that CA is more prevalent in the younger age group (5–10 years) than in the older age group.[12] Although one study found no difference in the prevalence of astigmatism between men and women, the results of other studies in this area are mixed. Females were found to have a higher prevalence in some studies, whereas males were not shown to have a higher incidence in others.[9] According to a Chinese study, the frequency of astigmatism in preschool children varies by area. According to previous studies, the prevalence of astigmatism ranged from 4.0 to 25.4 percent depending on the defining criteria used. According to research conducted in Wuxi, 36.0 percent of preschool children had astigmatism.[13] According to a study conducted in YiWu, the overall prevalence rate of astigmatism was 14% for astigmatism of 1.5 D or larger and 2% for high astigmatism of 3.0 D or greater. Astigmatism was more common in male students as they progressed through the grades. Astigmatism prevalence varies with race and ethnicity, as is well documented[14] In different studies and populations, the prevalence of astigmatism varies. This difference could be caused by age, gender, or environmental variables. In comparison to previously published research, the findings of a Chinese study showed a significant prevalence of astigmatism in Chinese preschool children. Astigmatism (>1.00 D) was detected in 21.1 percent of preschool children in that study (mean age 55.7 months). According to Howland et al, one out of every ten children aged 4 and up had astigmatism of 1.00 D or more. According to Dobson et al, astigmatism of 1.00 D or greater was identified in 25% of children aged 1–48 months. Mayer also discovered that astigmatism (>1.00 D) affected 25% of children in the same age group. Astigmatism is common among Chinese people.[15]

CONCLUSION

Astigmatism was more prevalent in myopic patients, ranging from 29 to 31 years of age.

Further studies are needed on this subject to find the correlation between myopia and astigmatism.

Conflict of interest: The authors declared no conflict of interest.

Authors Contribution

Najeeba Harim: Analysis / Interpretation / Discussion, Manuscript Writing, Experimentation / Study Conduction

Shahzad Waseem: Conception of study / Designing / Planning, Experimentation / Study Conduction

Dilshad Alam Khan: Conception of study / Designing / Planning, Critical Review

Umm e Aiman: Experimentation / Study Conduction, Facilitated for Reagents / Material Analysis

Syed Muhammad Ali Haider: Analysis / Interpretation / Discussion, Manuscript Writing

Warda Altaf: Manuscript Writing

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BACTERIAL ISOLATES AND THEIR SENSITIVITY PROFILE FROM CSF SAMPLES – A 5 YEAR STUDY AT A TERTIARY CARE HOSPITAL

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ABSTRACT

Objective: *The aim of the study was to evaluate the frequency of various bacteria isolated in cases of meningitis and their sensitivity profile.*

Study design: *Descriptive Cross sectional study*

Study place & duration: *Study place & duration: This study was carried out at Fauji Foundation Hospital Rawalpindi over a period of 5 years (January 2017 and December 2021).*

Methodology: *All CSF samples received in microbiology Lab during the study were centrifuged at 2500 r/min in the laboratory of Microbiology. The supernatant fluid was discarded. The sediment was inoculated on blood agar, Chocolate agar and MacConkey's agar and were incubated at 37^0C for 24-72 hours aerobically and in 5 % CO2. Cultures that yielded growth of any bacteria were further proceeded by standard microbiological methods of bacterial identification and sensitivity testing according to CLSI guide lines.*

Results: *A total of 2000 CSF samples were received during the study period examined. One hundred and fifty seven samples yielded growth of bacteria. Pseudomonas aeruginosa (30%) was the most frequent organism isolated from CSF from patients followed by methicillin resistant Staphylococcus aureus MRSA (13%).*

Conclusion: *Pseudomonas aeruginosa was the most frequent organism isolated from CSF of patients of meningitis followed by MRSA.*

Key words:

Cerebrospinal fluid, Hospital Acquired Infection.

INTRODUCTION

Medical emergencies like bacterial meningitis always have significant mortality rates. The most common and effective way to confirm the diagnosis of bacterial meningitis is cerebrospinal fluid (CSF) culture. The subarachnoid spaces of the cranium and spine, as well as the ventricles of the brain, are home to the ultra-filtrate of plasma known as cerebrospinal fluid (CSF). CSF helps to remove metabolic waste from the brain, including peroxidation products, glycated proteins, extra neurotransmitters and debris from the ventricular lining, including bacteria, viruses, and other pointless substances.[1] A prevalent clinical infectious disease that is mostly brought on by bacteria entering the brain and spinal cord is central nervous system infection (CNS). Different microorganisms can infect CSF and cause illness.[2] Bacterial meningitis is the one of the serious diseases associated with substantial morbidity and mortality rates. The most common organisms isolated

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from samples of bacterial meningitis are *Streptococcus pneumoniae, Neisseria meningitidis,* and *Haemophilus influenzae*.[3] Microbiology laboratories commonly receive CSF or blood specimens from patients with meningitis or unexplained febrile illness. Presumptive identification of *Neisseria meningitidis, S.pneumoniae,* and *H.influenzae* is sometime possible on the basis of cytological/microscopic examination of CSF.[4] Different methods exists for the diagnosis of bacterial meningitis of which CSF   culture is still considered the gold standard.[5] This treatment is often complicated by infection of shunt usually because of biofilm forming bacteria.[6] Catheters used as CSF shunts are foreign bodies that can become infected with bacteria. The most common organisms in this case is *Coagulase negative Staphylococci* followed by *Staphylococcus aureus*.[7] Gram negative bacteria and candida species are sometime also isolated. These organisms are usually thought to be introduced at the time of surgery. The incidence of shunt infections ranges from 10% -22% and its incidence is around 6% per procedure. Around 90% of these infections occur usually in first 30 days after the procedure. *Neisseria meningitidis, S. pneumoniae, Hemophilus influenzae, E. coli,* and *K. pneumoniae* were shown to be the most frequently isolated bacterial etiologic agents from CSF cultures, according to recent investigations. The introduction of vaccines in the Extended Program of Immunization (EPI) against *Pneumococci* and *H. influenzae* type b has significantly reduced the burden of bacterial meningitis caused by these agents. In past 20 years the agents of disease, epidemiology and strategies of treatment for bacterial meningitis have changed very significantly. The organisms like *Streptococcus pneumoinae, Hemophilus influenzae* that were considered important isolates for CSF infections but are now rarely isolated from CSF samples in our setup. Etiological pattern is changing so there is a need of finding out current pattern of isolates and their antimicrobial profile from CSF samples. The changing etiological pattern and changing antimicrobial profile needs serious attention, so as to give proper care to our patients.[8] In order to provide useful information for developing strategies for preventing pathogens and enhancing evidence-based treatment, we thoroughly investigated antimicrobial resistance patterns and the common pathogenic bacteria of positive cerebrospinal fluid cultures in tertiary care hospital Rawalpindi city, Punjab province over a period of five years.

MATERIAL AND METHODS

This study was carried out at Department of Microbiology at Fauji Foundation Hospital(FFH) Rawalpindi, Pakistan. This was a descriptive cross sectional study. Ethical approval was taken prior to starting the study from Institutional Ethical FFH Review Board. All CSF samples received in microbiology Lab during the duration of study (Jan 2017-Dec 2021) were included in the study. All duplicate samples and samples of patients already on antibiotics were excluded from study. A total of 2000 CSF samples were received during the study. Out of these samples around 18 duplicate samples were excluded from study.

CSF routine examination was done on all samples. The received CSF samples were centrifuged at 2500 r/min in the laboratory of Microbiology. The supernatant fluid was discarded. The sediment was inoculated on blood agar, Chocolate agar and MacConkey's agar and were incubated at 37^0C for 24-72 hours aerobically and in 5 % CO2.

Cultures that yielded growth of any bacterial agent were further processed by standard microbiological methods of bacterial identification like Gram Stain, catalase test, Coagulase test, API 20E and API 20NE (Biomeurix). All the isolated pathogens were identified to the species level. All microorganisms were subjected to the antimicrobial sensitivity testing by modified Kirby Bauer Disc diffusion method on Muller Hinton agar (Oxoid). The isolates were incubated with antimicrobials discs for 18-24 hours at 37^0C. The applied antimicrobials discs along with their strengths were as follows: Amikacin 30µg, Ceftazaidime 30 ug, Ceftriaxone 30µg, Ciprofloxacin 5µg, Gentamycin 10µg, Imipenem 10µg, Linezolid 20µg, Meropenem 10µg, Penicillin 10µg. The results of the antimicrobial sensitivity were interpreted according to the Clinical Laboratory Standards Institute Criteria (CLSI 2021).[9] Dependent variables like frequency of bacterial meningitis causing bacteria, pattern of their antimicrobial resistance and Independent variables like socio demographic data of patients were calculated using the SPSS ver 21.

RESULTS

A total of 2000 CSF samples were received during the study period. From these samples only 157 samples yielded the growth of pathogens. Over the period of 5 years the culture positive ratio has increased significantly as depicted in the Fig 1.

Figure 1: Number of positive cases of CSF culture in five years.

The ratio of positive cases in female neuro surgery ward was much higher from rest of the wards/ departments of the Hospital.(Fig 2.)
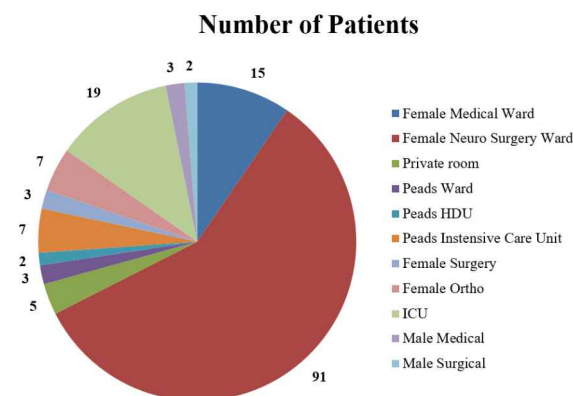

Figure 2: Number of positive cases from various wards.

Table I: Drug sensitivity Analysis of Gram Negative Pathogens isolated from CSF

Drugs	E.*Coli* (25%)	*Klebseila pneumoniae* (21%)	*Pseudomonas aeruginosa* (36%)	*Acinatobacter baumannii* (18%)
Amikacin30µg	28%	26%	53%	10.5%
Ceftazidime 30µg	-	-	69%	-
Ceftraiaxone 30µg	14%	-	14.7%	5.2%
Chloremphenicol 30µg	28%	-	-	15.7%
Ciprofloxicin 5µg	8%	17.3%	76.4%	26%
Gentamycin 10µg	24%	17.3%	61%	15.2%
Imepenem10µg	76%	74.7%	100%)	46%
Meropenen µg	74%	74.7%	98%	44%
Polymixin B 300µg*	40%	39%	28(82.3%)	28.5%
Sulzone µg	18%	-	19(55.8%)	-

*MICs were not done.

In cerebrospinal fluid culture positive specimens, *Pseudomonas aruginosa* was the most prevalent organism (36%) followed by *Escherichia coli* (25%) among Gram negative organisms. Among Gram organisms *Methicillin resistant Staphylococcus aureus (MRSA)* was the most frequently isolated. Patients under 25 years old had the majority of positive cultures. G-ve bacteria differ significantly by gender, age, and season; *Escherichia coli* was more prevalent in people under the age of 15 and *Pseudomonas* species were more prevalent in those under the age of 25. Summer season marked the highest percentage of positive cultures.

Table II: Drug sensitivity Analysis of Gram Positive Pathogens in CSF

Drugs	*MRSA* 52%	*Staphylococusaureus* 13%	*Enterococcusfaecalis* 35%
Chloramphenicol 30µg	50%	80%	56.25%
Ciprofloxacin 5µg	25%	60%	25%
Gentamicin 10µg	75%	60%	6.25%
Penicillin 10µg	-	60%	
Vancomycin 30µg*	100%	100%	90%
Cotrimoxazle 25µg	40%	60%	-
Lineziolid 20µg	80%	80%	62.5%
Meropenum 10µg	-	-	31.25%
Erythromycin 15µg	-	-	12.5%

*disk diffusion method

DISCUSSION

One of the most fatal illnesses is bacterial meningitis. Even while effective antimicrobials and immunizations have decreased incidence and improved patient care, the mortality rate can still reach 34% in developing countries like ours. Meningitis causes severe side effects like brain damage, hearing loss, long-term consequences like epilepsy, and mental instability etc. All these complications are more common if bacterial meningitis is acquired during early child hood. Despite the availability of many broad spectrum antibiotics there is high level of resistance in pathogens causing CSF infections. The mortality associated with these CSF infections ranges from 16-32%.[10-16] The incidence of these infections after surgery i.e 8% still remains very high in developing world. The frequency of CSF culture positivity was constantly high in our setup. It is necessary to analyze the epidemiology and drug resistance of CSF microbial infection.[17] Despite improvements in the epidemiology of bacteremia in this population, the prevalence of group B Streptococcus remains the principal cause of meningitis.[18] In 90% of cases of meningitis, bacteria have been found to be the cause, 86% of cases were brought on by *H. influenzae*, 75% by *N. meningitidis*, and 50% by Gram-negative bacilli.[19] Due to misuse of antibiotics in our country we analyze that the documented pathogens which were present in positive cultures of our setup were not seen in our hospital. On the other hand the resistant pattern of antibiotics in our setup were little different from our neighboring countries as indicated by studies come out from India and Iran[20] Our study identified *Pseudomonas aeruginosa*, as the most prevalent microorganism and it was identified in 36% of culture in this study. *Klebsiella pneumoniae* is also seen very commonly isolated from CSF samples in patients with critical medical conditions, leading to high mortality rates (33-48%).[21-22] Timely detection of such pathogens and having a consideration for them in empirical therapy may improve critical outcomes.[23] More than half of the patients in the current study have a long duration of illness and empirical antibiotic treatment before hospital presentation, resulting in a poor outcome of patients with bacterial meningitis which depends on a timely selection of appropriate antibiotics. This result was different from studies conducted in Ethiopia, Denmark and review study from which showed a positive relation of short duration illness and timely selection of antibiotics. This difference might be the difference in the use of standard guidelines for clinical presentation and lack of culture for etiologic identification and antibiotics susceptibility testing at all levels. The main issue in Klebsiella isolates is the emerging resistance against beta lactams and even carbapanems.[24] A meta-analysis study carried out in Pakistan revealed that pathogenic E.coli and Klebsiella species isolated from CSF samples and other important samples are highly resistant organisms and they were resistant to Penicillins 100%, ampicillin 91%, amoxicillin 85%, cefotaxime 82% and cefaclor 100%.[25] We found MRSA and *S. aureus* to be highly resistant to most of antibiotics. Similarly, in various reports from Pakistan reveal high resistance of *Staphylococcus aureus* to Penicillins (98%), Cefoxitin and other antimicrobials.[24] Therefore, evidence-based management of bacterial meningitis by using culture and antimicrobial susceptibility tests should be strengthened before empirical treatment. Moreover, all the bacterial isolates in this study had decreased susceptibility to the routinely prescribed drugs like ciprofloxacin and ceftriaxone. And further study with a better design, large sample size and survey of antimicrobial susceptibility at large scale should be done to draw important information.

The high resistance level was due to easy availability of antimicrobials, self-medications and taking incomplete dosage of antimicrobials.[25]

CONCLUSIONS

Pseudomonas aeruginosa was the most frequent organism isolated from CSF of patients of meningitis followed by MRSA.

RECOMMENDATIONS

In our country, additional studies are recommended for enhancing the surveillance and timely reporting of antibiotic resistance.

LIMITATIONS

Our research has potential limits. This hospital is for retired military person's families and their children. So the ratio of female and children patients was higher than men.

Conflict of interest: The authors declared no conflict of interest.

Authors' contributions:

Muhammad Moaaz Ali: Conception of study / Designing / Planning, Experimentation / Study Conduction, Analysis / Interpretation / Discussion, Manuscript Writing, Material Analysis

Umme Farwa: Analysis / Interpretation / Discussion, Manuscript Writing, Critical Review

Haider Ali: Analysis / Interpretation / Discussion, Material Analysis

Saima Ishtiaq: Experimentation / Study Conduction, Analysis / Interpretation / Discussion, Critical Review, Material Analysis

Saima Syed: Experimentation / Study Conduction, Analysis / Interpretation / Discussion, Critical Review, Material Analysis

Samina Javed: Analysis / Interpretation / Discussion, Critical Review, Material Analysis

Shahid Ahmed Abbasi: Conception of study / Designing / Planning, Analysis / Interpretation / Discussion, Critical Review

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