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ACKNOWLEDGEMENT

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TABLE OF CONTENTS

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Biosensors Precision in Healthcare: A Scientific Odyssey

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Biosensors have been the beacon of precision in the ever-evolving landscape of health care and offer a profound impact on diagnostics and patient care. These devices are designed to detect specific biological markers and convert then into measurable signals, seamlessly blending biology with cutting-edge technology. The diverse tapestry of biosensors encompass enzyme based sensors, immuno-assays, photo-biosensors, tissue-based sensors, DNA biosensors and nano-biosensors. Enzyme-based biosensors showcase unparalleled catalytic precision exemplified by glucose biosensors. Glucose oxidase serves as the biological catalyst and converts glucose into gluconic acid and hydrogen peroxide. Electrodes of the sensor then transduce this reaction into measurable signals which enables the precise quantification of glucose levels in diabetes management. Similarly, immunoassays rely on the specificity of antigen-antibody interactions. Most widely used immunoassay, Enzyme-linked immunosorbent assay (ELISA) exemplify this category, which finds applications in a number of diagnostics and provide a window into immunological responses and diseases such as HIV. Advancing the field of biosensing are the photobiosensors which utilize diverse technologies such as fluorescence resonance energy transfer (FRET) to illuminate biological processes. Genetically encoded biosensors that employ proteins like green fluorescent protein (GFP), enable non-invasive monitoring of cellular dynamics and offer real-time insights. Another cateogory, tissue-based biosensors converge the technology with the physiological environments. For instance, implantable glucose sensors that continuously monitor blood glucose concentrations and provide real-time data for personalized treatment approaches. At the core of precision diagnostics lie DNA biosensors such as DNA microarrays. They offer parallel analysis of gen expression, influencing decisions in cancer diagnostics and pharmacogenomics. Nanobiosensors, represented by nanoparticle-based sensors, navigate the nano-frontiers with exceptional sensitivity. For example, quantum dots exhibit unique optical properties for sensitive detection. Likewise, gold nanoparticles based biosensors enable real-time monitoring of drug release in drug delivery systems and emphasize their role in precision medicine. As biosensors advance, ethical considerations come to the forefront. Issues such as data privacy, consent, and equitable access to these technologies demand careful attention. It becomes imperative to ensure that biosensors are developed and deployed responsibly with a keen awareness of potential societal implications in navigating the ethical landscape. In the symphony of precision that biosensors bring to healthcare, their types and applications reflect not only technological prowess but also the ethical responsibility inherent in their development and deployment. As these devices continue to evolve, the healthcare landscape stands on the brink of a new era, where precision and ethics intertwine for the betterment of patient outcomes.

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Original Article

Assessment of Class Room Anxiety Among Nursing Students at Private Nursing Institute, Karachi, Pakistan

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ABSTRACT

Class room anxiety, stemming from academic pressure and fear of evaluation, impacts students' well-being and academic performance, underscoring the necessity for supportive learning environments. **Objective:** To assess the Class room anxiety level among nursing students. **Methods:** This cross-sectional study was undertaken at a private nursing institute in Karachi, Pakistan, from November 2023 to January 2024. Utilizing a convenient sampling technique, the study comprised one hundred twenty student participants. **Results:** The study's demographics reveal that 91.7% (n=120) of participants are aged 18-24, with a male majority of 83.3% (n=100). In terms of education year, 26.7% (n=32) are in the first year, 37.5% (n=45) in the third year, and 30.8% (n=37) in the fourth year. Regarding Class room anxiety, 7.5% (n=8) exhibited normal levels, 26.7% (n=32) showed mild to moderate anxiety, 55.0% (n=66) experienced severe anxiety, and 10.8% (n=13) reported extreme anxiety. **Conclusions:** This underscores the urgent need for targeted interventions in educational settings and emphasizes the ongoing importance of researching contributing factors for effective strategies to promote a healthier learning experience.

INTRODUCTION

University is a significant part of life, and in today's education system, tests and evaluations play a significant role in deciding what career path a student might take in the future [1]. Anxiety is formally described as an unfavorable emotional state encompassing an individual's perceived feelings of tension, apprehension, and nervousness, coupled with the activation of the autonomic nervous system [2, 3]. Anxiety represents an emotionally adaptive reaction to situations that are uncertain or alarming, priming individuals to take action and respond appropriately [4]. The literature extensively addresses anxiety among nursing students in diverse clinical placements, recognizing its potential impact on learning and performance [5]. Clinical placement is the physical setting and personnel teaching for healthcare workers, including nurses and nursing students [6, 7]. In regular circumstances, nursing students have indicated experiencing anxiety from multiple origins, including the intricate design of nursing courses, apprehension about exam outcomes, perceived deficiency in faculty support, and sometimes clinical teacher [8]. Nursing students develop their nursing skills by participating in activities that involve observing, imitating, ongoing assessment, exploration, hands-on practice, and reflective processes [9]. Nursing students, like others, experience significant pressure to meet academic and practical requirements,

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heightened by the belief that even minor mistakes could have serious consequences for patients and their careers, with instructors noting heightened test anxiety compared to other fields [10]. Anxiety and perceived stress levels are anticipated based on workload, student behavior, and employment conditions, with the most substantial factor contributing to heightened anxiety being the considerable absence of administrative support [11]. Although anxiety can be beneficial in specific tasks, it has the potential to hinder the learning process. As a rule, nursing students commonly experience stress and anxiety throughout their education and training [12]. Teaching nursing skills through distance education has been observed to induce significant anxiety in the majority of students [13]. Labrague emphasizes the negative impact of unaddressed stress and anxiety on nursing students' emotional well-being, leading to a concentrated effort over the past two decades to devise psychological interventions for stress reduction during clinical practice [14]. A recent multicenter study in Spain involving 28,559 students from 16 universities revealed that 20.84% experienced substantial anxiety during exams, requiring specialized assistance. Additionally, research on healthcare degree program students indicates a higher prevalence of pre-exam anxiety, ranging from 30% to 50%, compared to other university degrees [15].

Recognizing the importance of understanding and addressing this phenomenon within the educational context. As nursing students navigate rigorous academic and practical demands, the investigation seeks to provide insights into the prevalence, sources, and impact of class room anxiety. This study is driven by the rationale that a comprehensive understanding of such anxiety is crucial for developing targeted interventions and support systems, ultimately enhancing nursing students' overall learning experience and well-being as they progress through their education and training.

METHODS

A descriptive cross-sectional study assessed class room anxiety among 1st, 2nd, 3rd and 4th year nursing students. A current study was conducted in a private nursing school. The chosen school was Horizon School of Nursing and Health Sciences in Karachi, Pakistan. The target population was a bachelor of science in nursing students. 1st, 2nd, 3rd and 4th year, male and female and 18 years and above students were included. The participants who were diplomatic nursing students and below 18 years old were excluded from the study. The sample size was calculated through open Epi with a 95% confidence interval. The calculated sample size was 132, but 13 students did not complete the questionnaire, so the data were analyzed for 120 students. We used convenience sampling for this study to pick participants from the selected study setting. The study lasted from November 01, 2023, to January 10, 2024. We got permission to collect data from the authorized organization, and participants agreed to take part. The researchers explained the study's reasons, goals, methods, and importance to the participants both in writing and verbally. After that, participants filled out the questionnaire online. Approval was taken from the Horizon School of Nursing with reference number (SHNHS/2023/501) to gather data. Each participant was asked to sign an informed consent form. The researchers are dedicated in maintaining the anonymity and confidentiality of participants, and no one was obligated to participate. The study employs an instrument designed to measure class room anxiety, inspired by Richmond's Situational Communication Apprehension Measure, with an expected alpha reliability of around 0.90. They were instructed to swiftly circle their initial impressions, using a 5-point scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (5). Specifically, bold questions were recorded in reverse, and the cumulative class room anxiety score was derived by adding the scores for each item. This composite score ranged from 20 to 100. 20-44 indicated a normal range of anxiety, a score of 45-59 indicated mild to moderate anxiety levels, a score of 60-74 indicated marked to severe anxiety levels, and a score of 75 and above indicated extreme anxiety levels. SPSS version 26.0 was employed for data analysis, and demographic data were calculated using frequency percentages.

RESULTS

Table 1 shows the results of demographic variables, including age, gender, and year of education of the study participants. Among the participants, 91.7% (n=110) fell within the 18-24 age range. Most participants in terms of gender were male, constituting 83.3% (n=100). Regarding the year of education, 26.7% (n=32) of participants were in their first year, 37.5% (n=45) in the third year, and 30.8% (n=37) were in the fourth year.

Table 1: Demographic Characteristics n=120

Variables		Frequency (%)
Age	18-24	110 (91.7%)
	25-30	10 (8.3%)
Gender	Male	100 (83.3%)
	Female	20 (16.7%)
Year of Education	1st year	32 (26.7%)
	2nd year	6 (5.0%)
	3rd year	45 (37.5%)
	4th year	37 (30.8%)

Table 2 displays the levels of class room anxiety. Specifically, 7.5% (n=8) of participants exhibited a normal range of anxiety, 26.7% (n=32) showed mild to moderate anxiety levels, 55.0% (n=66) experienced severe anxiety, and 10.8% (n=13) reported extreme anxiety levels.

Table 2: Level of Class Room Anxiety

Level of class room anxiety	Frequency (%)
Normal range of anxiety	9 (7.5%)
Mild to moderate anxiety	32 (26.7%)
Severe anxiety levels	66 (55.0%)
Extreme anxiety levels	13 (10.8%)

DISCUSSION

Class room anxiety, from academic pressure and the fear of evaluation, influences students' well-being and academic performance, emphasizing the critical requirement for learning environments that offer support [16]. The current study with 120 participants showed a predominant age group of 18-24 (91.7%), a substantial male majority (83.3%), and 37.5% in the 3rd year of education, while the second study with 221 participants featured a different demographic profile, including 37% aged 18-20, 84.6% females, and a majority (52%) from the junior class [17]. Comparing Class room anxiety levels, the present study showed 7.6% normal, 26.7% mild to moderate, and 55% severe anxiety, while another study indicated 11% normal, 69% moderate, and 21% severe anxiety [18]. In a different study involving university students, it was found that 21.9% displayed moderate anxiety symptoms, 6.3% reported severe anxiety, and 2.3% indicated extremely severe anxiety symptoms [19]. Other results have showed that, during their clinical rotation, 32.3% of students reported mild to moderate anxiety, whereas 67.7% of students reported normal levels of anxiety [20]. A different survey discovered that 41.3% of individuals reported mild anxiety, 40.0% had moderate anxiety, and 18.8% had high anxiety [21]. In a separate study, students faced language-related anxiety in the Class room, with 55% highlighting speaking in a second language as a significant concern, accompanied by worries about grammatical errors, pronunciation, and the ability to respond promptly [22]. The findings of this study are crucial for two main reasons. First, in the realm of nursing education, there is currently a lack of a brief instrument for the convenient measurement of state and trait anxiety accessible to nurse educators and researchers [2]. In our research study, it is vital to highlight that the current study identified a predominant occurrence of severe anxiety levels among participants. In contrast, a different study indicated that most participants exhibited normal anxiety levels [23]. The present study revealed that the majority of participants, 55%, experienced mild to moderate levels of anxiety. Similarly, another study conducted in Pakistan also demonstrated comparable results, with 50.9% reporting an average anxiety level [24].

CONCLUSIONS

Notably, 55% reported experiencing severe anxiety, and 10.8% indicated extreme anxiety levels. These findings underscore the pressing need for targeted interventions to address elevated anxiety in educational environments.

Authors Contribution

Conceptualization: HN
Methodology: HN, AB
Formal analysis: HN
Writing-review and editing: HN, F, FA, MY, IN, SZ, AB

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

Explore the Association of Anger with Academic Year Among Nursing Students at Private Nursing Institute Karachi Pakistan

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ABSTRACT

Anger among nursing students can stem from various sources, considering the demanding nature of their education and future profession. **Objective:** To explore the association of anger with academic year among nursing students at a private nursing institute in Karachi, Pakistan. **Methods:** This cross-sectional study was conducted at Horizon School of Nursing and Health Sciences: 153 nursing students were recruited through convenient sampling. Nursing students enrolled in various academic years were included. **Results:** The study findings revealed that the participants are predominantly male, making up 85.6% of the sample, while females represent 14.4%. Moreover, the findings revealed that the mean anger score is calculated at 28.8366, indicating the average level of anger reported by nursing students. The findings also include p-values, highlighting significant differences in academic years ($p = 0.016$) but not in gender ($p = 0.156$) or age groups ($p = 0.440$). The study found average anger levels among nursing students (28.8366). Academic years showed significant differences in anger ($p = 0.016$), while gender ($p = 0.156$) and age ($p = 0.440$) did not. **Conclusions:** Tailored support for specific program stages could enhance student well-being.

INTRODUCTION

Anger is a normal emotion that arises from environmental stress and is associated with irritation over one's wants or perceived threat. It is an adaptive, subjective emotion ranging from mild annoyance or upset to furious outbursts [1]. Moreover, it is divided into aspects that are experienced and expressed. Anger expression is the behavioral area in which a person expresses their anger, whereas anger experience is the emotional state that a person experiences along with physiological reactions. State and trait anger are standard components of the anger experience. State rage is the instantaneous, unpleasant, and variable-intensity subjective response to an environment that elicits anger. An essential idea in determining an individual's baseline level of anger is trait anger, which is a comparatively constant and steady emotion independent of particular circumstances or timing [2]. While anger control is seen as a regulated, adaptive strategy of anger resolution, anger suppression and expression-out are thought to be uncontrollable, maladaptive forms of expressing anger. Anger management gone wrong has detrimental effects on one's physical well-being, such as a rise in the incidence of cardiovascular illnesses and a rise in eating disorders-related body mass index [3, 4]. Adolescent anger is a

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significant topic because of the detrimental psychological and physiological impacts it can have. Anger has detrimental impacts on overall health and presents psychosomatically as a range of symptoms, including headaches, nausea, upset stomachs, trouble rising out of bed in the morning, and complaints of aches and pains [5]. Based on these findings, it is advised that a program be developed to help nurses express their anger to help them deal with their suppressed emotions and prevent interpersonal conflicts [6]. Research revealed a link between high levels of anger and drug, alcohol, and cigarette addiction [7]. Another survey shows that long duty hours lead to anger [8]. It also results in psychological issues, including low self-esteem or interpersonal conflicts. Therefore, preserving one's physical and emotional well-being requires effective anger management [2]. It has been stated that approximately 18% of South Korean nurses encounter state anger at work [9]. One of the feelings that nurses experience regularly is anger. Interpersonal disputes brought on by a lack of communication, unfair treatment, and disrespect are some of the things that might make someone angry. The workload of nurses was another source of rage. For instance, a study of hospital nurses revealed that having a lot on your plate often angers you [10]. Nursing students and nurses can provide better patient care if they manage their negative emotions, such as rage, and maintain a good mental state. Additionally, because nursing students must shoulder the obligations of future healthcare workers, their negative emotions are more potent than those of college students [11]. This emotional state could become angry or dissatisfied, resulting in poorer nursing practice and care. Nursing education and practice can be highly stressful due to the demanding nature of the profession. Students may face challenges in clinical placement, like long hours, academic pressure, and emotional stress while caring for patients [12].

This environment could potentially contribute to increased anger levels. Therefore, understanding the anger levels of nursing students is crucial.

METHODS

This cross-sectional study was conducted at Horizon School of Nursing and Health Sciences from September to December 2023. One hundred fifty three nursing students were recruited through convenient sampling. Nursing students enrolled in various academic years were included. Consent was obtained from participants before their involvement. Sample size was calculated through open Epi with a 95% confidence interval. Collect relevant demographic information such as age, gender, academic year, and any prior experience in healthcare. A structured instrument called the Level of Anger Scale (LAS) was created to gauge youths' levels of anger. Respondents are asked to score how frequently they experience various anger-related symptoms, such as feeling irritable, becoming angry quickly, and having difficulties managing their temper, on a 13-item measure. A 5-point rating system is used to rank the items, ranging from 'never' to 'very often' [5]. Prior ethical approval was obtained from the relevant institute with reference number SHNHS/2023/467 and date of November 24, 2023. Anonymity and confidentiality of participants' responses was ensured. Informed consent was obtained from all participants before data collection. Statistical analysis software SPSS26 was used for data analysis. Frequency and percentage were used for the demographic data, mean, and standard deviation were used for the anger level score. Moreover, the independent t-test was used to associate gender with anger score, and one-way ANOVA was used to associate academic year and age with anger score.

RESULTS

Table 1 presents demographic data gathered from 153 participants across several categories. Regarding age distribution, most participants fall within the 23-25 age range, comprising 54.9% of the total. A significant portion, 37.3%, are between 19 and 22 years old, while a smaller fraction, 7.8%, are above 25 years old. Gender-wise, the participants are predominantly male, making up 85.6% of the sample, while females represent 14.4%. Regarding the academic year, the largest group consists of students in their 3rd year, comprising 39.9% of the participants. Following closely, the 4th-year students make up 35.9%, with smaller percentages from the 2nd year (20.9%) and the 1st year (3.3%).

Table 1: Demographic data of the participants (N = 153).

Variables	Frequency (%)
Age (years)	
19-22	57 (37.3)
23-25	84 (54.9)
above 25	12 (7.8)
Gender	
Male	131 (85.6)
Female	22 (14.4)
Academic year	
1st year	5 (3.3)
2nd year	32 (20.9)
3rd year	61 (39.9)
4th year	55 (35.9)

Table 2 provides statistical information regarding the mean and standard deviation of anger levels among nursing students. The mean anger score is calculated at 28.8366, and the standard deviation is 9.82910, with a total score of 65.

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Table 2: Mean and standard deviation of anger among nursing students.

Mean ± SD	Total Score
28.8366 ± 9.82910	65

Table 3 shows the association of demographic variables with anger score. Looking at gender, females show a higher average score (30.68) compared to males (28.53). Regarding age groups, those between 19-22 and 23-25 years old have relatively similar mean scores of 29.16 and 29.12, respectively, while individuals above 25 have a slightly lower score of 25.33. Academic year-wise, 1st and 4th-year students exhibit similar high average scores of 31, contrasting with 2nd-year students, who show a lower average of 24.19. 3rd-year students fall in the middle with an average score of 29.15. The table also includes p-values, highlighting significant differences in academic years (p = 0.016) but not in gender (p = 0.156) or age groups (p = 0.440).

Table 3: Association of demographic variables with anger score.

Variables	N	Mean ± SD	p – value
Gender			
Male	131	28.5267 ± 10.06160	0.156
Female	22	28.5267 ± 10.06160	
Age			
19-22	57	29.1579 ± 9.09040	0.440
23-25	84	29.1190 ± 10.11191	
above 25	12	25.3333 ± 11.32442	
Academic Year			
1st year	5	31.0000 ± 6.04152	0.016
2nd year	32	24.1875 ± 10.81050	
3rd year	61	29.1475 ± 8.19926	
4th year	55	31.0000 ± 10.45626	

DISCUSSION

Anger is a common and natural emotion that arises in diverse situations based on interactions with the surroundings, playing a vital role in maintaining human relationships [13]. The study includes 153 predominantly male participants (85.6%), with the most significant portion of students (39.9%) in the third-year class. In another study by Ansar F et al., incorporating with 400 participants, 43.3% were recorded as female, and most were in their final year (36.7%) [14]. Another study was conducted in Turkey in 2020 by Korkmaz E.K et al., to explore the association of anger with age, revealing a mean and standard deviation of 30.8 ± 7.3 (18–59). However, no significant relationship was found among participants about age [15]. The current study's findings demonstrated that participants' average level of anger is 28.8366, which is the mean anger score. Similarly, Hamdan-Mansour A.M et al., showed that the mean state anger score was 31.7, suggesting a moderate level of state anger in students [16]. Additionally, another study was conducted in Korea by Campano J.P. et al., in 2021, and its mean and standard deviation were 2.20 (SD = 0.51) and 2.44 (SD = 0.38), respectively. In this regard, another study also found an average level of anger among the participants [17]. Today, anger and violence among students are serious concerns. Pupils who struggle with cognitive processing and have high levels of anger are more likely to experience relationship difficulties, academic underachievement, and health issues [18]. The current study found a non-significant association (p = 0.156) between gender and anger. In contrast, another study reported by Tanabe Y et al., a significant association (p = .016), indicating potential variations in gender-related patterns across research contexts [19]. In contrast, in another study conducted by Mohamed Moustafa M et al., it has been found that males have higher anger than females. Also, that males have higher anger compared to females. In the present study, the association between age and anger has a mean of 10.17, while another study reports a higher association of 19.86 for the same demographic characteristic [20]. The present study identified a non-significant association (p = 0.156) between gender and anger. In comparison, another study in Pakistan by Naveed H et al., reported a p-value of 0.124 concerning the association of anger with gender [21]. The present study indicates a significant association with the academic year (p=0.016), while another study done by Cha N.H. et al., suggests a distinct connection with anger (p=0.004) across academic years [12]. The present study highlights a significant association with the academic year (mean = 28.83 ± 8.87). In contrast, a study conducted in Turkey in 2022 by Girgin B.A reports the different values (mean = 59.27 ± 11.07) [22]. Students in their second year may be in a transitional stage, going from primary education to more applied, hands-on experiences. This change can be difficult, and the adjustment needed may exacerbate emotions of rage.

CONCLUSIONS

The study on anger levels among nursing students revealed an average anger score of 28.8366. Significant variations were found based on academic years (p = 0.016), indicating differing anger levels across the program's stages. However, gender (p = 0.156) and age groups (p = 0.440) did not demonstrate substantial differences in reported anger.

Authors Contribution

Conceptualization: AB
Methodology: FK, AB,
Formal analysis: MI, HAR, AB
Writing-review and editing: HA, SM, AB

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 Burnout and its Factors among Nurses Working at Tertiary Care Hospital Lahore

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ABSTRACT

Nurses experience a high rate of burnout, which may be attributed to the physically and mentally exhausting profession. Consequently, it leads to a decrease in the quality of care. **Objectives:** The present study was employed to determine the frequency of burnout and its contributing factors among nurses. **Methods:** A cross-sectional study was conducted at the Mayo Hospital, Lahore. Both male and female nurses and at least one year of job experience were included in the study. Nurses who were working in management posts were excluded from the study. A self-administered, pre-tested, and validated questionnaire "Copenhagen Burnout Inventory" was used to assess burnout. **Results:** Most of the nurses reported moderate levels of personal, professional, and client-related burnout. Gender was significantly and negatively associated with emotional burnout (β -.182; p=0.004), and rotation of duty was also found to be significantly and negatively related to personal burnout (β -0.271; p<0.01) among nurses. Similarly, work-related burnout, gender (β -0.198; p=0.002), and rotation (β -0.175 p=0.006) were found to be negatively and significantly associated with burnout, while duty shift was significantly positively (β=0.169; p=0.010) related to work-related burnout. Age was positively associated (β=0.096; p=0.029) with client-related burnout, while residence (β -0.17; p=0.022, and rotation (β -0.617; p=0.004) were found to be negatively and significantly associated with client-related burnout. **Conclusions:** A high frequency of burnout was recorded among study participants. The long duty shifts and rotations had a significant impact on nurses' burnout in the present study.

INTRODUCTION

Nurses are considered as the backbone and frontline healthcare workers of the healthcare system. Nurses are more prone to develop burnout due to direct contact with patients than other healthcare professionals [1]. Burnout is a feeling of physical and emotional exhaustion, helplessness, and depression with a negative attitude toward others [2]. It is established by current research that Intensive Care Unit (ICU) nurses experience life-threatening situations, shortage of proper personal protective equipment, the fear of being ill and making others sick, and family access limitations. These challenges expose nurses to profound psychological concerns [3]. In addition, a lack of family support and financial crisis can negatively impact the work productivity of the nurses. Inconducive working environment and lack of family support are vital for causing burnout among nurses [4]. Burnout affects 59.1% of clinical nurses, and social, environmental, and personal factors may increase the severity of burnout [5]. It is demonstrated anxiety and depression is associated with 77.1% and 84% respectively [6]. Copenhagen Burnout Inventory (CBI) is a tool that measures burnout in three dimensions, including personal burnout, work-related burnout, and client-related burnout in hospital settings [7]. A recent research study found that personal burnout affects 44.6% of healthcare professionals, work-related burnout affects 26.9%, and

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pandemic-related burnout affects 52.8% [8]. Nurses, as frontline healthcare workers, particularly during the time of COVID-19, might have had moral stress regarding their work ethics, sense of responsibility, and obligation. They feel more worried about contracting an infection. Nurses have considerable responsibilities of having close contact with patients, a higher risk of infection, and a twofold increase in physical or mental stress. A study conducted in Hubei Province in China found that 92.68% of nurses have psychological difficulties after two weeks of COVID-19 [9]. The prevalence of burnout syndrome is rising dramatically across the globe. It is possible to acknowledge burnout syndrome as an occupational disease that exists in 39% of countries [10]. Burnout can harm the quality of care rendered by the nurses [11]. Burnout has a detrimental impact on the quality of nursing care and raises the rate at which nurses leave this profession. According to a World Health Organization assessment from 2006, a nurse shortage will hinder national and international efforts to improve the world population's health and well-being [12]. Therefore, this study aimed to determine the frequency of burnout and contributing factors of burnout among nurses working in a public sector hospital in Lahore.

METHODS

This cross-sectional study was carried out at Mayo Hospital, Lahore for periods of three months from July 2021 to September 2021. The calculated sample size was 246. It was calculated with OpenEpi version 3.01 online sample size calculator by taking 80% prevalence of burnout [13]. Nurses were recruited through a non-probability consecutive sampling technique. Charge nurses of both genders, working at the bedside and having at least one year of job experience were included in the study. While, nurses who were working management positions and contractual job holders were excluded from the study. Before data collection, study protocols were approved by the Graduate Nursing Review Committee (GNRC) at Ziauddin University Faculty of Nursing and Midwifery, Karachi. Moreover, approval for data collection was also granted by the Medical Superintendent of the hospital vide letter No.ND/14452/MH dated October 13, 2021. After that, written informed consent was obtained from all participants for their voluntary participation. The questionnaire was explicitly explained to all subjects and the confidentiality of the data was assured. The Copenhagen Burnout Inventory Scale was used to collect the data. It is accessible online for researchers and in the public domain. CBI comprises 19 questions about burnout including personal, work-related, job satisfaction, health status perception, and intention to leave a job. Questions from one to six were about personal burnout, seven to thirteen were about work-related burnout and questions from fourteen to nineteen measured burnout related to clients [7]. Responses were made on a five-point Likert scale ranging from 1 (never) to 5 (always). The total score in this burnout tool of burnout is 95. Less than a 25% score was considered as no burnout. Above a 25% score means burnout is present. If it exists, then burnout status was categorized as mild, moderate, and severe burnout based on scores. The score ranges from 25-50% was considered mild, 50-75% moderate, and >75% was counted as severe burnout. The data were entered and analyzed on Statistical Package for Social Sciences version 22.0. The descriptive analysis was computed in frequency and percentages. The correlation analysis was performed to measure the relation of various parameters such as age, gender, marital status, residence, duty shift, rotation, job experience, and education status with burnout. P-value ≤0.05 was considered as a level of significant.

RESULTS

In the current study, majority 232 (93.9%) of the participants were female nurses. Almost half 133 (53.8%) of the study subjects were married. 112 (45.3%) were working in morning shifts, 79 (32.0%) in the evening, and 56 (22.7%) did the night shift. 102 (41.3%) participants were aged between 23-28 years, 73 (26.9%) participants were of 29-32 years, 54 (21.9%) were in the age group of 33 to 37 years, and 18 (7.3%) were aged above 38 years. 108 (43.7%) participants were general nursing diploma holders, 49 (19.8%) completed Post RN BS Nursing. Almost one-fourth 190 (76.9%) participants had 2-7 years of work experience. Table 1 represents the frequency of personal burnout. The frequency of "Often" was highest, 103 (41.7%), against "Feel tired." The frequency of "Sometimes" was highest against "Physically exhausted" 121 (49.0%), "Emotionally exhausted" 153 (61.9%), "Fatigued" 107 (43.3%), and "I cannot take it anymore" 136 (55.1%). The response against "susceptibility to illness was found as Seldom 76 (30.8%) Sometimes, 71 (28.7%), and Often 76 (30.8%).

Table 1: Frequency of Personal Burnout

Questions	Never	Seldom	Sometimes	Often	Always
	Frequency (%)				
How often do you feel tired?	9 (3.6)	64 (25.9)	65 (26.3)	103 (41.7)	6 (2.4)
How often you are physically exhausted?	3 (1.2)	47 (19.0)	121 (49.0)	73 (29.6)	3 (1.2)
How often you are emotionally exhausted?	4 (1.6)	22 (8.9)	153 (61.9)	67 (27.1)	1 (0.4)
How often do you think: "I think I cannot take it anymore"?	7 (2.8)	38 (15.4)	136 (55.1)	65 (26.3)	1 (0.4)
How often do you feel fatigued?	3 (1.2)	50 (20.2)	107 (43.3)	84 (34.0)	3 (1.2)
How often do you feel weak and susceptible to illness?	10 (4.0)	76 (30.8)	71 (28.7)	76 (30.8)	14 (5.7)

Table 2 reveals the frequency of professional burnout. The frequency of "Sometimes" was highest against "feel worn out" 105 (42.5%), "exhausted in the morning" 125 (50.6%), "every working hour is tiring" 127 (51.4%), "enough energy for family and friends "122 (49.4%), "emotionally exhausting" 99 (40.1%), "work frustrates you" 113 (45.7%) and "feel burnt out because of your work" 120 (48.6%).

Table 2: Frequency of Professional Burnout

Questions	Never	Seldom	Sometimes	Often	Always
	Frequency (%)				
Do you feel worn out at the end of the working day?	3 (1.2)	59 (23.9)	105 (42.5)	76 (30.8)	4 (1.6)
Are you exhausted in the morning at the thought of another day at work?	9 (3.6)	35 (14.2)	125 (50.6)	77 (31.2)	1 (0.4)
Is every working hour tiring for you?	8 (3.2)	36 (14.6)	127 (51.4)	72 (29.1)	4 (1.6)
Do you have enough energy for your family and friends during leisure time?	3 (1.2)	45 (18.2)	122 (49.4)	71 (28.7)	6 (2.4)
Is your work emotionally exhausting?	8 (3.2)	57 (23.1)	99 (40.1)	79 (32.0)	4 (1.6)
Does your work frustrate you?	9 (3.6)	53 (21.5)	113 (45.7)	68 (27.5)	4 (1.6)
Do you feel burnt out because of your work?	7 (2.8)	54 (21.9)	120 (48.6)	61 (24.7)	5 (2.0)

Table 3 exhibits the frequency of frequency of client-related burnout. The assessment of client-related burnout through the frequency of never, seldom, sometimes, often, and always indicates that the frequency of "Sometimes" was highest against "find hard to work with clients" 113 (45.7%), "drain energy to work with clients" 122 (49.4%), "frustrating" 119 (48.2%), "feel that you give more than you get back" 102 (41.3%), "tired of working" 168 (68.0%) and "wonder how long you will be able to continue" 153 (61.9%).

Table 3: Frequency of Client-related Burnout

Questions	Never	Seldom	Sometimes	Often	Always
	Frequency (%)				
Do you need help to work with clients?	5 (2.0)	49 (19.8)	113 (45.7)	73 (29.6)	7 (2.8)
Does it drain your energy to work with clients?	5 (2.0)	39 (15.8)	122 (49.4)	80 (32.4)	1 (0.4)
Do you find it frustrating to work with clients?	9 (3.6)	34 (13.8)	119 (48.2)	81 (32.8)	4 (1.6)
Do you feel you give more than you get back when working with clients?	5 (2.0)	52 (21.1)	102 (41.3)	86 (34.8)	2 (0.8)
Are you tired of working with clients?	5 (2.0)	21 (8.5)	168 (68.0)	52 (21.1)	1 (0.4)
How long will you be able to continue working with clients?	4 (1.6)	29 (11.7)	153 (61.9)	58 (23.5)	3 (1.2)

Table 4 discloses the association of demographic variables with burnout among nurses. It was found that gender was significantly and negatively associated with emotional burnout, and rotation of duty was also significantly (p-value=0.004) and negatively (β -.182) related to personal burnout among nurses. Similarly, for work-related burnout, gender and rotation were found to be negatively (β -.198, (β -.175) and significantly (p-value=0.002, and p-value=0.006) associated with burnout, while duty shift was significantly positively related to work-related burnout. Age, residence, and rotation were positively and significantly associated with client-related burnout.

Table 4: Association of demographic variables with burnout among nurses

Parameters	Personal Burnout		Work-Related Burnout		Client-Related Burnout	
	β	P-Value	β	P-Value	β	P-Value
Age	-.051	.549	.038	.662	.096	.029
Gender	-.182	.004	-.198	.002	-.148	.252
Marital Status	-.048	.558	-.047	.571	.000	.995
Residence	.092	.220	-.104	.173	-.174	.022
Duty Shift	.084	.195	.169	.010	.009	.814
Rotation	-.271	<0.01	-.175	.006	-.617	.004
Job experience	.090	.243	.023	.773	-.027	.682
Education status	-.089	.165	-.054	.400	-.035	.138

β= standardized coefficient, p-value ≤0.05 level is considered significant.

DISCUSSION

In the current study, it was found most of the nurses were reported moderate level of personal, professional, and client-related burnout since the study participants responded "sometimes" against each question specific for emotional burnout, professional and client-related burnout. These findings are consistent with the previous reports in which a moderate level of burnout was observed among nurses working in the ICU ward . Similar findings were also observed by Butera *et al* [14]. This study found that nurses in intensive care units and emergency departments were at risk of burnout. With the addition of pandemic situations, this study also revealed nurses' experience during the coronavirus disease 2019 pandemic was quite different and increased the risk of burnout. The present study found a moderate level of personal, professional, or client-related burnout among nurses. Burnout in healthcare workers is multifactorial and has been presented as the basis of harmful effects during pandemics. During the first pandemic of the century, SARS, a questionnaire-based assessment of employees working in the emergency department shown considerably high levels of concern among nursing staff, doctors, and healthcare assistants [15]. The anxiety of infection due to the contagious nature of the disease, worry for self and family, job stress, interpersonal isolation, perceived stigma, fear of undertaking foreign labor, and other variables have all been associated with psychological distress among HCWs working in pandemics [16]. The pandemic's impact can also be enduring. Maunder *et al.*, investigated the long-term psychological consequences of the SARS outbreak in Canadian healthcare workers after 1–2 years. The nurses in Canada reported substantially greater burnout, psychological distress scores, and posttraumatic stress scores than their colleagues who did not care for SARS patients [16]. A previous study showed some associated factors with nurse burnout. These factors

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included gender, age, marital status, timings/shifts, healthcare designation, administrative tasks, and healthcare service areas [17]. The present study observed that gender and rotation were significantly and negatively associated with personal and work-related burnout. The negative association of gender with personal and work-related burnout was not prominent, and it may be due to the discrepancy in the distribution of gender; most of the participants were female. Recent research have discovered a link between overwork in critical care and emergency services and a higher likelihood of burnout among nurses [18]. According to current research study findings conducted during the COVID-19 pandemic, the additional work during the pandemic led to increased burnout among nurses. The results of the present study are consistent with these reports and reveal that the rotation of duties may not lead to burnout. In contrast, rotation consistency may contribute to burnout among nurses [19, 20]. Age, residence, and rotation were positively and significantly associated with client-related burnout in the current study. Many situations may lead to nurse burnout, for example, being away from their homes and families continuously resulting in a sensation of helplessness to spend appropriate energy in family, a disturbance of circadian rhythms, and acute exhaustion [21]. A study among nurses in Lahore, Pakistan, found more incredible burnout and a worse quality of life among nurses working in gynecology and surgical departments, particularly those nurses who did longer shifts [21]. In the current study, the scenario of the study population was quite different. As they worked in the COVID ICU, their insecurity and helplessness increased while dealing with the patient during this pandemic. The current study found the association of burnout with years of job experience was insignificant. Contradictory findings were observed from a previous study in Karachi, Pakistan, in which a significant association of burnout with job experience was found and revealed by Ahmed *et al.*, that a moderate level of burnout was seen as higher in participants who had professional experience of 3-5 and 6-10 years [22]. Furthermore, those with more than ten years of work experience were shown to have a higher level of burnout. A previous study found that more incredible years of job experience lowered burnout levels among nurses. These nurses are also less likely than those with fewer years of experience to abandon their positions. However, it was exhibited that nurses with less work experience are less likely to adjust to the obstacles of their profession and, as a result, get irritated. Since the study participants were working during COVID, the working protocol and environment were new for each participant; therefore, there was an insignificant correlation between work experiences and burnout.

CONCLUSIONS

The study concluded that nurses were experienced moderate levels of personal, professional, and client-related burnout. It is, therefore, summarized that the COVID-19 epidemic affected burnout rates due to increasing demands on the workforce. Policies that promote optimal staffing ratios are the critical component of a holistic approach. To decrease or eliminate burnout among frontline nurses and strive toward happier clinicians, better health, better treatment, and lower costs.

Authors Contribution

Conceptualization: ZP
Methodology: R, B
Formal analysis: ZP, R
Writing, review and editing: R, B

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

Investigating the Satisfaction of Students within Public Sector and Private Sector Medical Colleges: An Empirical Evidence from Pakistan

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ABSTRACT

Medical education is a highly regarded career choice among the majority of students in Pakistan. A significant number of students enroll in medical colleges in Pakistan with the aim of serving humanity, obtaining social and financial advantages, and fulfilling their parents' desire to see them become doctors. In that respect the consideration of student satisfaction is important in relation to effectiveness within their performance as well. **Objective:** To analyze the satisfaction level for the students within the public and private sector medical colleges in Pakistan. **Methods:** he semi-structured interviews were selected for the current research. The interviews provided the expressive possibility towards collecting efficient data in from of opinions and experiences from 5 medical students enrolled in the public sector medical colleges and 5 medical students from private sector medical colleges in Pakistan. **Results:** The research highlighted that on the main consideration there were different types of issues which are influencing the satisfaction of students within different considerations and backgrounds from the medical sector. The teacher perception, way of teaching and the aligned developments in relation to better consideration here were related to the specified orientation for the structure of transformative development in relation to the satisfaction of students. **Conclusions:** On a concluding note, it can be said that the students in private and public medical colleges in Pakistan has satisfaction issues. However, the teacher support and facility have the possibility to enhance satisfaction.

INTRODUCTION

The career in medical studies is one of the considerate career selections for majority of students in Pakistan. In order to service humanity, gain social and financial benefits and as per the willingness of parents to see their children as doctors, huge amount of students take admission in medical colleges of Pakistan. In that respect a relevant study has highlighted that nearly half of the students enrolled within the medical careers are dissatisfied from the curriculum and way of teaching within the medical colleges in Pakistan [1]. It highlighted the aspect that dissatisfaction of students is one of the primary issue faced by the students within the medical colleges of Pakistan. This consideration of dissatisfaction is not an effective situation for the students within the medical colleges. The main aspect/impact in this case has been observed on the mental distress of the students. The primary distress in this case influences the consideration of academic performance, as the negative impact has not been observed directly, but it lead to poor performance in collaboration with other factors [2]. There can be multiple reasons for the development of differentiated considerations in relation to the development of stress among the students within medical colleges. Sometimes the students are equipped with the pre-associated factors on the side of family as well. The debt taking among the students belonged to non-developed families have been observed to develop a considerate stress among the students affecting their performance within the medical colleges and mental health as well. In that respect for the issues of mental health and satisfaction of the students within the medical colleges, the following study has been prospected on the consideration to evaluate about the satisfaction of students in between the public and private sector students. A difference in between the stress level of students has been observed in the public and private sector medical colleges of Pakistan [3]. The satisfaction of students is very important within the medical colleges as it helps in the development of self-confidence in relation to the educational practices within the medical colleges [4]. In another research for the medical students and their performance analysis has highlighted that students satisfied from the education structure within the medical colleges support the development of effective academic performance [5]. It supported the idea that satisfaction of students within the medical college is related to the development of better performance along with the increased self-confidence. In that possibility the following research aimed to identify the satisfaction of the students in between the medical colleges of public and private sector medical colleges of Pakistan. The objectives of the research included assessing the different consideration supporting towards the development of dissatisfaction among the students.

METHODS

The selection of effective research design in important in relation to the developmental context for data collection, analysis and results modeling. It also influences the respective quality of the research [15]. In that aspect to maintain the factor of quality in respect to data collection and its evaluation for the research aim primary qualitative research design has been employed within the following research. The main aim for the current research revolves around the analysis of satisfaction of student for the public sector and private sector medical colleges in Pakistan. The qualitative research deign is associated with the collection of norms, opinions and the theoretical perspectives in relation to the certain issue [16]. It supports the consideration for collecting detailed perspective regarding the satisfaction of students in the public and private sector medical colleges in Pakistan. In order to collect detailed perspectives from the students within the public and private sector medical colleges in Pakistan, interviews have been selected as the standard tool for the current research. The semi-structured interviews were selected for the current research, as these provided the possibility for collecting the data through open ended questions from the participants [17]. So, the interviews provided the expressive possibility towards collecting efficient data in from of opinions and experiences from 5 medical students enrolled in the public sector medical colleges and 5 medical students from private sector medical colleges in Pakistan. The study duration was eight weeks. The study was approved by the Institutional Review Board, reference# DIR/KMU-EB/PS/0078 dated 09-09-2021. The non-probability sampling technique was implied to select the participants. It is due to the fact that non-probability sampling is a non-expensive technique for sampling, and it is also time saving as it does not include any control factor for selection from large sample [18]. The data were collected in form of scripts and were analyzed using the thematic analysis.

RESULTS

The interviews carried out with the students of the medical colleges in the public and private sector colleges in Pakistan highlighted about different aspect regarding the satisfaction consideration among them. Based on them different themes were developed within the following section for discussing about the respective factors of stress and the experience of students. The 1st theme highlighted about the general experience of the students in which the public and private sector students had provided different aspects. One student from the public medical college said;

Yeah the experience is okay, like everyone in our college has the same experience everyone is having a tough routine, the study hours are not that lengthy in the college, however the hostel mess, the tiring routine and workload sometimes causes dissatisfaction

On the other hand a student from private medical college stated;

I would say that the experience is mixed, some of my friends complain about the facilities provided in comparison to the high amount of fees they paid. I personally feel that the pressure is high for managing the study, tough routine along with the hospital shifts simultaneously

These aspects highlighted the consideration that on the main consideration the students do feel dissatisfaction due to their tough routine in relation to the academic and

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the professional work. The consideration of facilities provided was also a source of dissatisfaction among them. The in-efficient facilities and support to the students was observed to influence the psychological distress among the students due to which the respective satisfaction issues are developed [19]. So, the mental well-being was one of the primary considerations towards reducing and increasing the mental distress and dissatisfaction.

The 2nd theme was developed in order to explore about how the public and private sector medical college students for the satisfaction. On that aspect one of the student from private college stated that;

I believe the medical college students in the public sector are more efficient and prospective in terms of developing their knowledge, as they are more directly associated with the medical institutes and the respective hospitals which is indeed the development towards better orientation for the enhanced knowledge building.

On the other hand one form the public sector college stated that;

The private medical college students study in more advanced environment as compared to us. No doubt we are more aligned with the practical experience closely, but in that aspect the facilities provided to them are more advanced such as the multimedia technology, expressive infrastructure and the more alignment with the international standards of medical education.

A contrast was observed for what the students feels about the respective orientation towards the development of better infrastructure they get to have the orientation of better structure towards the student satisfaction. This was evident from the case of Peshawar Medical College study, in which the students from the private sector had the respective higher score in relation to the educational structure respectively [20].

DISCUSSION

The analysis from the developed themes highlighted that on the main classification, there is a difference for the satisfaction in between the students from the private and public sector medical colleges within Pakistan. The main possibilities in this relationship had been related to the developmental specifications towards the facilities and other related considerations for the students in the medical colleges. The perception of facilities was one of the key aspects in relation to the student satisfaction. The satisfaction of the students within the public sector medical universities in Karachi have been observed to influence positively over the specific specialties in the medical college students respectively [21]. There are different factors which have been reviewed from the literature studies to influence the satisfaction of students within the medical colleges. The learning model adopted within the online learning aspect has been observed to influence the consideration of satisfaction among students [8]. The learning model include the learner`s dimensions, technological facilities, course management and communication techniques along with the characteristics of instructors. All these aspect have be observed to influence the satisfaction of students within the medical colleges and also for the transition to the online education as well [9]. Apart of these factors the well-being of students is also a crucial aspect in enhancing the satisfaction of students with respect to the studies curriculum and the environment. The well-being enhancement with the inclusivity of multiple activities has an influence over the self-care, stress reduction and building the expressive dedication among the students for better performance [10]. These aspects are important for the development of better specifications in relation to the communication structure aligned in respect to the efficient possibilities. In that respect the technical issues have been observed to influence the considered structure of the student engagement as well. Moreover the workload, and engagement has a specific relationship with the satisfaction of the employees within the medical college [11]. These are also related to the consideration of promoting developmental changes within the curriculum structure. The example here can be taken of the pandemic where online classes were implemented. The students satisfaction with the online classes and respective content studied has a close relationship with the successful implementation of the online learning along with the student performance as well [6]. Moreover the student satisfaction has been subjectively related to the enhanced focus and attention of the students within the classroom [7]. It supported the consideration that satisfaction of students is important for multiple aspects associated. The literature has provided some considerate insights from the public and private sector medical colleges of Pakistan regarding the satisfaction in students. The study carried out in one of the private sector medical university of Pakistan has highlighted that majority of the students feel dissatisfied from the standards of education along with the academic structure in comparison of international level students [12]. In the construct of educational standards, the shift to the E-learning has become an issues for the satisfaction among the students within the medical and dental colleges on the private and public sector. Out of 100 only 10.8% in public sector and 10.3% in private sector students were primarily confident over the content and educational structure they have studied through the online classes [13]. It supported the consideration that on the main orientation the students in both public and private sector are facing the issues of dissatisfaction based on multiple issues. In another research for the public and private sector medical colleges in Pakistan, it has been observed that both sector students have high prevalence of stress due to different aspects. Moreover the students from the private sector scored higher in stress as compared to the students from the public sector in Pakistan [14]. Thus the satisfaction is one of the key issue among the medical colleges in both public and private sector. Therefore, the current study aims at analyzing the satisfaction for the students within the public and private sector medical colleges in Pakistan and in that aspect the main possibilities have been related to the consideration of collecting the empirical evidence from students of different colleges. It shows that the consideration of concerns for facilities have different perspectives for the private as well as the public sector medical colleges within Pakistan. Moreover, the technological facilities and the association with the practical centers have been aligned with the operative development in relation to the satisfaction of the students. The results from the challenges to the quality assurance in the private medical colleges has highlighted that lack of valid accreditation standards, violation of rules, and weak regulatory capacity of accrediting body [21]. Thus the satisfaction of students has the respective association towards the development of basic specification towards the enhancement of knowledge respectively. In that specification there are few recommendations which can aligned for the development of student satisfaction within the medical colleges and it mainly includes the enhancement towards the medical college educational infrastructure. The facilities for living, time management and the sources of knowledge development such as technological infrastructures are important to consider on the main context of student experiences.

CONCLUSIONS

On a concluding note it can be said that the students within the medical colleges of Pakistan on the public and private sector has the specification towards promoting the satisfaction issues among the students. The main possibility in this case has been related to the operational structure for the operational intrusion of the facilities provided to the students respectively. There are different types of classifications in relation to the satisfaction difference in which the curriculum and aligned workload management play a critical role. But mainly the facilities and the teacher development has the respective specification towards better orientation of student experiences.

Authors Contribution

Conceptualization: SH
Methodology: SH
Formal analysis: SK, SSQN, MH, FD, MJK
Writing-review and editing: SK, MH, FD, MJK

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

Conflicts of Interest

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Original Article

Gender and Social Determinants of Health: A Mixed Method Study in Khyber Pakhtunkhwa, Pakistan

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ABSTRACT

Gender is recognized as a fundamental social determinant within the overarching framework of the World Health Organization's Social Determinants of Health (SDH). It is conceptualized as a central factor influencing population health and contributing to health inequalities. **Objective:** To investigate disparities based on gender in the social determinants of health and assess gender inequities in Khyber Pakhtunkhwa, Pakistan. **Methods:** A mixed-methods approach, comprising both a survey and an exploratory qualitative study, was employed at Mardan Medical Complex Hospital in Mardan. A total of 10 interviews were conducted with healthcare workers (HCWs), and the study included 210 patients. **Results:** Out of the 210 patients, the majority were female (107/210, 51%), while 103/210 (49%) were male. 80 out of 103 (77%) females were house wives. More female (30 out of 103) is illiterate than male (21 out of 107) in the study participants, men (25 out of 107) are more educated in the secondary and higher education than women (16 out of 103). Women have high literacy level in religious education (12 out of 103). Women (25 out of 103) are more prone to partner's verbally or physical aggression than men (15 out of 107). Among female patients, predominant challenges encompass domestic concerns, experiences of violence and abuse, a deficit of trust, and socio-cultural barriers. In contrast, a prevalent social determinant of health for males was identified as financial responsibility, contributing to a notable incidence of mental health illnesses. **Conclusions:** In conclusion, the study sheds light on significant gender-based disparities in social determinants of health (SDH) and their profound impact on the well-being of individuals.

INTRODUCTION

Social determinants of health (SDH), characterized by disproportionate and avoidable differences in health status [1]. Sex refers to stable biological attributes, while gender encompasses societal expectations, power dynamics, and prescribed roles, which can vary across time and contexts. Both sex and gender contribute to the complexity of health outcomes [2]. Gender, in this context, encompasses the societal constructs of roles, relationships, personality traits, attitudes, behaviors, values, and the relative power and influence attributed differentially to the two sexes. The interaction of gender with social, economic, and biological determinants plays a crucial role in the outcomes of tropical diseases, leading to varied health impacts for males and females [3]. Within the framework of the World Health Organization's SDH, gender is construed as a fundamental factor influencing population health and contributing to health inequalities [4]. Most health inequalities in socio-economic and gender groups are, avoidable [5]. The past two decades have seen a reappearance of international interest in the non-medical and non-behavioral precursors of health and illness, and SDH are focused [6]. SDH contribute considerably to premature morbidity and mortality particularly amongst vulnerable individuals such as women, children, the aged and minority groups [7]. A reasonable amount of research has examined mid- and downstream social determinants of health and their association to health conditions and health inequalities [8]. Efforts to improve health and decrease gaps in health need to pay better attention to addressing the social determinants of health inside and outside of the healthcare system [9]. There is growing evidence that the poor and least educated die earlier and have more health issues than the richest and maximum educated [10]. Underlying factors such as education, income, employment and social support help to describe why some individuals are healthy and others not. These causes are often called "the social determinants of health" [11]. The key to improving health is improving the conditions of daily life, particularly for disadvantaged groups [12, 13]. A randomized control trail concluded that the main social challenges identified in clinical care in Eastern Mediterranean Regions include food insecurity, poverty, illiteracy and domestic violence. Physicians attempted to help their patients by giving free medical services and free medications, launching a donation box, and referring to social workers and support services, where exists. The participants stated that Canada is generally better in dealing with the social challenges than their countries of origin [14]. A cross-sectional study on 100 participants was conducted in USA addressing social and behavioral determinants (SBD) of health. The result shows median number of negative SBDs was 4 (IQR 2.75–7.0), 96 participants had at least one unmet need, and the most common negative SBD was physical activity (75%; 75/100) [15]. Another study conducted in US shows that Patient navigators screened 11,273 patients with SDH, identifying and documenting 47,911 SDH in the electronic health record [16]. Study of South Asian countries reiterates the importance of addressing social determinants of health in tackling wealth-related inequalities in use of facility delivery services. Health policy makers should acknowledge the importance of social determinants in determining individual health-seeking behavior and accordingly set their strategies to improve access to facility delivery [17]. A qualitative study conducted in Pakistan suggest that demand-side interventions aimed at shifting attitudes toward the value of skilled maternal health care and reducing financial obstacles to accessing such services, although not misplaced, will have limited impact until they are informed by a better understanding of the social and economic realities of poor women's lives [18]. Another study was conducted to assess the independent impact of wealth status, as determined by a validated index on health outcomes in Pakistan, concluded that data from Pakistan quantify the burden of morbidity and mortality and access to health care associated with inequitable distribution of wealth in the society [19]. A study conducted in Pakistan with the national sample, comprising 14,531 children across 10 cities, revealed that inadequate school availability, low levels of female literacy and decision-making autonomy, limited awareness of vaccination benefits, and scarce social connections beyond the household. These multifaceted factors collectively interact and reinforce prevailing gender norms, perpetuating low levels of health literacy and constrained access to health services [20]. Typically, engaging in income-generating activities is associated with increased autonomy, decision-making authority, and societal respect. Given the predominant involvement of men in the paid labor force and their higher earnings, even when considering the valued domestic and other contributions of women, men generally experience greater autonomy and elevated social status. These gender-based variations in economic status and purchasing power significantly impact the health-seeking behaviors and health outcomes of both men and women [3]. Research investigating gender differences in depressive symptoms consistently reports higher symptom levels in women compared to men [21].

Gender based social determinants of health and assessment of gender inequities are not explored in the study area therefore, below in this study, we are trying to explore the gender in-equity related to SDH in Khyber Pakhtunkhwa(KP)Pakistan.

METHODS

Study was conducted in Mardan Medical Complex (MMC) a tertiary care teaching Hospital, Mardan during the timeline of January 2022 to November 2022. A mixed-methods approach was applied including a survey and an exploratory qualitative study. The study included a baseline survey through structured questionnaire from patients followed by in-depth interviews with HCW, to explore the situation. For in-depth interviews, a purposive sampling was done to enrol participate in the in-depth interviews, and enrolment was continued until data saturation is reached (total 10 interviews were conducted). Sample size for survey of patients was 210 based on 5% margin of error with a 95%confidenece level and population size as MMC is 500 bed hospital. Systematic random sampling was done for patient. Census sheet was obtained from In-patient department. In 1st two patient on the list, one was randomly selected followed by every second patient, till completion of sample size. All respondents of age above 18 years are included in the study, so their consent can be taken. Mentally disabled patients were excluded as they were not able to address their responses correctly. Data was collected through structured questionnaire. Purposive Sampling was done for qualitative in-depth interviews. For in-depth interviews semi structured questionnaire/study guide was utilized. Ethical approval is taken from the Institutional Review Board (ISRB) of MMC hospital and IRB University of the Punjab. Nursing interns were hired for data collection. Data collectors were trained prior to data collection, and initial interviews were conducted under supervision. Data from the patients was collected in examination room and Medical Officers (MO) rooms using structured questionnaire. During in-depth interview consent was obtained from the participant, and audios were recorded along with documentation by Note Taker. Quantitative data were analysed using SPSS software version 23.0. The descriptive statistics of qualitative variables are given as frequency and percentages, while mean ±standard deviation (SD) is given for quantitative variables. Qualitative data were analysed using thematic analysis. All the interviews were conducted in Urdu and recorded using audio tape. The recordings of the interviews were listened to repeatedly to get acquainted with the data and let the transcription take place correctly. The audio recordings of the in-depth interview were transcribed verbatim (and translated into English). The description of participants' data was read repeatedly to extract the significant statements related to the study. Once the data transcription was developed, the next step was to break the whole text into segments or meaning units. Meanings were formulated, and hidden meanings pertinent to phenomena were explicitly mentioned. The themes were then gathered to identify meanings of the phenomena which are common to all. The generation of predominant themes followed this. Last, information was coded according to the topic and comprehensive descriptions were developed. In the second last step, a statement was built from the comprehensive description established in the previous step. Finally, the statements were validated by the participants. If any new idea is discussed or any statement needs correction, the necessary changes are incorporated into the findings. Study purpose was explained to each participant before starting the interview. Written consent was taken from the participants to ensure willingness and verbal consent were taken from illiterate participants. Confidentiality was maintained and ensured by not asking name of the participant. Ethical approval was obtained from Ethical committee MMC Mardan (D/No.252/BKMC), and the IRBC of Punjab University (No.D/311/FIMS).

RESULTS

Majority of the respondents of the present study were male (51.0%) and married (61.9%) with mean ± SD age of 36.18±15.81. One-fourth of the respondents were illiterate (24.3%). Concerning the employment status of the respondents, more than one-third of the respondents were homemakers (38.1%) among female. While regarding income source, more than one-fourth of the respondents stated to rely on their spouse's employment (28.1%), followed by their employment income (21.9%) and business income (15.7%). The complete socio-demographic characteristics can be viewed in table 1 below.

Table 1: Socio-demographic characteristics of Respondents (Patients)

Socio-Demographics	F (%)
Gender	
Male	107 (51.00)
Female	103 (49.0)
Age	
Mean ± SD age	36.18 ±15.81
Equal to or less than 25 years of age	73 (34.9)
26-35 Years of age	50 (23.9)
36-45 Years of age	35 (16.7)
46 and above Years of age	51 (24.4)
Education	
Illiterate	51 (24.3)
Primary level schooling (1-5 years)	36 (17.1)
High school	17 (8.1)
Secondary level school	44 (21.0)
Vocational diploma/religious education	22 (10.5)
Bachelors/ masters	40 (19.0)
Children	
Mean ±SD children	2.66±2.86)
No child	89 (42.6)
1-3 child/ children	44 (21.1)
More than 3 children	76 (36.4)
Marital status	
Single	69 (32.9)
Married	130 (61.9)
Divorced/ widow/widower	11 (5.2)
Employment status	
Looking for work / unemployed	38 (18.1)
Home maker (house wife)	80 (38.1)
Part-time/full-time employment	21 (10.0)
Business man/women	19 (9.0)
Farmer	16 (7.6)
Others	36 (17.1)
Income status	
Own employment income	46 (21.9)
Spouse's employment	59 (28.1)
Government/ Insurance benefits	20 (9.5)
Loan	19 (9.0)
Business income	33 (15.7)
Income from agriculture/ investment	13 (6.2)
Others	20 (9.5)

When participants were asked regarding employment status, 80 out of 103 (77%) female participants were house wives, in employment status of male participant's majority

(31/107, 28.9%) were unemployed, 16 each out of male participants were business men and farmers. In employment status male participants were dominants and are more involved in financial responsibility as compare to female participants as shown in figure 1.

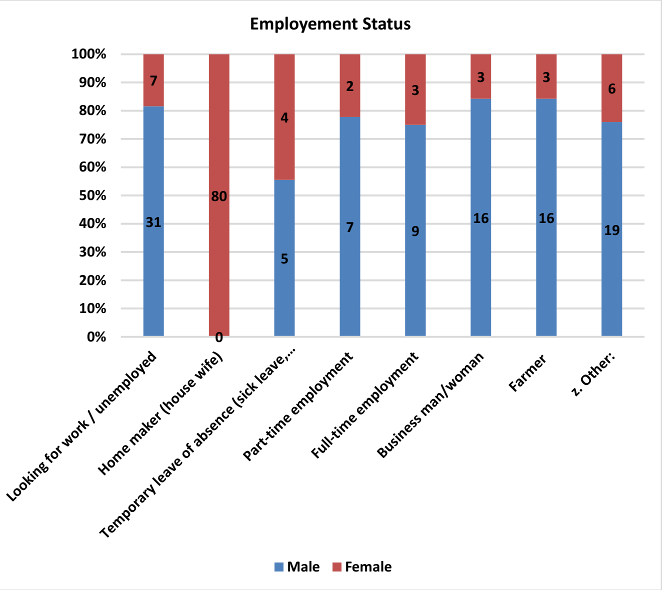

Figure 1: Employment status

More female (30 out of 103) is illiterate than male (21 out of 107) in the study participants, and there is no significant difference in primary, level education and vocational training. While men (25 out of 107) are more educated in the secondary and higher education than women (16 out of 103). Women have high literacy level in religious education (12 out of 103) and the reason is because it is free of cost, available at doorstep and most of the time it is delivered at nearby homes by female teachers for females. There is a significant difference in level of education in figure 2.

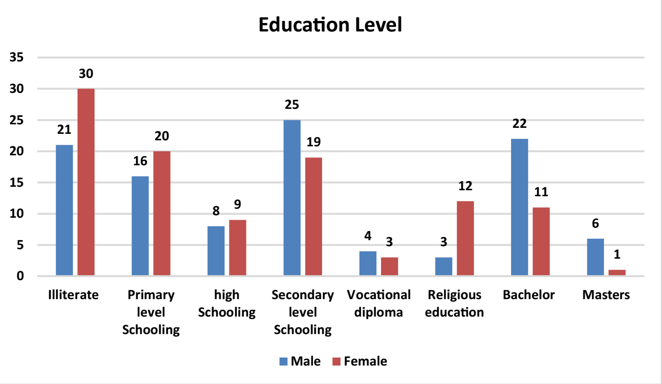

Figure 2: Education level of study participants

Most of the females are dependent on their spouse's employment (51 out of 103) and no single female have income from investment. Figure 3 shows that most female are financially dependent and few of them are have their own income sources.

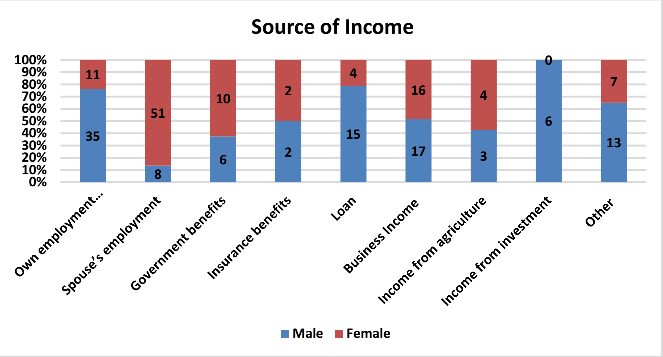

Figure 3: Source of income

Women (25 out of 103) are more prone to partner's verbally or physical aggression than men (15 out of 107) as illustrated in figure 4 below.

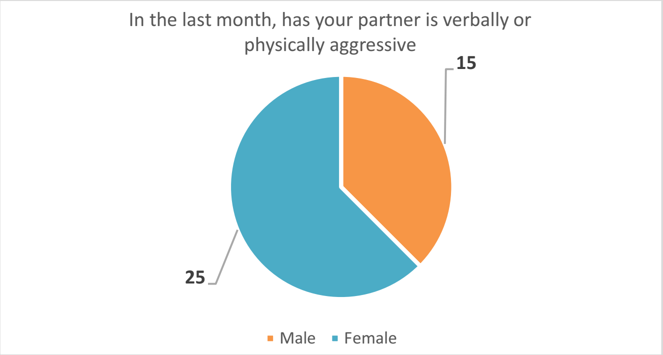

Figure 4: Verbal or physical aggression by partner

A total of 16 participants are included in in-depth interviews: seven are doctors, seven are nurses, and two are psychiatrists. The sociodemographic of all the participants included the participants' code used in the study to maintain confidentiality, participants' age, qualifications, profession, designation and working experience. The participant age ranges from 26 to 36 years while the experience of all the participants ranges from 1 to 10 years. When the study participants were asked about the gender based socio-cultural challenges their patients confront in daily life and medical emergencies, all interviewees unanimously acknowledged the prevalence of such issues. Among female patients, predominant challenges encompass domestic concerns, experiences of violence and abuse, a deficit of trust, and socio-cultural barriers. In contrast, a prevalent social determinant of health for males was identified as financial responsibility, contributing to a notable incidence of mental health illnesses. It is noteworthy that these social issues, at times, escalate to severe consequences, including suicidal tendencies. As one of the study participants narrated the story of his patient, "We often receive patients having social issues or domestic issues, previously, we have a 21-year-old female who attempted suicide by poisoning herself due to domestic issue. Further, she attempted

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suicide because her mother had cardiac arrest a week before". Sometimes these social and domestic dispute and unwanted relationships grows to limit that result in gunshot and knife injuries. The most common challenges faced by females' patients are domestic issues, violence and abuse, lack of trust and socio-cultural barriers. The most common SDH in male was financial responsibility due to which most male was having mental health illness. Sometimes, these social issues lead to serious and extreme consequences like suicidal attempts. Further, the theme also explores some gendered challenges associated with the socio-cultural issues of patients. Many interviewees noticed in their patients were the sexual harassment at home and workplace especially female are victims. On the other side, the male mostly suffered from un-employment led to anxiety and depression which in worse form goes towards suicidal attempts. Almost all study participants have experienced several socio-cultural challenges in their patients. The frequently observed issues and challenges include poverty leading to improper nutrition & delayed disease treatment, mental health issues due to negligence, unemployment & financial responsibilities in men, forced marriages in women, domestic violence & divorce as a result of mismatched marriages, etc. Most importantly, the country's current financial, political and security situation also leads to mental disorders frequently reported in different patients who treat minor diseases. One interviewee narrated socio-cultural challenges: "We have patients with different social issues, most with domestic problems. I will start with female issues. Girls are banned from school by their parents when they are teenagers; then they are married off without their consent. During the marriage, there is the issue of dowry from the in-laws. If the daughter is born to her, the in-laws taunt and tease the girls, asking her why she did not have a son. In addition, if the husband is unemployed, the in-laws also blame the wife. Then, if she wants to go to her parents for a few days to relax, that's also a problem for women's girls because the in-laws create problems for her. Some customs and rituals also affect women a lot for being female. Now, if we talk about men, the biggest problem nowadays is inflation is very high, unemployment is also very high, and there are many problems for them where they work, like harassment and abuse in the workplace. Patients keep coming up with these issues". The fundamental source of the aforementioned challenges is primarily attributed to a low level of education, resulting in unemployment and financial dependency among the youth. These circumstances can give rise to heightened levels of anxiety and depression. Additionally, domestic issues significantly impact the health of females, while the burden of financial responsibilities predominantly affects males.

DISCUSSION

In employment status male participants were dominants and are more involved in financial responsibility as compare to female participants. Most of the females are dependent on their spouse's employment (51 out of 103). Typically, engaging in income-generating activities is associated with increased autonomy, decision-making authority, and societal respect. Given the predominant involvement of men in the paid labor force and their higher earnings, even when considering the valued domestic and other contributions of women, men generally experience greater autonomy and elevated social status. These gender-based variations in economic status and purchasing power significantly impact the health-seeking behaviors and health outcomes of both men and women [3]. In study participants more female (30 out of 103) are illiterate than male (21 out of 107), while females have high literacy level in religious education (12 out of 103) and the reason is because it is free of cost, available at doorstep and most of the time it is delivered at nearby homes by female teachers for females. Our society is characterized by male dominance, with women experiencing neglect across various aspects of life. Disparities between men and women are evident in education, employment, and health. The research reveals that women encounter discrimination in pursuing professional degrees and securing higher positions. Enrollment and managerial positions in universities also exhibit a gender gap, as highlighted by the findings. The studies identify numerous barriers, including social, organizational, and personal factors, which contribute to the discrimination against women [22]. Women (25 out of 103) are more prone to partner's verbally or physical aggression than men (15 out of 107). These findings are aligned with a study conducted in Pakistan. A notable proportion of women, specifically 32% of the randomly selected sample of 150 women from health facilities in Karachi, Pakistan, have reported experiencing physical violence. Moreover, a survey conducted in Punjab, Pakistan, involving 1000 women revealed that a substantial percentage, ranging between 70% and 90%, of married women have encountered abuse from their spouses at some point in their lives. The predominant form of violence in Pakistan is identified as being perpetrated by spouses and other male relatives against women [23]. Another study conducted in Gilgit –Baltistan, Pakistan also reported higher levels of domestic violence (88.8%) psychological (69.4%), physical (37.5%) & sexual (21.2%) [24]. The present study found that gender based SDH of their patients include cultural barriers, illiteracy among female, unemployment, sexual harassment, domestic violence by elderly family members or husbands and financial responsibilities of males. These socio-cultural challenges

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not only hinder the patient's social life but also influence the health outcomes of the patients in one way or another. Literature provides evidence that different social and cultural factors, including the existing political structure, socioeconomic status, literacy, occupational opportunities, family dynamics, access to essential services, sanitation practices, exposure to hazards, availability of social support, experiences of racial discrimination, and availability of resources, and all these components are closely linked to health outcome [11]. There is a direct association between the disparities in health status among gender and the disparities in social status.

CONCLUSIONS

In conclusion, the study sheds light on significant gender-based disparities in social determinants of health (SDH) and their profound impact on the well-being of individuals. The findings underscore the prevalence of gender inequalities in employment, literacy, and exposure to violence, with women often bearing a disproportionate burden. Men, on the other hand, grapple with distinct challenges, particularly related to financial responsibilities. The study illuminates the complex interplay of cultural, economic, and societal factors contributing to these disparities, emphasizing the need for comprehensive interventions addressing not only the immediate health issues but also the underlying social determinants. Ultimately, the study underscores the imperative for targeted policies and interventions aimed at fostering gender equity and addressing the root causes of health disparities in the context of broader social determinants.

Authors Contribution

Conceptualization: SBA, JS, MI
Methodology: SBA, JS, MI
Formal analysis: SBA, JS, MI, S., MAS, HWA
Writing-review and editing: SBA

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

Factors Associated with Perceived Insecurity in Burn Injuries: An Exploratory Study of Burn Survivors in Lahore

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ABSTRACT

Burn injuries identified as a serious public health concern with high morbidity and mortality rate every year. Burn injuries are usually linked with heightened economic, social and psychological burden for causing functional impairments, social stigma, rejection and decreased social integration along with high morbidity of psychological disorders. Researchers have found various psychological phenomena impacting the recovery and effectiveness of rehabilitation of burn survivors including perceived insecurity in burn survivors. **Objective:** Present study was extracted from a larger study and aimed to explore the perceived insecurity of burn survivors seeking treatment in Lahore and to identify factors associated with it. **Methods:** The study followed a cross sectional research design to study 150 burn survivors with mean age of 36 years and including both men (39%) and women (61%). **Results:** The results revealed that female gender, single relationship status, age and education were significantly correlated with perception of insecurity in burn injury survivors. Gender and burn injury type were associated with significantly different levels of perceived insecurity in the present sample of burn survivors. The findings were discussed in light of broader research context. **Conclusions:** Demographic variables and type of burn injury relate differently with perceived insecurity among burn survivors.

INTRODUCTION

Burn injury is a common type of trauma which destroys organic tissues of skin through heat, chemicals, freezing, radiation, friction etc. [1]. Burn injury is a serious global public health issue recognized as one of the leading causes of mortality and morbidity across the world [2]. Burn injury often leaves victims vulnerable to stigmatization and social rejection for having visible scars which adversely affects their mental wellbeing [3]. Burn injuries are responsible for 180000 deaths annually and two thirds of these deaths reported in African and Southeast Asian countries [1]. Incident rate of burn injuries in low and middle income countries cumulatively makes more than 90 % of all burn injuries in the world [4]. In Southeast Asian countries burn injuries are often seen as means of assault particularly in the form of burning and acid throwing and in most of the cases the victims are females [5]. In Pakistan, there is no national burn registration program even the burn treatment centers are only established in main cities which results in lack of reliable data on exact incident rate of burn injuries in the country, however, the studies have reported it to be 147 in per one hundred thousand with mortality rate ranging from 6.5 percent to 41 percent [6]. Burn injuries are found across all age groups and socioeconomic classes and are commonly associated with various physical, social and psychological problems. Disfiguration, scarring, impaired physical functioning, economic losses, social

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stigma, social rejection, loss of self-esteem, isolation, depression and traumatic reactions are most common predicaments frequently observed in burn injury patients [7, 8]. The cost of burn injury treatment varies significantly across countries but is undoubtedly expansive. The total hospital care cost is reported to range from 10.58 US dollars to 125,597.86 US dollars per patient which is very expansive and barely affordable for most patients, particularly those living in low and middle income countries [9]. Despite getting treatment for burn injuries, the pain, social discrimination, aesthetic and functional impairments and heightened psychological distress experienced after burn injury adversely impact the self-image of the patients and become instrumental to lower quality of life and inculcate strong sense of insecurity in them [10, 11]. Emotional and somatic traumatic reactions in burn patients grabbed attention of medical health professionals and demand rehabilitative efforts to reinstate functional behaviors of burn patients [12]. Various researches have already linked emotional difficulties and physical dissatisfaction of burn with significantly reduced social functional effectiveness of burn patients [13]. Most burn survivors are seen to have heightened insecurity about their social environments which refrains joining social activities and resuming social participation[12].

In countries like Pakistan there is a strong need to assess the psychosocial burdens attached with burn injuries in order to design effective treatment programs to facilitate emotional recovery besides physical treatment and reinforce functional role of burn survivors. This is much relevant to assist burn survivors gain confidence to normalize their injury and resume active lives after burn injuries. The present study was part of a larger project conceptualized to investigate the emotional insecurities related to burn injuries and identify differences attributed to gender and type of injury in burn survivors seeking treatment in Lahore.

METHODS

The present research was based on descriptive cross sectional research design to explore the study aims. This article is extracted from a larger study conducted in Lahore during December 2020 and April 2021. The study designed was approved from ERC and IRB of Forman Christian College University Lahore through letter number IRB-231/06-2020 issued on June 16, 2020. The study sample comprised of 150 individuals receiving treatment for burn injuries from Mayo and Jinnah Hospital Lahore. Sample size was determined through g-power analysis with medium effect size and purposive sampling technique was employed to select 83 individuals with unintentional and 67 with intentional burn injuries. Individuals below 18 and above 65 years of age, those went through surgery a week before data collection, and those diagnosed with other significant physical or psychological disorders were excluded in the initial screening. The data were collected using detailed demographic sheet and perceived insecurity scale. *Demographic form* - A demographic sheet was specially designed for this study to note detailed personal and social information of study participants like gender, age, education, family income marital status, type of injury etc. *Perceived Insecurity Scale* (PIS) - To explore perceived insecurity in burn injury victims, Perceived Insecurity questionnaire developed by Valera (2010) was employed. This 29-item questionnaire assesses the level of insecurity in a respondents. This questionnaire has 5 subscales namely previous threat experiences , perception of insecurity , personal control and coping skills, social representations of insecurity and potential aggressors that record responses on a 4-point Likert scale ranging from 1 to 4 (strongly agree) and the scale's reliability calculated through Cronbach alpha was reported to be 0.85. As a first step internal consistency of scores of perceived insecurity scale and its subscales for the present study sample was assessed and for composite score observed to have an alpha value of 0.82 falling in above average range. Perception of insecurity subscale had a=0.63, previous threat experience a=0.72, social representations of insecurity a=0.65, potential aggressors a=0.75 and personal control and coping skills a=0.79. Cronbach alpha values for all the subscales noted to fall in the acceptable range. The study design was approved by ERC and IRB of Forman Christian College University and permission was sorted from author of the perceived insecurity questionnaire to use it and concerned officials for data collection. A pilot study was completed on individuals seeking out patient services from Punjab institute of mental health and Jinnah hospital Lahore to test the comprehension of data collection measures, time taken to fill measures and quality of the print. Font size of the measures was adjusted in light of the feedback of pilot study participants. The data were collected between December 2020 and April 2021. Actual study participants first received a detailed informed consent form which included information about research, participants' ethical rights etc. Then they were given demographic sheet and perceived insecurity questionnaire to fill and all participants received these data collection forms in the same sequence. After completion of research instruments all participants were thanked for their participation. The data were analyzed through Statistical package for social sciences version 22.0 (SPSS), both descriptive and inferential statistical procedures were used to process the data. The study data were analyzed through SPSS and used a range of descriptive analysis to summarize the data.

Pearson product correlation and independent sample t-test were carried out to assess association among study variables and group differences attributable to different factors.

RESULTS

The study data were analyzed through SPSS and used a range of descriptive analysis to summarize the data (Table 1).

Table 1: Descriptive of Personal Demographic Variables

Variables	F (%)
Gender	
Male	58 (39)
Female	92 (61)
Marital Status	
Married	64 (43)
Unmarried	59 (39)
Widowed	9 (6)
Divorced	18 (12)
Socioeconomic Status	
Lower	45 (30)
Middle	80 (53)
Upper	23 (15)

The mean age of the participants was 36 (SD= 0.94) years. Females outnumbered male patients significantly with most participants being married. Majority of the burn victims belonged to middle socio-economic statuses (Table 2).

Table 2: Descriptive of Burn Injury Characteristics

Variables	F (%)
Burn injury source	
Fire	67 (45)
Chemicals	32 (21)
Hot water	33 (22)
Motorbike Silencer	5 (3)
Hot coal	6 (4)
Hot iron	7 (5)
Type of burn injury	
Unintentional	83 (55.3)
Intentional	67 (44.7)

The frequency and percentages of variables such as source of burn injury and type of burn injury was assessed and the incident rate of unintentional or accidental burn injuries were found to be significantly higher than intentional burn. The most common source of burn injury was observed to be fire (45 %) and motor bike silencer was the least frequent cause of burn injury (3%) in the present study participants (Table 3).

Table 3: Mean Scores of Perceived Insecurity across Groups

Variables	Mean ± SD
Gender	
Male	67.14 ±10.79
Female	79.52±9.87
Marital Status	
Married	72.62±11.86
Unmarried	83.67±6.95
Widowed	73.44±12.82
Divorced	74.49±11.91
Socioeconomic Status	
Lower	76.09±10.86
Middle	75.15±11.61
Upper	68.78±12.25
Burn injury source	
Unintentional	71.99±11.30
Intentional	78.13±10.86

The findings reveal that female burn survivors scored higher on perceived insecurity. Burn survivors who were single scored significantly higher compared to any those with any other relationship status. Burn survivors belonging to upper socioeconomic class had significantly lower perceived score than burn survivors from lower and middle socioeconomic levels. Survivors of accidental burn injuries had a lower average perceived insecurity score compared to those in intentional burn injuries (Table 4).

Table 4: Correlation between Perceived Insecurity and Demographic Variables (N=150)

Variables	1	2	3	4	5	6	Cohen's d
PI	1	-	-	-	-	-	0.52
Age	-.23**	1	-	-	-	-	0.84
Gender	.51**	-.28**	1	-	-	-	2.15
SESa	-.18*	.02	.09	1	-	-	1.33
Marital Status	.26**	-.11	.21*	-.23**	1	-	0.95
Education.	.19*	.06	-.18*	-.13	.05	1	0.42

a. Socioeconomic Status. *p<.05, **p<.01

The results revealed that perceived insecurity shared a significant inverse association with increasing age (p<.01) and socioeconomic status (p<.05). Interestingly, unintentional/accidental burn injuries also had negative association with perceived insecurity scores. However, perceived insecurity was positively associated with female gender (p<.01), being single (p<.01) and higher educational level (p<.05).

Table 5: Mean, Standard deviation, t-values, and Cohen's d values of Perceived Insecurity (N=150)

Variables	M	SD	T	P	95 % CI	
					UL	LL
Gender						
Men (n=58)	67.14	10.79	-7.07	<.001	-15.85	-8.91
Women (n=92)	79.52	9.87				

Type of Injury						
Accidental (n=83)	71.98	11.30	-3.24	<.001	-9.89	-2.39
Non-Accidental (n=67)	78.13	11.73				

Note. Df = 148. CI=Confidence Interval. UL= upper limit, LL=lower limit

An independent sample t-test was also used to analyze and compare the perceived insecurity among unintentional and intentional burn victims. There was a significant difference in scores for unintentional burn victims and intentional burn victims (p=.001) as participants with intentional burn injury had higher score on perceived insecurity. The magnitude of the differences in the means was moderate (eta squared=.07). The findings also reveal that both groups showed significant differences in previous threat experience (p=.006), social representations of insecurity (p=.004), potential aggressors (p=.00), personal control and coping skills (p=.001). No significant difference was found in perception of insecurity (p=.32). In general, these results showed that the patients with unintentional and intentional burn injuries perceived dimension of insecurity differently from one another, but their overall subjective experience of perceiving insecurity was similar.

DISCUSSION

The rationale of the present study was to assess the personal and injury related factors that link significantly with perceived insecurity in burn victims, after having surgery. For this purpose a sample of 150 burn victims was studied from the burn units of Lahore, Pakistan. Most of the burn victims are likely to experience various psychological problems after burn injury from which emotional insecurity and problems related to it are common [13, 14]. The findings of the present study also confirmed that majority of the burn survivor scored significantly higher on insecurity and its related problems which aligned with findings of other studies reporting dissatisfaction and psychological disturbances after burn injuries [14, 15]. Perceived insecurity in the present study was observed to get lower with age and high income which aligns with findings of many other studies [16]. Young individuals are most likely to place more attention on physical attractiveness thus remain more conscious of their own physical appearance than their older counterparts. Physical scarring after burn might have made the younger patients more conscious of losing physical appeal to others which consequently must have increased their insecurity [16]. Better income levels usually provide easy access to better resources, therefore, the higher income might developed this awareness of availability of better treatment even cosmetic procedures to treat the scars or at least camouflage to improve the body aesthetics. This finding can be supported by inferences drawn in previous studies that utilization of advanced treatment improved body image and social participation of burn victims [15]. The findings were also consistent with conclusions of the previous studies reporting that burn patients from disadvantaged backgrounds generally show more psychological difficulties and lower participation in socially integrated activities even after recovery [17, 18]. In present study, females showed significantly higher levels of insecurity. Women are generally observed to be more conscious of their physical attractiveness as they face harsh social judgment on physical appearance compared to males, and likely to pay a lot more attention to body aesthetics than males. This must have contributed to the higher levels of insecurity among female participants in present sample. This finding can be supported by findings of previous studies [14] reporting that visible burn scars result in lower social integration particularly in female burn survivors [13]. Insecurity was higher among those who were single and had higher educational levels, these findings are supported by other researches that recorded higher levels of appearance anxiety and related psychological distress in single and highly educated burn patients [19]. Physical attractiveness plays an instrumental role in social acceptance and rejection and single burn survivors might be fearful of losing attraction particularly for potential relationship partners and also getting social rejections otherwise. Higher insecurity might reflect that education makes individuals more insightful and aware of their problems, education is also likely to develop better understanding of social judgmental biases making the individuals more aware of their physical appearance which many at times actively manipulates social acceptability. Specific type of burn injuries can lead to different kind psychological distress, this also supports the current findings which noted that individuals in intentional burn group scored significantly high on perceived insecurity [20, 21]. Some studies have concluded that kind of burn injury does not influence the feeling of insecurity of going back to social situations or environments where the burn injury took place or social settings where they are likely to get judged on their scars [22]. However, most of the previous studies reported higher levels of insecurity and psychological distress among intentional burn injury survivors compared to unintentional burn injury cases [23]. Despite the limitation that data were only collected from one city, current findings will help to fill in the research gap. As the perceived insecurity was not studied in burn survivors in Pakistan earlier. This research can also help future researchers to explore this significant area more to facilitate the rehabilitation of burn survivors.

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CONCLUSIONS

This study was conducted to investigate significant differences in perceived insecurity attributed to various demographic factors among burn survivors. Findings of the present research revealed that the demographic factors are associated with significantly different levels of perceived insecurity in burn survivors.

Authors Contribution

Conceptualization: AN, KA, TN
Methodology: AN, KA, ES, ISS, KI
Formal analysis: AN, KA, ES, TN
Writing-review and editing: AN, ES, TN, ISS, KI

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

Clinical Inertia in Terms of Recurrent Hospitalization in the Treatment of Heart Failure Between General Physicians and Cardiologists

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ABSTRACT

Cardiologists are more likely to use clinical guideline-supported therapies than general physicians, a fact that has been shown to reduce readmissions. **Objective:** To compare the intensification of heart failure treatment and its course with re-hospitalization among general physicians and cardiologists at a tertiary care hospital. **Methodology:** An observational cross-sectional study was conducted in the cardiology inpatient department of a tertiary care hospital from June 2023 to December 2023 for six months. All patients admitted with acute decompensated heart failure with reduced ejection fraction were included. The treatment prescriptions that they had been followed before the event were noted along with the fact that whether they were treated by a cardiologist or a general physician, and their compliance with medical treatment was recorded. Frequencies and percentages were computed for qualitative variables. **Results:** A statistically significant association of re-admission was observed among cardiologists (1.40 ± 0.57) compared to general physicians (2.54 ± 0.57; $p<0.001$). Almost 100% of cardiologists advised beta blockers as compared to their prescription by 42% of general physicians. All cardiologists advised ARBS/ACE inhibitors as compared to 58% of general physicians. 90% of cardiologists advised aldosterone receptor antagonists as compared to 10% of general physicians. Only 12% of cardiologists advised SGLT-2 inhibitors as compared to 88% of physicians. Overall, 36% of cardiologists recommended guideline-mediated therapy while 12% of general physicians recommended guideline-mediated therapy. **Conclusions:** Cardiologist care is significantly associated with reduced re-admissions among patients re-admitted after heart failure treatment.

INTRODUCTION

Heart failure (HF) is a widespread health issue that is becoming more prevalent worldwide. It has significant negative effects on mortality and morbidity, including low quality of life, reduced functional capacity, and substantial costs [1]. HF is not only an expensive long-term illness but also a potentially fatal one. The high rate of hospitalizations related to HF severely burdens our healthcare systems [2, 3]. Among adults, HF is the leading cause of hospitalization, and 1-year mortality rates range from 10% to 35% in several population-wide registries, which is significantly higher in patients with severe heart failure [4, 5]. It has been observed that a significant number of patients who are discharged after being hospitalized for heart failure (HF) end up returning to the hospital within 30-60 days [6, 7]. This high rehospitalization rate is a cause for concern. Factors such as socioeconomic status, living in low-income neighborhoods, experiencing poverty, or lacking social support have been found to contribute to readmissions, along with the quality of the hospital [8, 9]. Reducing heart failure hospitalizations and readmissions is a national priority. Research shows that implementing disease management programs can reduce readmissions from heart failure by 30% and the combined endpoints of death and readmission by up to 18% [9, 10]. Studies have

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shown that cardiologists have a higher success rate in lowering mortality rates in patients with heart disorders compared to general physicians [10, 11]. This is because they are more likely to follow clinical guidelines and have a better understanding of appropriate therapies for these types of ailments. If a patient with a cardiovascular ailment is being treated by a general practitioner, it is recommended that they be referred to a cardiologist for specialized care. After being discharged, it is now standard practice for patients with congestive heart failure (CHF) to receive early physician follow-up care. This has been linked to a decrease in 30-day readmissions, as evidenced by multiple studies [11, 12]. Heart disease patients treated by cardiologists had lower risks of pneumonia, septicemia, urinary tract infection, and in-hospital mortality (OR = 0.61, 0.49, 0.76, and 0.37, respectively) than those treated by physicians. Additionally, the average length of hospital stay for cardiologists' patients was shorter than physicians' patients (7.7 ± 19.7 vs. 5.7 ± 7.0 days) [12, 13]. In a country with limited resources and an abundance of heart disease scarce information is available regarding the general physicians versus cardiologist outcomes due to HF.

The purpose of this study is to compare the mean number of readmissions after the treatment of HF with general physicians versus cardiologists. Due to the rising burden of heart failure, such studies must be performed so that they will guide clinicians to treat patients well in time.

METHODOLOGY

After getting approval from the Institutional Ethical Review Committee with IRB number IBC KU-389/2023, this observational cross-sectional study was conducted from June to December 2023 in inpatients of a tertiary care hospital. All patients admitted with acute decompensated heart failure with reduced ejection fraction regardless of etiology were included. The treatment prescriptions that they had been followed before the event were noted along with the fact whether they were treated by a cardiologist or a general physician etc. and their compliance with medical treatment was recorded Only those patients were included who had followed up to 3 OPD/6 weeks to their respective physicians for their treatment optimization prior to their decompensation. Before the enrolment of patients in the study, participants were briefed about the purpose of the research and its benefits, and a written consent was taken. The calculated sample size was 14 participants a with 95% confidence level. Patients of both genders with ages ranging between 18 to 85 years, having ejection fraction (EF) < 40%, and on treatment of HF were included. Hypotensive patients and pregnant women were not part of this study. Patients with known malignancies, congenital heart disease, acute kidney injury, and chronic kidney disease were also not included. The New York Heart Association (NYHA) classification system was used to assess the patient's functional class. All the demographic details of the patients, i.e. age, gender, body mass index, comorbid, systolic blood pressure, diastolic blood pressure, heart rate, any previous surgery /procedure, and medications were noted. The findings of echocardiography specifically EF was reported in all patients as per hospital protocol. The outcome of readmission was noted. All data was recorded by a principal investigator on a predesigned proforma. The SPSS version 26.0 was used for data compilation and analysis. Frequencies and percentages were computed for qualitative variables like gender, HTN (hypertension), DM (diabetes mellitus), smoking, family history of IHD (ischemic heart disease), addictions, NYHA functional class, medications, and history of procedures. Quantitative variables were presented as mean ± SD like age, weight, height, body mass index, EF, SBP, DBP, heart rate and no of hospital readmission. The Shapiro-Wilk test was used to check the normality of the quantitative data. If the data is non-normal, the median and interquartile (IQR) were reported. Independent sample t- test or otherwise Mann-Whitney U test was applied (as appropriate) was used to compare mean readmission between two groups. The chi-square test was applied for finding association between categorical variables. Effect modifiers like age, gender, weight, height, body mass index, ejection fraction, SBP, DBP, heart rate, HTN, DM, anemia, smoking, family history of IHD, causes of heart failure, addictions, and NYHA functional. P-value ≤ 0.05 was considered as significant in all analysis.

RESULTS

In our study, we enrolled one hundred patients being treated for acute decompensated heart failure at a tertiary care hospital. The mean age of patients was 53.17 ± 11.21 years. Out of which 67 were male, 83 were hypertensive, 50% were diabetic, 40% were smokers and 3% were alcoholic. The mean BMI of patients was 31.82 ± 1.76. The patients admitted had a mean ejection fraction of 33.95 ± 5.47, summarized in table 1.

Table 1: Baseline characteristics of the study population (N=100)

Demographics		N (%)
Age (years)		53.17 ± 11.21
Gender	Male	67 (67)
	Female	33 (33)
Hypertensive		131 (85.6)
Smoker		131 (85.6)
Diabetic		22 (14.4)
Alcoholic		22 (14.4)
BMI		22 (14.4)
Ejection Fraction (%)		22 (14.4)

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The systolic blood pressure, diastolic blood pressure, and heart rate were found as 119.50 ± 9.95mmHg, 69.70 ± 6.37 mmHg, and 70.24 ± 3.66 bpm in the cardiologist group and 129.56±15.90 mmHg, 78.50 ± 11.38mmHg and 82.04 ± 7.89 bpm in physician group respectively. The systolic blood pressure, diastolic blood pressure, and heart rate had a statistically highly significant mean difference between cardiologists and general physicians (p < 0.001). According to the NYHA, 35 (70%) had ASA II and 15 (30%) had ASA III in the cardiologist group while 43 (86%) had ASA II and 7 (14%) had ASA III in the general physician group. The difference was also not statistically significant (p= 0.053). The results for the association of clinical findings with study groups are presented in table 2.

Table 2: Association of demographic and clinical findings with cardiologists and general physicians group.

Parameters	Health Professionals		Total Mean ± SD	p-value
	Cardiologists (Mean ± SD)	General Physicians (Mean ± SD)		
Systolic blood pressure (mmHg)	119.50 ± 9.95	129.56 ± 15.90	124.531413	<0.001*
Diastolic blood pressure (mmHg)	69.70 ± 6.37	78.50 ± 11.38	74.10 ± 10.19	<0.001*
Heart rate (bpm)	70.24 ± 3.66	82.04 ± 7.89	76.14 ± 8.52	<0.001*
NYHA Functional class	**N (%)**	**N (%)**		
Class 2	35 (70)	43 (86)	78 (78)	0.053**
Class 3	15 (30)	7 (14)	22 (22)	

All 50 (100%) cardiologists advised beta blockers to their patients however, 21 (42%) of physicians advised beta blockers to their patients, this was significant (p< 0.001). All 50 (100%) cardiologists advised ARBS/ACE inhibitors to their patients while 29 (58%) physicians advised ARBS/ACE inhibitors to their patients, this was also significant (p< 0.001). A total of 45 (90%) cardiologists advised Aldosterone receptor antagonists to their patients however, just 5 (10%) of physicians advised Aldosterone receptor antagonists to their patients, this was also significant (p<0.001). Only 6 (12%) cardiologists advised SGLT-2 inhibitors to their patients while 44 (88%) physicians advised SGLT-2 inhibitors to their patients, this was also significant (p<0.001). Overall, 36% of cardiologists recommended guideline-mediated therapy while 12% of general physicians recommended guideline-mediated therapy (p=0.005). The detailed results are also presented in table 3.

Table 3: Association of HF causes, and treatment given by cardiologists and general physicians group [N(%)]

Parameters	Health Professionals		Total (N=100)	p-value
	Cardiologist (N=50)	General Physicians (N=50)		
Beta-blockers				
Yes	48 (96)	23 (46)	71 (71)	<0.001*
No	2 (4)	27 (54)	29 (29)	
ARBS/ACE Inhibitors				
Yes	45 (90)	31 (62)	76 (76)	0.001*
No	5 (10)	19 (38)	24 (24)	
Aldosterone Receptor Antagonists				
Yes	37 (74)	11 (22)	48 (48)	<0.001*
No	13 (26)	39 (78)	52 (52)	
SGLT-2 Inhibitors				
Yes	37 (74)	12 (24)	49 (49)	<0.001*
No	13 (26)	38 (76)	51 (51)	
GDMT				
Yes	18 (36)	6 (12)	24 (24)	<0.001*
No	32 (64)	44 (88)	76 (76)	
Hospital re-admissions				
1	32 (64)	0 (0)	32 (32)	<0.001*
2	16 (32)	25 (50)	41 (41)	
3	2 (4)	23 (46)	25 (25)	
4	0 (0)	2 (4)	2 (2)	

The mean re-admission was noted as 1.40 ± 0.57 in those patients who were treated with cardiologist while 2.54 ± 0.57 in those who were treated with general physicians. We found a statistically significant association of re-admission among cardiologists and general physicians (p<0.001). Results are represented in figure 1.

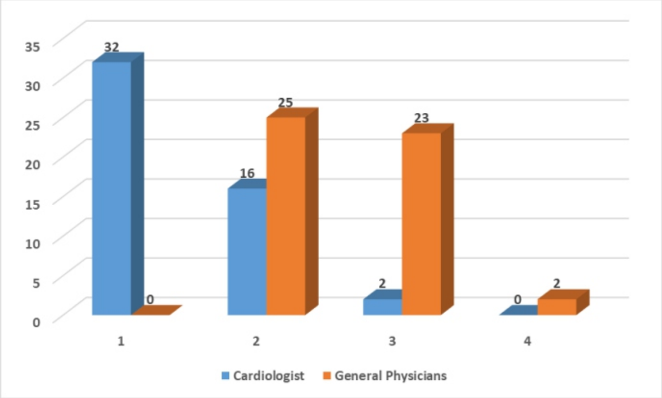

Figure 1: Number of hospital readmissions of patients between cardiologists and general physicians.

DISCUSSION

The study found that 36% of cardiologists and 12% of general practitioners suggested guideline-mediated therapy. Among general physicians, 42% recommended beta blockers, while all cardiologists gave this advice.

Additionally, the study found that the care provided by cardiologists resulted in significantly lower readmissions compared to the care provided by general practitioners. Heart failure remains the leading cause of hospitalization and mortality worldwide. It is associated with adverse outcomes such as hospitalization and death, making it a major public health concern of the 21st century [14]. Research shows that the new guideline-directed medical therapy (GDMT) is not being initiated early enough in the treatment of heart failure, despite explicit recommendations. Improving outpatient care for individuals with heart failure can reduce and prevent heart failure-related morbidity and mortality [15]. This study draws two important conclusions. First, patients received inadequate post-discharge care. Second, during the study period, nearly half of the heart failure patients experienced clinical inertia. In the weeks following a patient's discharge from the hospital due to heart failure, their medication usage does not seem to increase significantly, even though their condition is far from being under control. Despite improvements over time, there is still concern about the lack of adherence to recommended treatment guidelines, and various theories have been proposed to explain the discrepancy. Our study demonstrated that even after six weeks, physicians as compared to cardiologists did not recommend MRA to 90% of patients, only 42% received beta-blockers, and 58% received ACE-I (or ARB) whereas cardiologists also did not prescribe 88% of patients SGLT2 receptor inhibitors. In total, 12% of doctors and 36% of cardiologists suggested treatment that was guided by recommendations. Smeets M et al., reported that managing heart failure is a challenging and labor-intensive task that requires a great deal of experience. Young general practitioners often lack confidence and experience when dealing with these illnesses. However, elder general practitioners become more self-assured and take an active role in heart disease therapy as they gain experience. Despite age-related differences, some doctors may find it difficult to keep up with heart failure treatment due to difficult situations and impulsive decision-making [16]. In the same survey conducted by Smeets M et al., general practitioners (GPs) voiced concerns about how an increasing workload might affect their primary job. Additionally, the patient's comorbidities and polypharmacy make heart failure management particularly challenging. Some general practitioners also lack confidence and understanding in cardiology [17]. Hancock HC et al., pointed out that the challenge of caring for a large number of elderly patients and the lack of proper medical resources makes it difficult for general practitioners (GPs) to diagnose heart failure. As a result, a small number of GPs think that using natriuretic peptides, which have been approved by guidelines, could help diagnose heart failure with greater certainty [18]. Wu YM et al., found that heart disease patients who received cardiology care while hospitalized had a lower 30-day risk of in-hospital death than those who received medical care from other doctors. Our investigation supports this finding [19].

We also discovered a strong correlation (p= 0.001) between hospital readmissions and the treatment provided by general practitioners and cardiologists in research conducted by Driscoll A et al. However, individuals with related comorbidities have a higher than 50% probability of being hospitalized. According to our research, less than 50% of patients had received advice from their general practitioners about ACEI/ARBs [20]. A similar study conducted in Tanzania by Sadiq AM et al., also showed that ACEI/ARB deficiency is a risk factor for heart failure hospitalization. However, the study has some limitations, such as a small sample size, retrospective data collection from readmitted patients, and a single-center design [8]. However, this study can serve as a framework for future studies on a similar topic. We recommend experimental studies to compare the cardiologist and GPs treatment in patients with heart failure and improve the diagnostic and therapeutic procedures without any delay.

CONCLUSIONS

In conclusion, the study results showed that cardiologist care was associated with reduced re-admissions among patients re-admitted after heart failure treatments.

Authors Contribution

Conceptualization: KUS
Methodology: KUS, AS, SS, MWA, FS, FF
Formal analysis: AS, SS, MWA, FS, FF
Writing-review and editing: KUS, AS, SS, MWA, FS, FF

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

Effect of Intracameral Moxifloxacin on Endothelial Cell Count and Endophthalmitis Prophylaxis After Cataract Surgery

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ABSTRACT

One of the most feared side effects of contemporary cataract surgery is still endophthalmitis. Prophylactic measures include the use of antibiotics: topical, subconjunctival, and intracameral, to avoid endophthalmitis. Moxifloxacin 0.5% has been used most frequently in preventive late-stage regimens. **Objective:** To ascertain how well moxifloxacin prevented endophthalmitis in patients having cataract surgery. **Methods:** This was a descriptive case study and was conducted at Eye Departments of Allama Iqbal Medical College, Jinnah Hospital, Lahore and Ameer-ud-Din Medical College, Lahore General Hospital, Lahore. The study was commenced after approval of the synopsis and completed in 6 months. **Results:** In this study, 23.75%(n=19) were between 40-50 years, 61.25%(n=49) between 51-60 years and 15%(n=12) had >60 years of age, and their average was calculated as 53.99+6.22 years. 58.76%(n=47) were males and 41.25%(n=33) were females in the study. Mean endothelial cell count before cataract surgery was calculated as 2776 +177 while post-operative the average endothelial count was calculated as 2424 +72.8. while the frequency of effect of moxifloxacin, in the prevention of endophthalmitis in patients undergoing cataract surgery was recorded as 22.5%(n=18) while 77.5%(n=62) had no effect of moxifloxacin while preventing endophthalmitis in patients undergoing cataract surgery. **Conclusions:** We conclude that the effect of moxifloxacin, in preventing endophthalmitis in patients undergoing phacoemulsification surgery is not significantly higher and may be used in our setup for prevention of endophthalmitis, being a risk factor for blindness. Moxifloxacin does not affect the corneal endothelial cells significantly.

INTRODUCTION

Ocular inflammation known as endophthalmitis is brought on by the growth of bacteria or fungi in the posterior region of the eye [1,2]. Devastating complications after cataract surgery include acute endophthalmitis, which has an estimated incidence rate of 10% Gram-negative and 0.15% Gram-positive. There has been debate on the usefulness of antibiotics in preventing endophthalmitis. It has not been demonstrated that topical medication for three days before to surgery lowers the risk of infection, but it can lower the bacterial count [3-6]. One of the serious side effects of cataract surgery is endothelial toxicity, which can result in corneal decompensation [7]. It is frequently iatrogenic and arises from mechanical or drug-induced assault to the endothelium. In young individuals, the typical endothelial cell density is higher than 3000 cells/mm2. Within the cataract age group, the average density is 2250 [8]. Since vancomycin and cefuroxime may cause problems, moxifloxacin, a fourth-generation fluoroquinolone, appears to be a better option for preventing endophthalmitis due to its broad-spectrum coverage and mode of action, which includes gram-positive and negative micro-organisms, and anaerobes [5,9-11]. For topical and systemic application, it is safe and effective; however, there is little information on its prophylactic intracameral administration for the prevention of endophthalmitis. Numerous investigations have found no negative effects of intracameral moxifloxacin on endothelial cell count following cataract surgery[12-15].

The current study's goal was to ascertain how intracameral moxifloxacin affected the number of endothelial cells in our environment, so facilitating a better understanding of the dynamics at play and illuminating strategies for preventing endophthalmitis, a risk factor for blindness.

METHODS

This multi-center descriptive case research was carried out in the Ophthalmology Departments of Ameer-ud-din Medical College and Allama Iqbal Medical College in Lahore, Pakistan. The study was carried out following the institutional review board of each hospital's acceptance of the summary vide letter No. AIMC/ERB/2023/4313 dated 01.02.2023. Using the WHO sample size calculator, we determined the sample size of 80 patients, assuming a 9.5% mean reduction with a 95% confidence interval and a 6.5% margin of error [13]. The study's patients were included after non-probability, purposeful sampling. We enrolled patients in the study following the selection criteria as individuals of every gender above 40 years old having age-related cataracts identified by ophthalmoscopy diagnosis and preoperative endothelial cell count was 2200-3000 cells/mm2 calculated by specular microscopy. Tonometry and OCT were used to diagnose glaucoma and patients having glaucoma were excluded from the study. Conditions of the cornea identified by slit-lamp biomicroscopy, such as corneal ectasias (keratoconus keratoglobus), corneal dystrophies or degenerations, corneal scarring, and corneal oedema. Patients with prior neurological illness history, such as multiple sclerosis, and those with history of ocular trauma and any issue that arises during surgery were excluded. Patients who met the inclusion and exclusion criteria were recruited from the cataract units of Lahore General and Jinnah Hospitals in Lahore after the study was approved by the hospital's ethical review board. Every patient provided written and informed consent. Every patient had their name, age, and gender collected, among other demographic data. Using specular microscopy, the pre-operative endothelium count was determined. Every procedure was carried out by a single, skilled surgeon who has completed at least 500 separate surgeries in order to prevent bias. As the final stage of phacoemulsification, each patient received 0.1 mL of intracameral moxifloxacin 0.5% ophthalmic solution, which included 500 µg of moxifloxacin. Using specular microscopy, we were able to observe the impact of moxifloxacin in 80 patients whose postoperative 1-month corneal endothelial cell count had been evaluated. SPSS version 24.0 was used to enter and analyze all of the data. quantitative factors expressed as mean standard deviation, such as age and endothelial cell count. Frequency and percentage were used to represent qualitative characteristics like effect and gender. Using stratification, effect modifiers such as age (<50 and >50) and gender might be controlled.

RESULTS

Eighty cases that met the inclusion and exclusion criteria were recruited to evaluate the efficacy of moxifloxacin in preventing endophthalmitis in patients having cataract surgery. After the patients' ages were distributed, it was determined that 23.75% (n = 19) were between the ages of 40 and 50, 61.25% (n = 49) were between the ages of 51 and 60, and 15% (n = 12) were older than 60 years. The mean + SD were computed as 53.99 + 6.22 years. The patients' gender distribution revealed that 41.25% (n=33) were female and 58.76% (n=47) were male. The mean endothelial cell count before surgery was determined to be 2776 +177, whereas the mean endothelial cell count after surgery was determined to be 2424 + 72.8 (p-value: 0.385)(Table 1).

Table 1: Change in the endothelial cell count before and after cataract surgery using intracameral moxifloxacin

Age (years)	Endothelial Cell Count (cells/mm^2)		p-value
	Pre-Operative	Post-Operative	
< 50	2841 ± 187	2591 ± 102	0.451
≥ 50	2678 ± 152	2387 ± 76.5	0.513
Total	2776 ±177	2424 ±72.8	0.385

The percentage of patients who experienced a moxifloxacin-related endophthalmitis prevention after cataract surgery was found to be 22.5% (n = 18), whereas 77.5% (n = 62) showed no moxifloxacin-related endophthalmitis prevention after cataract surgery (Table 2).

Table 2: Frequency of effect of moxifloxacin, in prevention of endophthalmitis in patients undergoing cataract surgery(n=80)

Endophthalmitis Prevention	No. of patients (%)
Yes	18 (22.5)
No	62 (77.5)
Total	80 (100)

The age-based stratification of the moxifloxacin impact in preventing endophthalmitis in patients undergoing cataract surgery is given in Table 4. Of the 18 cases that showed endophthalmitis reduction, 7 patients were younger than 50 years old, and 11 patients were older than 50 (Table 3). A gender-based stratification of the effectiveness of moxifloxacin in preventing endophthalmitis in patients following cataract surgery revealed that of the 18 cases, 61.11% (n = 11) were male and 38.89% (n = 7) were female (Table 3).

Table 3: Stratification of effect of moxifloxacin, in prevention of endophthalmitis in patients undergoing cataract surgery with regards to age and gender(n=18)

Variables		No. of patients (%)
Age	<50	7 (38.9)
	≥50	11 (61.1)
	Total	18 (100)
Gender	Male	11 (61.1)
	Female	7 (38.9)
	Total	18 (100)

DISCUSSION

One of the most dreaded side effects of contemporary cataract surgery is still endophthalmitis. Between 0.03% and 0.4% of cases have surgical endophthalmitis. Endophthalmitis can arise for a number of reasons, although the precise pathophysiology of endophthalmitis following cataract surgery is uncertain [16-20]. Many prophylactic treatments, such as the use of topical, subconjunctival, and intracameral antibiotics, are used to prevent endophthalmitis. Other preventive measures, such as the use of povidone-iodine 5%, watertight wound architecture, injectable IOL, etc., are also employed [9,15]. For obvious reasons, moxifloxacin 0.5% has been used most frequently in preventive late-stage regimens. To better understand the dynamics at play and provide strategies for preventing endophthalmitis, a risk factor for blindness, the current study was designed to ascertain the impact of intracameral moxifloxacin on endothelial cell count in our setup. In this study, the mean + standard deviation was calculated as 53.99 + 6.22 years, with 23.75% (n = 19) between 40 and 50 years old, 61.25% (n = 49) between 51 and 60 years old, and 15% (n = 12) older than 60. Pre-operative mean endothelial cell count was calculated as 2776 +177, while post-operative mean endothelial cell count was calculated as 2424 + 72.8. The frequency of moxifloxacin's effect in preventing endophthalmitis in patients undergoing cataract surgery was recorded as 22.5% (n = 18) and 77.5% (n = 62) of patients had no moxifloxacin in their treatment regimen. The study's results are consistent with a study conducted by CRG. Espiritus at the American Centre in Manila, Philippines, to assess the impact of intracameral moxifloxacin on endothelial cell count. The mean endothelial cell count of all 65 eyes was 2491.52 cells/mm2 preoperatively and 2421.58 cells/mm2 postoperatively [14]. At 70 cells/mm2, the mean difference is not statistically significant (p<0.737). It was a 3% mean reduction. Preoperative and postoperative mean endothelial cell counts in our investigation were not statistically significant, nor was the frequency of impact higher. The goal of this study is to prevent the disastrous consequences of intraocular infections. Moxifloxacin is a useful addition to our toolkit for the prevention and treatment of bacterial endophthalmitis because of its simple administration, broad antibacterial range, safety, excellent penetration into the anterior chamber, and constant levels. Surgeons frequently employ topical antibiotics after surgery to lower the incidence of endophthalmitis, however, there is not enough information to support this practice. Due to the low incidence of problems that could endanger vision, routine patient reviews on the first postoperative day are not required after straightforward cataract surgery. On the other hand, patients who have undergone complex cataract surgery, surgery on an eye that already has a co-existing condition (such as glaucoma or uveitis), surgery on a single eye, or who do not have easy access to eye services should have a review on the first day.

CONCLUSIONS

We found that there is no discernible increase in the effectiveness of moxifloxacin in preventing endophthalmitis in patients having cataract surgery, however, it is safe to use in our setup.

Authors Contribution

Conceptualization: SR, UH,
Methodology: SR, SJ, IR, AJ
Formal analysis: SJ, IR, AJ
Writing-review and editing: SR, SJ, IR, AJ, UH

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

Social Support, Social Isolation, And Quality of Life Among Patients with Hepatitis A, B, And C

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ABSTRACT

Hepatitis is a group of viral infections that affect the health and social life of an individual. **Objective:** To explore the association and the role of perceived social support, and social isolation, and their impact on quality of life among patients who have hepatitis type A, B, and C. **Methods:** A total of 500 participants were taken from the different areas urban and rural areas of Faisalabad. The participant's age ranges were between 18 to 55 years. The sample consisted of married participants (n=355, 71%) and unmarried were (n=145, 29%). A further sample was classified into hepatitis A (n=50, 10%), B (n=225, 45%), and C (n=225, 45%). A purposive sampling technique was used to collect the data. The following measures were used to assess the findings i.e., Demographic Form, Social Disconnectedness Scale, Multidimensional Scale of Perceived Social Support, and World Health Organization Quality of Life-BREF scale was used to assess the quality of life. **Results:** The analyses reveal that patients with type C of Hepatitis are significantly different on the Social Disconnectedness Scale and the subscales of friends and family are significantly different on the Multidimensional Perceived Social. Furthermore, Analysis of Variance showed that there was a significant difference on each subscale of the World Health Organization Quality of Life-BREF among patients with Hepatitis A, B and C [$p<0.01$]. **Conclusions:** It was concluded that social isolation negatively influences patient's quality of life, the social support plays a vital role in improving patients' quality of life.

INTRODUCTION

Hepatitis is one of the health issues all over the world. It has diverse results on patients' lives [1]. Chronic viral hepatitis infects with regards to four hundred million individuals globally and every year causes one million deaths due to infectious liver disease [2]. Clinically, individuals with the infectious disease have a high threat of liver injury, approximately four-hundredth of infected patients finally experience cirrhosis of the liver, liver collapse, or malignant hepatoma throughout the way of viral hepatitis B virus (HBV) infection. The viral hepatitis C virus is the most significant worldwide reason of liver infection, liver injury, and liver morbidity [3]. Viral hepatitis A and B are largely spread out by impure food and water. Viral hepatitis C is generally sexually transmitted, however may even be passed from mother to baby throughout birth [4]. Each viral hepatitis B and viral hepatitis C is typically spread out through contaminated blood and might occur through needle sharing by endogenous drug users [5]. Hepatitis C and B viruses, or HCV and HBV, are two of the main causes of severe liver disease, which includes end-stage liver disease linked to cirrhosis and hepatocellular carcinoma [6]. According to estimates from the World Health Organization (WHO), 170 million people globally have chronic HCV infection and 350 million people have chronic

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HBV infection [7]. Pakistan is one of the most severely affected countries due to its enormous population (165 million) and intermediate to high rates of infection [8]. In the developed world, HCV accounts for two-thirds of liver transplants and 50–76 percent of cases of liver cancer [9]. Hepatitis B-related liver cancer mostly affects immigrants from nations with high hepatitis B endemicity, while hepatitis C virus infection is the main cause in most Western countries [10]. Most poor nations have a high burden of hepatitis B virus (HBV) infection due to the virus's widespread distribution, especially in rural areas, and the high expense of treatment, management, and prevention [11]. The incidence of hepatitis differs between nations and occasionally within a single nation's various regions. In several nations in Africa, Latin America, Central America, and South-East Asia, it is high (>2 percent). Prevalence rates ranging from 5% to 10% are commonly reported in these nations. With an estimated 16,094,3000 people living there, Pakistan is the sixth most populated nation in the world. The prevalence rate of HCV in Pakistan varies between the four provinces; it is claimed to be 6.7% in Punjab, 5% in Sindh, 1.5% in Baluchistan, and 1.1% in Khyber Pakhtunkhwa [12].

Hence the current study aims to explore the association and the role of perceived social support, and social isolation, and their impact on quality of life among patients who have hepatitis type A, B, and C. Viral hepatitis not only affects the physical health of an individual, it also influences the emotional and mental health of the individuals who have hepatitis. In our society, people usually avoid or hate patients with hepatitis due to their disease and fear of transmission of disease. The current study highlights the importance of perceived social disconnectedness; social support and health-related quality of life among hepatitis patients.

METHODS

A cross-sectional study was conducted and the sample size was calculated using formula N>50+8K. The extracted sample size was n=400 and a total of 650 patients were screened and 500 patients of hepatitis A, B, and C met the study inclusion and exclusion criteria with ages ranging from 25 to 50 years. The sample was collected from different public and private hospitals in Faisalabad through a purposive sampling technique from August 2022 to September 2023. Participants were taken to live alone or with non-blood relations (i.e., roommate, colleague friend, etc.) and they are under treatment. Patients were taken from low- and middle-income groups. Patients with medical and psychiatric comorbidity, and physical and intellectual disability were excluded. Patients with mild, moderate, and severe rage were taken but extremely severe cases were excluded. An in-depth clinical interview was conducted to get a history of the problems/illness. In Social Disconnectedness Scale (SDS) 8 items were designed to assess patients' level of social isolation during illness [13]. It is rated from seldom or never (1) a number of the time (2) and infrequently (3). The scale has acceptable internal consistency, with an alpha of .73 and moderate to strong item-rest correlations. In Multidimensional Scale of Perceived Social Support (MSPSS) Urdu version was used to assess patients perceived social support during the period of illness [14]. MSPSS consists of 12 items which is rated from terribly powerfully disagree (1) to powerfully agree (7). It has three subscales, such as family, friends, and significant other. MSPSS reliability is estimated at .85 to .91 with test-retest reliability at 72 to .85. In World Health Organization Quality of Life-BREF (WHOQL1991) was developed to assess patients' quality of life during illness. It consists of four domains i.e., physical health, emotional health, social relations, and setting. It consists of 26 items. Scale is good reliability, test-retest reliability, and validity. The raw score of each domain was then moved to the standardized score of zero to a hundred, to take care of consistency in scores [15]. Initially, the study protocol was submitted to the Ethical Research Committee (ERC), and the study was approved by the Board of Studies (BOS) final approval was taken from the Institutional Review Board (IBR) on 18-8-2023, Government College University Faisalabad. The researcher briefly described the participants about the purpose of the study. After it informed consent was given to patients and they were asked to read and sign it if you are willing to participate in the study. it was assured the received information will remain kept confidential and you have a right to withdraw from the study anytime, if you feel discomfort. Descriptive statistics and One-Way Analysis of Variance were used on the Multidimensional Scale of Perceived Social Support, Social Disconnectedness Scale, and World Health Organization Quality of Life-BREF among patients with Hepatitis A, B, and C. Statistical Package for Social Sciences (SPSS) version twenty-one were used to perform all analyses.

RESULTS

Findings in table 1, one way analysis of variance showed that there was a significant difference on Social Disconnectedness Scale among patients with Hepatitis A, B and C [F(14.50), p<0.01]

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Table 1: Descriptive statistics and One-Way Analysis of Variance on the Social Disconnectedness Scale (SDS) among patients with Hepatitis A, B and C (N=402)

Variables	N	Mean + SD	SE	MS	F	P	95% CI	
							LL	UL
A	116	38.16 + 7.777	.722	595.075	14.505	.000	36.72	39.59
B	152	37.72 + 7.012	.569	41.025	-	-	36.59	38.84
C	134	34.28 + 3.867	.334	-	-	-	33.62	34.94

Note: p<.05

SS = Sum of Squares, MS = Mean Square

Findings in table 2, one way analysis of variance showed that there was a significant difference subscale of family and friend (p< 0.01). Furthermore, results indicate whether there are statistically significant differences in perceived social support among the groups

Table 2: Descriptive statistics and One-Way Analysis of Variance on the Multidimensional Scale of Perceived Social Support among patients with Hepatitis A, B and C (N=402)

Variables		N	Mean + SD	SE	MS	F	P	95% CI	
								LL	UL
Social	1.00	116	19.79 + 3.38	.31	40.27	3.35	.036	19.16	20.41
	2.00	152	20.00 + 3.42	.27	12.02	-	-	19.45	20.54
	3.00	134	20.84 + 3.57	.30	-	-	-	20.23	21.45
Family	1.00	116	19.87 + 3.60	.33	71.54	5.90	.003	19.21	20.54
	2.00	152	20.04 + 3.08	.25	12.11	-	-	19.55	20.54
	3.00	134	21.23 + 3.77	.32	-	-	-	20.58	21.87
Friends	1.00	116	19.35 + 3.94	.36	96.38	7.43	.001	18.62	20.07
	2.00	152	19.55 + 3.31	.26	12.95	-	-	19.02	20.08
	3.00	134	20.92 + 3.59	.31	-	-	-	20.31	21.54
MPSS	1.00	116	59.02 + 9.31	.86	605.62	8.11	.000	57.31	60.73
	2.00	152	59.59 + 7.57	.61	74.62	-	-	58.38	60.81

Note: p<.05

SS = Sum of Squares, MS = Mean Square, MPSS = Multidimensional Perceived Social Support.

Findings in table 3, one way analysis of variance showed that there was a significant difference on each subscale of the World Health Organization Quality of Life-BREF among patients with Hepatitis A, B and C [p<0.01]

Table 3: Descriptive statistics and One-Way Analysis of Variance on the World Health Organization Quality of Life-BREF among patients with Hepatitis A, B and C (N=402)

Variables		N	Mean + SD	SE	MS	F	P	95% CI	
								LL	UL
phy	1.00	116	20.53 + 3.09679	.2875	172.94	26.98	.000	19.9649	21.1040
	2.00	152	21.23 + 2.28655	.1856	6.409	-	-	20.8704	21.6033
	3.00	134	22.80 + 2.23599	.1931	-	-	-	22.4239	23.1880
	Total	402	21.55 + 2.69070	.1342	-	-	-	21.2934	21.8210
psy	1.00	116	17.31 + 2.83027	.2627	175.41	27.72	.000	16.7984	17.8395
	2.00	152	17.60 + 2.30507	.1869	6.327	-	-	17.2359	17.9747
	3.00	134	19.44 + 2.45430	.2120	-	-	-	19.0284	19.8671
	Total	402	18.1 + 2.67783	.1335	-	-	-	17.8743	18.3994
soc	1.00	116	9.069 + 1.90981	.1773	38.313	14.46	.000	8.7177	9.4202
	2.00	152	9.664 + 1.74517	.1415	2.649	-	-	9.3848	9.9442
	3.00	134	10.17 + 1.15590	.0998	-	-	-	9.9816	10.3766
	Total	402	9.664 + 1.68140	.0838	-	-	-	9.4993	9.8290
Env	1.00	116	23.74 + 3.91012	.3630	202.04	20.13	.000	23.0223	24.4605
	2.00	152	24.46 + 3.06209	.2483	10.036	-	-	23.9764	24.9578
	3.00	134	26.18 + 2.49862	.2158	-	-	-	25.7596	26.6135
	Total	402	24.83 + 3.31568	.1653	-	-	-	24.5057	25.1559
Tot	1.00	116	76.82 + 9.626	.894	2460.5	50.83	.000	75.05	78.59
	2.00	152	79.16 + 6.220	.505	48.404	-	-	78.16	80.15
	3.00	134	85.29 + 4.601	.397	-	-	-	84.50	86.08
	Total	402	80.53 + 7.774	.388	-	-	-	79.77	81.29

Note: p<.05

SS = Sum of Squares, MS = Mean Square, phy= physical health, psy= psychological health, Soc= social relationships, Env= environmental health, Tot= Total, WHOQL=World Health Organization Quality of Life-BREF

DISCUSSION

The finding of the first hypothesis is similar to previous research as negative health outcomes have been linked to perceived social isolation, which is a deficiency in typical human social interaction [16]. Psychological health service users have well-documented issues with social support and isolation [17]. Arising focus on isolation has also been determined by the detection of its high occurrence, and its broad-ranging impacts on physical health and mental health. Three earlier organized reviews have explored the association between social relationships and hopelessness in a common population [18]. One additional review looked at the association between social group and support and early psychosis in people with first-episode psychosis and common population examples but included no prospective studies [19]. Additionally, another finding showed that the relationship between social isolation and quality of life was examined. The results showed that quality of life is significantly and negatively related to social isolation (r= -.273; p< .001). Isolation is one of the foremost vital health problems that has been associated with depression and weakened quality of life among older adults [20]. Though, older adults with a lot of social support were expected to own low isolation and depression [21]. Notably, the support of relatives also as friends will create a big involvement in older adults' well-being [22]. This social organization will offer older adults a way of happiness, because of the importance of rising health and eudemonia problems among older individuals, a variety of studies have been performed to find connected factors connected with the standard of life and health for the individuals [23, 24]. Quality of life that is related to health seems as a big reflection within the care of patients with persistent viral hepatitis [25]. However, whether or not advantages from improved health connected to quality of life that arise once associate antiviral treatment or drugs conclusion compensate for the risks of microorganism decline is an unreturned question [26]. Social support is a vital feature for the health improvement of patients. It helps in development the of psychological comfort and flexibility; whereas a lack of social support poorly affects the patient's improvement [27]. Despite the clinical challenges that treatment with an antiviral drug in patients with chronic infectious disease and co morbidities represents, recent studies specify the fact that treatment is administrated in secure circumstances at patients with chronic infectious disease infection and medical specialty disorders [28]. Furthermore, the findings indicate that health connected quality of life may be a multifactor construct that explains individuals' observations of their physical, emotional, and social performance. Therefore, Health connected quality of life may be a more holistic analysis than medical parameters, principally in chronic ill health during which death is not an instantaneous concern, as a result of it additionally reflects on a patient's sensible health and well-being. Therefore, differentiate the health connected quality of life time of infectious hepatitis patients has suggestion for patient awareness of the requirements for treatment, obedience toward follow-up, the requirement of treatment, and usually management of infectious hepatitis disease [29]. Communication among patients and providers can have a main impact on the supposed and real quality of concern. Relations play a major role in patients' general satisfaction, still as obedience with approved treatment, which might modify health results [30]. Moreover, the findings show that the quality of life has significantly affects among patients with hepatitis A, B and C [F (2,497) = 13.140, $p < 0.05$]. Further, the multiple comparison of patients with hepatitis A, B and C on the variable of quality of life by one-way ANOVA. The findings show that patients with hepatitis A, B and C have significantly different on the variable of quality of life ($p < 0.05$). Patients with viral hepatitis A have higher quality of life than the patients with hepatitis B. And patients with hepatitis B have higher level quality of life than the patients with infectious hepatitis C. Health connected quality of life is significantly affected in chronic hepatitis B virus patients, largely in those with additional severe variety of the infection [31]. Chronic viral hepatitis infection patients have advanced rates of medical specialty disorders than the common population. Chronic viral hepatitis infection is recognized to be related to broken health-connected quality of life [32].

CONCLUSIONS

It is concluded that social isolation negatively influences patient's quality of life, the social support plays a vital role in improving patients' quality of life. Social support is very important for patients with hepatitis A, B, and C regarding management the of infectious diseases. The patients who received support from their family, friends, and other significant sources, have a better quality of life as compared to the patients who did not receive the support.

Authors Contribution

Conceptualization: HI
Methodology: HI, SK, MS
Formal analysis: HI, SK, AU
Writing-review and editing: HI, MGN, SK, MS, AU

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

Prevalence of Body Dysmorphic Disorder in Physically Disabled People

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ABSTRACT

Physically disabled people are only observed by their physical functioning where studies showed that their cognitive functioning has generally been ignored. Body dysmorphic disorder (BDD) is a psychological health condition where the people having this disorder cannot accept their flaws or impairment. The prevalence of this disorder is approximately 2% of the population worldwide. The Quality of life is suppressed who are suffering from this disorder. To maintain their quality-of-life people engage in different physical activities and exercises which help them to overcome problems and they can easily take part in activities of daily living. **Objective:** To identify the prevalence of body dysmorphic disorder among physically disabled persons. **Methods:** The duration of the study was six months (January 2023 to July 2023) with a sample size of 139 calculated from online open-Epi version 3. Non-probability sampling technique was used for this study. Data were collected from three tertiary care hospitals by using a validated questionnaire appearance anxiety inventory scoring. The data were analyzed by SPSS 23.0 software. **Results:** The results extracted through the use of anxiety appearance inventory score was; out of 139 participants, the body dysmorphic disorder was found to be present in 38 participants and absent in 101 participants which constituted 27.3% and 72.7% respectively. **Conclusions:** Body dysmorphic disorder was found in physically disabled patients but persons attending physiotherapy sessions had improved and accepted their condition.

INTRODUCTION

Body dysmorphic disorder is a type of chronic psychological disorder which consists of disability of various functions as well as the quality of life is seriously affected. It is related to obsessive compulsive disorder which sometimes undiagnosed or missed by the healthcare professionals [1]. It can be found at any age but the young and disabled population is mostly affected [2]. The onset of illness is usually between 16 and 18 years and, unless adequately treated, can be long-lasting and very disabling [3]. A person with physical disability has some social issues because people do not accept their presence as a normal human being because they are not as normal as the healthy person. Some of the physical disabilities that affect the gait pattern of a person, hearing issues, and alteration of vision can cause a seriously noticeable behavior in society [4] Worldwide the prevalence rate of body dysmorphic disorder is between 1.9 to 2.2 percent. As reported in a study the prevalence rate of Body dysmorphic disorder is more in female's 14.8 percent as compared to male's 6.8 percent [5]. A condition in which the ability of an individual's function, performance, endurance, and activity of daily living is disturbed due to damage in the physical structure of the body is known as physical disability [6]. Physical disability includes gait problems, hearing issues,

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vision problems, long-term pain, and lethargic issues. It also includes impairments of musculoskeletal and neurological systems like muscular dystrophy, degenerative changes, problems of the back region, paralysis of all four limbs, spina bifida, and the inability to move limbs, either one limb or both limbs [7]. It provides a detailed vision of the physical appearance that appeared in the self-actualization of an individual that is dependent upon the performance and the surroundings. A study reported the different aspects of body image that can cause worries to physically disabled people: perception, mental, behavioral, and affective [8]. Hence those people who faced any type of impairment feel embarrassed, hopeless, and have negative self-perception. Basically, disability causes functional limitations that obstruct their activities of daily living [9]. Disability is a common problem in the general population because they are not able to take part in daily activities due to their body impairments [10]. Majority of the population can face psychological, physical, behavioral, and social issues. The self-reported score which can be used to assess the behavior and mental status of an individual known as the Appearance Anxiety Inventory [11]. This scale can provide the features of an individual's personality like body shape, concentration, and the factors which impact one's personality in the surroundings, etc. This scale is world widely used to evaluate the severity of body dysmorphic disorder and the treatment outcome [12]. The main treatment outcome for BDD is to provide self-body awareness in the patients. Helping them to change their point of view related to their body physics, social interactions, general appearance, and thinking of people regarding their confidence and behaviors [13]. Mostly observed that the person is socially isolated this can cause a bad impact on their recovery [14]. Confidence in one's own worth or abilities Self-esteem impacts your decision-making process, your relationships, your emotional health, and your overall well-being [15]. It also influences motivation, as people with a healthy, positive view of themselves understand their potential, and self-worth is determined mostly by our self-evaluated abilities and our performance in one or more activities that we deem valuable [16].

The purpose of our study is to determine the frequency of body dysmorphic disorder in correlation to Appearance anxiety score in physically disabled people. Body dysmorphic disorder exists in people without any disability.

METHODS

A cross-sectional study was done in which non-probability purposive sampling technique was used. The study was conducted across 3 physical therapy OPDS of (Dr. Ziauddin Hospital, Patel Hospital, Advanced Orthopedic Reconstructive Clinic) in Karachi between the duration of January to June 2023. There were 139 sample sizes which were calculated by the Open-Epi software. The Ethical approval was taken prior to the initiation of the study by the research committee of AORC with a reference no: 054160/physio.2 Jan 2023. The inclusion criteria were physically disabled patients who attend the physical therapy sessions during the study duration, physically disabled patients who are dependent, and patients with the following disability: Polio, paralysis, adult CP, amputee, fractures, and leg length discrepancy were included. Normal healthy individuals, persons having any psychological issues and the patients who are not willing to participate in our study were excluded. The data was collected through a validated questionnaire named Appearance Anxiety Inventory Scale [17]. AAI is consisting of ten questions in which the measurement of cognitive function and behavior characteristics related to body appearance was assessed in addition to this it can be used to diagnose Body Dysmorphic Disorder and can correlate the symptoms with the effect of treatment outcome. If the score of the participants was AAI>. =20 the participants might have or not have BDD but they were at a high risk of clinical problems i.e. the body dysmorphic disorder if present might be very severe. And if the score was AAI<20 the participants might or might not have body dysmorphic disorder but the risk of severity was at low risk [18]. The statistical analysis was done through SPSS version 23.0 in which prevalence of body dysmorphic disorder was assessed.

RESULTS

There were 139 research participants was included in our study from which 76(54.67%) was male and 63(45.32%) was female. The age group was in between was ≤ 20 to ≥ 50 in which the highest number of participants 48(34.53%) was found in ≤ 20. The other demographic characteristics of participants are shown in table 1.

Table 1: Demographics of research participants

Demographics characteristics	Frequency (%)
Gender	
Male	76 (54.67%)
Female	63 (45.32%)
Age of Participants	
≤20	48 (34.53%)
21-30	36 (25.89%)
31-40	29 (20.86%)
41-50	21 (15.10%)
≥ 51	5 (3.59%)
Marital status	
Married	42 (30.21%)
Unmarried	71 (51.07%)
Divorced	19 (13.66%)

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Widow/widower	7 (5.03%)
Education	
Literate	95 (68.34%)
Illiterate	44 (31.65%)

The response of the AAI score after the data collection from 139 research participants was found to be 41(29.5%) ≥ 20 of AAI score which means they were at high risk for BDD, and 98 (70.5%) were lie in < 20 of AAI score as shown in figure 1.

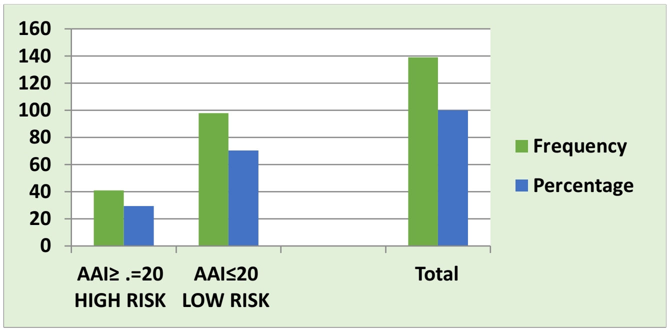

Figure 1: Anxiety appearance inventory score

The cross-tabulation between AAI score and BDD data shows that out of a total of 139 participants, 17 participants i.e. 44.7% were BDD present with an AAI score ≥ 20 which means they were also affected with BDD and had a high risk of clinical problems. Whereas 24 people i.e. 23.8% were indicating the absence of BDD but with a high AAI score ≥ 20 showing that BDD has not yet developed but the participant is at a high risk of developing clinical problems. On the other hand, of 21 participants 55.3% were diagnosed with BDD present but an AAI score of <20 indicated that although they are present with BDD their condition is not very severe. Also, 77 people i.e76.2% were BDD absent and also had an AAI score <20 indicating that they don't have BDD and not even have a high risk to develop any clinical problem. As a summary, 41 people i.e. 29.5% had an AAI ≥ 20 having a high risk of developing clinical problems among which 17 were BDD present and 24 were BDD absent. And a total of 98 were having a score AAI<20 among which 21 were BDD present and 77 were BDD absent. The results are significant among those who scored AAI ≥ 20 and had BDD present and also significant among those who scored AAI<20 and BDD was absent as shown in table 2.

Table 2: Correlation of BDD and AAI score

Parameters			BDD		Total	p-value
			BDD present	BDD absent		
AAI SCORE	AAI ≥ 20 HIGH RISK	Count	17	24	41	0.016
		%within BDD	44.7%	23.8%	29.5%	
	AAI <20 LOW RISK	Count	21	77	98	
		%within BDD	55.3%	76.2%	70.5%	
Total		Count	38	101	139	
		%within BDD	100.0%	100.0%	100.0%	

DISCUSSION

This is the baseline study conducted in physical therapy OPDs for finding the prevalence of body dysmorphic disorder in physically disabled people. The results of our study showed the associated symptoms affected persons had shown decreased body dysmorphic disorder associated symptoms. They had improved their functional impairments and quality of life after taking sessions of physiotherapy treatment. In comparison to this, a study reported as there is a strong association between depression and body dysmorphic disorder because symptoms of both are related to the disability [19]. In our study, positive attitudes of impaired persons showed the benefits of exercise and treatment procedures that they have gained confidence and are eager to learn the substitutes for their daily functioning as compared to this the study reported, the treatment-wise improvement of their impairments is reported which shows that Cognitive Behavior Therapy is better to reduce the severe symptoms as compared to psychotherapy [20]. In another research symptoms of depression are reduced through cognitive behavioral therapy like improvement in functional disability which in turn improves quality of life [21]. In our study, the AAI score is greater than and equal to 20 in 29.5% of participants which means they have a high risk of severity of symptoms as compared to the remaining 70.5% participants. A study related to the correlation between drug abuse and body dysmorphic disorder reported as anxiety and drugs both can cause depression but the major reason for depression in both of them is unclear [22]. while in our study the result of correlation between the anxiety appearance inventory score and the prevalence of body dysmorphic disorder shows 41(29.5%) patients had an AAI ≥ 20, having a high risk of developing disorder, and 98(70.5%) were having a score AAI<20 where body dysmorphic disorder was absent. Among 17 participants BDD is present but according to AAI score ≥ 20 HIGH RISK counts they have severe clinical issues. As compared to this AAI <20 LOW RISK results show 21 participants have the presence of BDD and they have mild clinical issues. So physically disabled people who were attending physiotherapy sessions had improved in different aspects of life i.e., physically and psychologically. While working on their impaired parts they accepted their flaws (disability) and adapted to a new lifestyle. In our study, 38 people out of 139 had body dysmorphic disorder. There were very few people who wanted to change their appearance or who were upset about their condition. When discussing their issues, the majority of the population was concerned about their past but they have accepted their future. This proved that attending clinics had brought acceptance in their lives with improvement and adaptation of their impairments showing a positive outcome.

CONCLUSIONS

It is concluded that the physically disabled patients who visited the department of physical therapy should be evaluated and treated through the counseling sessions of physical therapy with a qualified physical therapist in the future because PT can play a vital role in improving the self-esteem and confidence of those people who were physically disabled or challenged. Physical therapy cannot recover the damaged limbs but it helped them to live with the disability by guiding and teaching the correct way of performing Activities of daily living. Besides that, physical therapy exercises also release certain hormones in the blood which can decrease depression and improve the mood and mental health of the patients.

Authors Contribution

Conceptualization: FT, EURKG
Methodology: FT, EURKG, MA, LSA, SAW
Formal analysis: FT
Writing-review and editing: FT, EURKG, MA, LSA, SAW, GF, SRB

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

Prevalence and Stratification of Polyvascular Disease in Acute Myocardial Infarction Patients: A Cross-Sectional Study at Mayo Hospital, Lahore

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ABSTRACT

Polyvascular Disease, that encompasses peripheral artery disease and cerebrovascular disease, has gained prominence due to expanded clinical focus and research, primarily driven by its association with major adverse cardiovascular events (MACEs) like myocardial infarction, cardiovascular death, and ischemic stroke. **Objective:** To determine the patients of PVD in patients with acute myocardial infarction (AMI). **Methods:** A cross-sectional study was designed and conducted at Department of Cardiology, Mayo Hospital, Lahore. between August 3, 2022 and February 2, 2023. 183 patients with AMI of either gender, age above 25 years and up to 80 years were included. Data were analyzed statistically using SPSS version 25.0. **Results:** Our study reported PVD in 57.4% of the patients with AMI. According to the stratification of PVD with numerous variables, notable variations emerged concerning age and symptom duration ($p<0.05$), whereas gender, BMI, type of AMI, and socio-economic status showed insignificant differences. **Conclusions:** Our findings demonstrated that the PVD was highly prevalent among patients with AMI.

INTRODUCTION

Polyvascular Disease (PVD) is a widespread ailment that has gained attention due to the recent extension of clinical and research efforts to encompass non-coronary atherosclerosis, particularly peripheral artery disease (PAD) and cerebrovascular disease (CVD) [1, 2]. Major adverse cardiovascular events (MACEs), a composite end objective that includes myocardial infarction (MI), cardiovascular death, and ischemic stroke, are the main reasons why PVD is relevant [3]. Extracardiac vascular bed atherosclerotic involvement is common and is thought to be a sign of systemic atherosclerosis, which raises the risk of further ischemic episodes [4, 5]. Over years, atherosclerotic plaques progressively develop. The buildup of saturated fat and low-density lipoprotein cholesterol in the intima, or inner layer, of blood arteries is where they start [6]. Leukocyte adherence to endothelium, inflammation, and penetration into the intima, where they gather lipids and transform into foam cells, occur next. Rich

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sources of pro-inflammatory mediators can be found in foam cells. A fatty streak is the term for the lesion up to this point, which may be somewhat reversible. Smooth muscle cells migrate from the media throughout subsequent evolution, proliferate, and deposit extracellular matrix, which includes elastin fibres, interstitial collagen, and proteoglycans[7]. Apoptosis is seen in some of the smooth muscle cells in advanced plaques. As plaques progress, calcified patches frequently appear. The plaque first develops as the artery remodels itself from the outside in, then it encroaches on the arterial lumen [8]. Angina can eventually result from the stenosis's ability to restrict flow in situations of elevated demand. Previous research has demonstrated that after an acute MI, NSTEMI patients with PVD have worse in-hospital outcomes [9, 10]. In addition, there seems to be a risk gradient according to the number of impacted arterial beds. Patients who have atherosclerotic involvement in all three arterial beds are at a higher risk than those who only have involvement in two of the beds, while those who only have coronary bed involvement are at the lowest risk [8]. A study found that 25.34% of individuals with acute myocardial infarction (AMI) had PVD [11]. Previous literature reports that only 5.6% of individuals with AMI had PVD [12]. Bhatt *et al.*, reported that 65.5% of patients with AMI had PVD [13]. According to the study performed by Jönelid *et al.*, 13.8% of patients with AMI had PVD [14]. Despite the fact that many research have been conducted globally, there is variation in the findings that are published. The present study was conducted to determine the frequency of PVD in patients presenting with AMI.

METHODS

A cross-sectional study was designed and conducted at Department of Cardiology, Mayo Hospital, Lahore from August 3, 2022 to February 2, 2023. Non-probability consecutive sampling was done. Sample size of 183 was calculated using the WHO sample size calculator using confidence level (1-α) as 95% with absolute precision (d) as 5% and anticipated population proportion (P) as 13.8%.14 Patients of either gender, age above 25 years and up to 80 years, patients with acute myocardial infraction were included. Patients who suffered from sensory aphasia, GCS < 10/15, cardiogenic shock requiring inotropic supports, had a history of previously IHD and any cardiac intervention/CABG/Valve replacement were excluded from the study. After taking permission from the hospital's Ethical Committee, this study was conducted at the Cardiology Department. After informed written consent, all 183 patients were admitted to the Cardiology Ward with acute myocardial infraction on the basis of the clinical and ECG as in operational definition underwent detailed history and examination. Demographic features recorded; included age and gender. PVD was assessed as per operational definition. Conorary Artery Disease (CAD) was labeled as >50% reduction in coronary lumen seen during angiography. Normal ABI values are between 1.00 and 1.40. Abnormal ABI values are 0.90 or less and Peripheral Arterial Disease (PAD) was labelled. The patients were considered having extra-cranial carotid artery if peak systolic velocity (PSV) ≥2.3 m/s and internal carotid to common carotid artery (IC/CC) systolic ratio was more than 4 assessed on Doppler ultrasound. Data were entered and analyzed using SPSS version 25.0. Mean and standard deviation was calculated for quantitative variable like age, duration of AMI and BMI. Frequencies and percentages were calculated for qualitative variables like gender, socio-economic status, type of AMI and PVD. Effect modifiers like gender, age, BMI, socio-economic status, type of AMI and duration of myocardial infraction were studied. Post-stratification, Chi-square test was applied taking p-value ≤0.05 as significant.

RESULTS

In this study, 183 patients with AMI were enrolled. Among these patients, 110(60.1%) were males, while 73(39.9%) were females. Age range in this study was from 25 to 80 years with mean age of 49.19±13.221 years. Majority of the patients 104(56.8%) had ages between 51-80 years, while 79(43.2%) patients had ages between 25-50 years. Mean BMI of patients was 28.6±5.74 kg/m2. Among patients, 56(30.6%) had normal BMI, while 98(53.6%) and 29(15.8%) were overweight and obese respectively. According to type of AMI distribution, 85(46.4%) had STEMI and 98(53.6%) patients had NSTEMI. Mean duration of symptoms was 13.4±2.5 hours. According to duration of symptoms distribution, 58(31.7%) had symptoms for ≤10 hours, while 125(68.3%) had for >10 hours. According to socio-economic status distribution, 68(37.2%) had normal BMI, while 64(35.0%) and 51(27.9%) patients had middle and high incomes respectively. Frequency distribution of these variables is described in Table 1.

Table 1: Frequency of the Demographic Variables for Sample Population (N=183)

Demographic variables	Frequency (%)
Gender	
Male	110 (60.1)
Female	73 (39.9)
Age groups	
25-50 years	79 (43.2)
51-80 years	104 (56.8)

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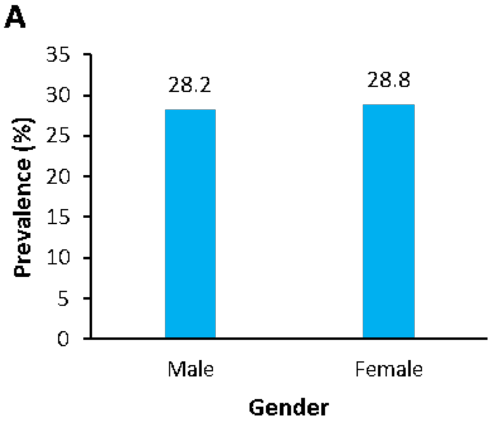
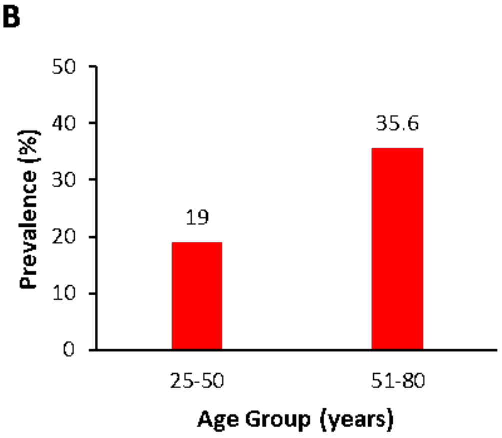
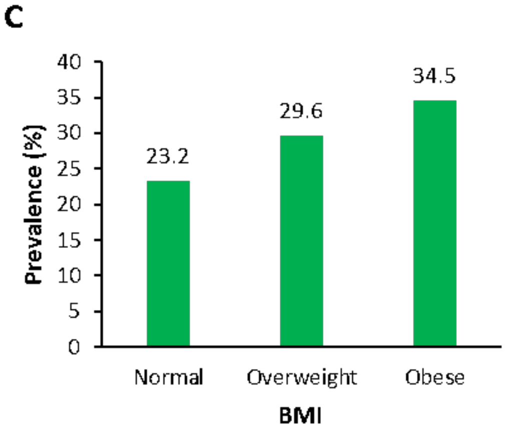
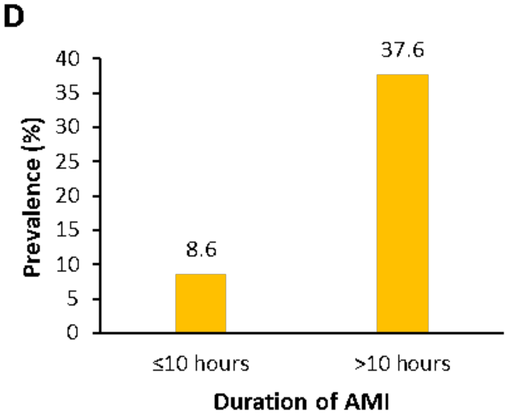
Body mass index	
Normal	56 (30.6)
Overweight	98 (53.6)
Obese	29 (15.8)
Type of AMI	
STEMI	85 (46.4)
NSTEMI	98 (53.6)
Duration of AMI	
≤10 hours	58 (31.7)
>10 hours	125 (68.3)
Socio-economic status	
Low	68 (37.2)
Middle	64 (35.0)
High	51 (27.8)
Poly-vascular disease	
Yes	52 (28.4)
No	131 (71.6)

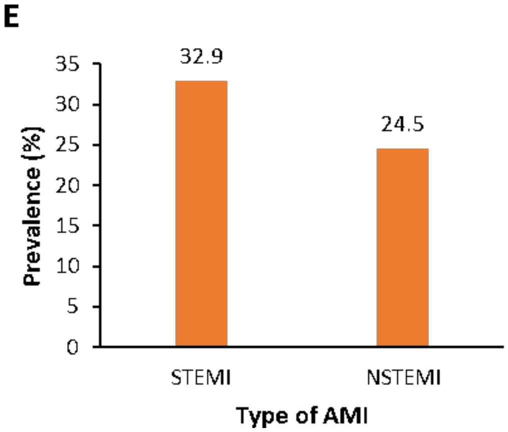
According to stratification of poly-vascular disease prevalence, significant difference was seen in poly-vascular disease with respect to age and duration of symptoms ($p<0.05$), while insignificant difference was seen gender, BMI, type of AMI and socio-economic status ($p>0.05$) (Figure 1).











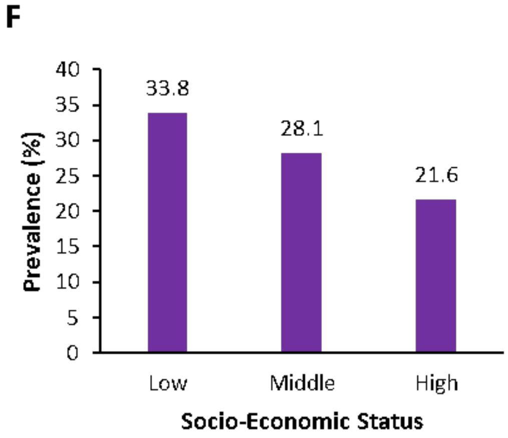


Figure 1: Stratification of the Prevalence of Poly-vascular disease in Relation to Different Variables (A. Gender; B. Age Group; C. BMI; D. Duration of AMI; E. Type of AMI; F. Socio-Economic Status)

DISCUSSION

In the current investigation, PVD was evident in 28.4% of patients who had been sent to our facility for an AMI. The frequency of risk factors of atherosclerosis in different groups, the diagnostic techniques employed, and the population under study all have an impact on the prevalence of PVD.Vidakovic *et al.*, found that 29% of patients with PAD had damage to one vascular region and 71% of patients had PVD in research evaluating the frequency of PVD in PAD patients [16]. It may have resulted from the use of ultrasonography to detect atherosclerosis, which may have identified some patients without any symptoms. Patients with atherosclerosis in one artery region had a 35% increased risk of the illness in one or more other arterial regions, according to the 24-country AGATHA research (A Global Atherothrombosis Assessment) [17]. Suarez *et al.*, conducted a study in Europe that included individuals 45 years of age or older who had at least three predetermined atherosclerotic risk factors, verified CAD, cerebrovascular illness, or PAD. Of these patients, 77% had a single vascular disease and 23% had PVD [18]. More recent investigations have also indicated a similar prevalence of PVD, that ranged from 21.2% to 27.9% [19, 20]. Colette *et al.*, found that 21.7% of high-risk coronary patients had asymptomatic multisite artery dysfunction [21]. PVD was found to be prevalent in 16%, 17%, and 13% of three major clinical trials performed by different institutes and organizations [22-24]. This prevalence was 6% in the Gulf-Race-2 research (2nd Gulf Registry of Acute Coronary Events), although it was only evaluated in individuals who had acute coronary syndrome [12]. Multi-site artery disease, also known as PVD, is common in patients with atherosclerotic involvement in one vascular bed and ranges from 10% to 15% in patients with coronary artery disease to 60% to 70% in patients with severe carotid stenosis or PAD, according to recent joint guidelines of ESC and ESVS (the European Society of Cardiology and European Society for Vascular Surgery), which were supported by the European Stroke Organization (USO) [25]. It is widely acknowledged that atherosclerosis in any arterial region raises the risk of any cardiovascular event, notwithstanding these variations in the frequency of PVD [26]. The fact that PVD was only evaluated in patients with PAD and carotid disea m se, whose frequency is higher than in patients with CHD, may account for the relatively high prevalence of PVD in our study. According to Vidakovic *et al.*, there is a clear correlation between male sex, older age, a BMI of 25 kg/m2 or above, and greater levels of hs-CRP and PVD [16]. Suarez *et al.*, found that the PVD patients tended to be older, had higher rates of diabetes, hypertension, and diabetic nephropathy, and were more likely to be current or past smokers [18]. In the present study, the risk profile of PVD patients depended on the older age and duration of AMI. Our study reported PVD in 57.4% of the patients with AMI. In research by Subherwal *et al.*, 25.34% of patients with AMI had PVD [11]. In the study by Al-Thani *et al.*, only 5.6% of individuals who experienced an AMI had PVD [12]. Similarly, according to Bhatt *et al.*, PVD was noted in 65.5% patients of AMI [13]. Jönelid *et al.*, noted PVD in 13.8% patients of AMI [14].

CONCLUSIONS

According to our findings, PVD was found to be highly prevalent in patients suffering from AMI

Authors Contribution

Conceptualization: AT
Methodology: MAA1, AT
Formal analysis: MAA2, ASHA
Writing-review and editing: MAA1, AT, MAA2, WA, ASH, AS

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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Systematic Review

Prevalence of Parkinson's disease in Pakistan – A Systematic Review

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ABSTRACT

Numerous epidemiological investigations pertaining to Parkinson's disease (PD) have been carried out on a global scale during the course of time. While each research documented an increase in the frequency and incidence rate of PD as individuals age, there were variations in the overall estimations seen across various nations. **Objective:** The purpose of this study is to provide a thorough analysis of PD incidence and prevalence rates in Pakistan. **Methods:** Google Scholar, Medline, and Embase were used to look for studies which reported the incidence of PD around the world. The searches were limited to English-language studies about people that happened between 1965 to 2023. **Results:** A total of 7 studies were conducted on Parkinson's disease in Pakistan. Muhammad Tufail et al. in a cross-sectional study observed a heightened prevalence of Parkinson's disease, with 600 patients identified in Khyber Pakhtunkhwa (KPK). In a cross-sectional study conducted in Lahore, 85 cases of PD were identified within a hospital setting. Fifty cases in a cross-sectional study were conducted at a Hospital in Rawalpindi. Saira *et al.* performed an observational study at Islamabad Hospital and found the prevalence of We estimated the overall frequency of PD in Pakistan was 1016 cases in this systematic review. Males were more diagnosed with PD as compared to females. **Conclusions:** The data from the studies reviewed here indicate that PD increased in Pakistan during the last decade. While males were dominant in this study which is not different from across the globe.

INTRODUCTION

After Alzheimer's disease, Parkinson's disease (PD) is the second most prevalent neurodegenerative illness. James Parkinson first characterized PD in the renowned "Essay on the Shaking Palsy" in 1817. The cardinal indications of Parkinson's disease are all associated with motor dysfunction and consist of resting tremor, bradykinesia, stiffness, and impairment of postural reflexes. Additional presentations include psychological symptoms including worry and sadness, as well as dysautonomic symptoms such as low blood pressure and constipation, abnormal sensations, muscle spasms, impaired sense of smell, and a skin condition called seborrhoeic dermatitis. The manifestation of cognitive decline may become evident as the disorder progresses [1]. Parkinson's disease (PD) is characterized by two pathological features: The substantia nigra pars compacta (SNpc) experiences a reduction in dopaminergic neurons, while misfolded a-synuclein aggregates into Lewy bodies (LBs) in the cytoplasm. Many dopaminergic neurons in the SNpc have already been destroyed by the time patients are initially identified, and neurodegeneration has progressed to other parts of the central nervous system. Most patients' etiology remains unclear, however in 5%-10% of instances, several genetic factors have been shown to be responsible for the illness.

Replacing dopamine is the mainstay of current Parkinson's disease (PD) therapy, while deep brain stimulation (DBS) and other alternate methods are appropriate for advanced stages of the condition. The current therapies provide excellent control of motor symptoms, but they do not stop the disease's development, neurodegeneration, or growing impairment [2]. It is debatable to what extent genes and environmental/lifestyle factors contribute to the pathophysiology of Parkinson's disease. Age is the single biggest risk factor for Parkinson's disease (PD), with a median age at onset of 60 years [3, 4]. Differences in the frequency of characteristics such as coffee use, usage of postmenopausal hormones, and smoking habits may have an effect on the incidence. The frequency seems to be greater in males (1.3 to 2.0 times higher) compared to females [3]. Mitochondrial abnormalities, genomic instability, telomere dysfunction, epigenetic alterations, autophagy-lysosomal systems and the ubiquitin-proteasome and other age-related biological dysfunctions may contribute to neuronal death in this and other neurodegenerative illnesses [5, 6]. Society is greatly impacted by Parkinson's illness.This disease's incidence and prevalence have increased dramatically over the last 20 years, for causes that are still a mystery [7-9]. The impact of Parkinson's disease on an individual is profound. The protracted nature of degenerative diseases can extend for decades. The estimated incidence rates of PD in industrialized nations vary from 8 to 18 per 100,000 annually, with a general population prevalence of 0.3%, a 60–80 year prevalence of 1.0%, and an 80+ year prevalence of 3.0% [2]. A diagnosis of Parkinson's disease (PD) affects around one million Americans. However experts predict that 1.2 million new instances of PD will appear by 2030. The number of Americans diagnosed with Parkinson's disease each year approaches 60,000, according to new data [10]. Between 65 and 12,500 cases per 100,000 people and 5 to 346 cases per 100,000 person-years, respectively, are the estimated prevalence and incidence rates of PD in Europe [3]. Approximately 400,000 annually individuals in Pakistan are afflicted with PD [6]. The etiology of Parkinson's disease is complex and includes both hereditary and environmental components, as well as the natural consequences of becoming older. The risk of Parkinson's disease may vary between Asian and non-Asian populations due to differences in genetics and environmental exposures [7].

There has been little research on Parkinson's disease in Pakistan, and no study has yet looked at the country's general prevalence. Thus, the primary goal of this systematic review is to identify the total prevalence of Parkinson's disease in Pakistan.

METHODS

A systematic literature analysis was conducted utilizing the Google Scholar, Medline and EMBASE databases to identify worldwide studies that investigated the frequency rates of PD. The MeSH terms used in the search included "Parkinson," "Parkinson's disease," "Epidemiology," "Incidence," and "Prevalence." The search parameters included the human population, specifically targeting adults, with a need for English language publications spanning from 1965 to 2023. Additionally, a comprehensive search was conducted to identify the citations of the included works as well as published pertinent reviews. Studies with clear diagnostic criteria, population-based studies, case-control studies, and hospital-based studies with Pakistani people over the age of 18 were all considered. Cross-sectional studies that showed the incidence rates of PD were also included. The things that were ruled out were: similar publications(in this case, more complete, thorough, and reliable sets were chosen); data that was used in more than one study; nursing homes and social welfare homes for the old; and diagnostic criteria that were not clear or common. Geographical area of study, diagnosed cases, gender, age, type of study, source of study and publication year were extracted from the studies. The diagnostic evaluation, research design, response rate, and sample size were the four main criteria used to systematically assess the quality of all relevant studies.

RESULTS

From the databases of Google Scholar, Sciencedirect, PubMed, and Embase, a grand total of 214 citations were found during our first search. Following the removal of irrelevant or incomplete entries and duplicates, 85 records were left. The incorrect methodology and findings led to the exclusion of 35 further publications. Figure 1 shows that 27 records were eliminated after further full-text assessment according to the inclusion and exclusion criteria.

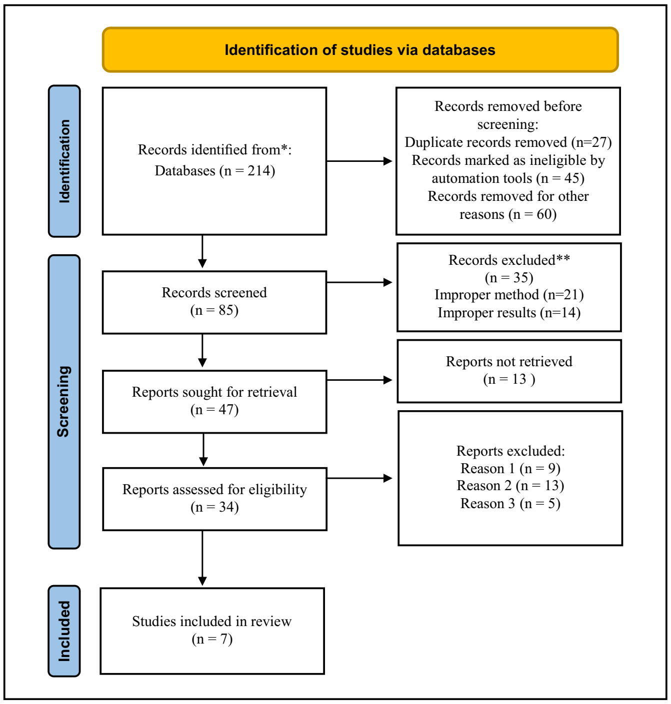

Figure 1: Flow diagram of study identification. Reason 1: Not based on Pakistan; Reason 2: overlapped data in different studies; Reason 3: conducted in unrepresentative population.

This systematic evaluation could include a total of seven records (Table 1). First authors, locations, types of investigations, sources, and publication years of the included studies are detailed in Table 1. The tables also provide the number of diagnosed PD patients. A total of 7 studies were conducted on Parkinson's disease in Pakistan. Muhammad Tufail et al. in a cross-sectional study observed a heightened prevalence of Parkinson's disease, with 600 patients identified in Khyber Pakhtunkhwa (KPK). The male patients were 78% (n=648) while female patients were 22.0% (n=132). The patients' age distribution was categorized as follows: 2.0% (n=12) between 18 and 30 years, 27.0% (n=162) between 31 and 50 years, and 71.0% (n=426) aged 51 and above. The research spanned various cities in Khyber Pakhtunkhwa (KPK) and included Parkinson's disease patients from 12 districts within the region. –". In a cross-sectional study conducted in Lahore, 85 cases of PD were identified within a hospital setting. The average age of the participants was 57.6 years, with the youngest individual being 35 years old and the oldest 77 years old. Notably, the higher prevalence of PD in men, comprising 82% (n=70), compared to women, who accounted for 18% (n=15) of the observed cases ". Examining fifty cases within a cross-sectional study at a Rawalpindi hospital, we found a distribution of 62% (n=31) males and 38% (n=19) females. The age distribution revealed 40% (n=20) within the 48 to 57 years range, 34% (n=17) aged between 58 and 67 years, and 26% (n=13) representing cases above the age of 67 –'. Saira et al. conducted an observational study at Islamabad Hospital, determining the prevalence of Parkinson's disease (PD) among 62 cases. The study revealed an average age of 62 years, ranging from 33 to 80 years. Males constituted the majority(n=46, 74.1%)compared to females(n=16, 25.8%)–. In a hospital setting in Karachi, Khealani reported 80 PD patients. Among these, 63% (n=50) were males and 37% (n=30) were females. The mean age at disease onset was 54 years –. Suliman Khan conducted a door-by-door study, identifying fourteen cases of Parkinsonism. The prevalence of all types of Parkinsonism among individuals aged 50 years and above was 0.55/100, increasing to 1.7/100 among those aged 65 years and above. Specifically for PD, the prevalence among individuals aged 50 years and above was 0.53/100 for males and 0.3/100 for females. Among participants aged 65 years and above, the prevalence rates were 1.31% for males and 1.21% for females . From August 2019 to February 2020, a descriptive cross-sectional research was conducted at Jinnah Postgraduate Medical Centre, Karachi, in the Neuro-medicine Ward. The prevalence of PD was determined to be 70 cases, comprising 44 male and 26 female patients. Of these patients, over 62.86% were between the ages of 50 and 60, while the remaining 37.14% were aged between 61 and 70. The male-to-female ratio was determined to be 1.69:1, suggesting a higher number of males compared to females in the reported instances . In this systematic review, we determined that the overall frequency of Parkinson's disease (PD) in Pakistan was estimated to be 1016 out of them 947(93.2%) patients who visited the hospital while 69 (6.8%) patients were found in door-to-door survery. Our data indicated a greater incidence of Parkinson's disease among men 88.5% (n=900) in comparison to females 11.4% (n= 116).

Table 1: Prevalence of PD disease according to location, type and source of study, and year.

Location	Prevalence of PD (N)	Type of Study	Study Setting	Year	Reference
Lahore	85	Cross-sectional	Hospital	2018	Mukhtar S *et al.*, [12]
KPK	600	Case-control	Hospital	2020	Tufail M *et al.*, [11]
Rawalpindi	50	Cross-sectional	Hospital	2016	Imtiaz N *et al.*, [13]
Islamabad	62	Observational	Hospital	2016	Saad S *et al.*, [14]
Karachi	80	Cross-sectional	Hospital	2006	Khealani BA *et al.*, [15]
Lower Dir & Malakand	14	Cross-sectional	Population	2016	Khan S *et al.*, [16]
Karachi	70	Cross-sectional	Hospital	2022	Moolchandani J *et al.*, [17]

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DISCUSSION

Only seven studies of PD prevalence were found. There were only a few studies conducted on PD disease in Pakistan. In our literature review studies, the total number of PD cases was 1016 patients. Out of 1016, 947 (93.2%) patients who visited the hospital while 69 (6.8%) patients were found in a door-to-door survey. In our systematic review, the lowest prevalence of Parkinson's disease was observed in Lower Dir and Malakand cities, with a reported count of 14 cases, while the highest prevalence was documented in Lahore city, totaling 85 cases. A community survey-based study in Brazil reported similar results in 86 (7.2%) PD patients [18]. Benito-León J et al., did a comprehensive study in Spain, going from door to door, and found a greater occurrence of Parkinson's disease in 1.8% (n=118) out of 6395 people with Parkinson's disease [19]. There is considerable heterogeneity in the worldwide occurrence of Parkinson's disease. There are more reasons that may be attributed to this variation. The discrepancy in prevalence estimates may be due to the disparity in survival rates seen across various countries. One such element that might contribute to the variation in the incidence of illnesses is the use of epidemiological research that depends on medical data. The applicability of this research to the broader population may be restricted since individuals with subclinical disease, who were unlikely to seek medical intervention, were excluded. The existence of undiagnosed Parkinson's disease (PD) in the population may be seen from the data offered by several research using 2-phase door-to-door surveys. These studies have shown a prevalence of PD ranging from 12% to 69% [19-23]. In our systematic review, the PD patients most age group was 50 – 70 years. Previously published literature results are not in agreement with our results. According to one comprehensive analysis, the greatest incidence occurs between the ages of 70 and 79, however this might be due to the difficulties of detecting extremely old people [24]. A recent Italian study conducted a thorough examination of a randomly selected group of 6,000 individuals between the ages of 65 and 84. The study found a much-increased occurrence of a certain condition in these age ranges compared to previous research, with rates ranging from 220 to 670 cases per 100,000 individuals annually. Furthermore, the incidence of this condition doubled between the ages of 75 and 79, as well as between 80 and 84 [25]. An additional study indicated that the occurrence was higher in men. A 1.5-2-fold increase was found in some investigations, with the largest study finding no gender difference [26]. Men with Parkinson's disease (PD) outnumbered women in the majority of the research that we have analyzed here. According to a prior comprehensive analysis, there were 12 994 (41%) fewer women with PD overall than there were males (1800-29%). In fact, the fact that women are less likely to develop PD is one of the most well-documented gender disparities in PD [27]. In all age categories, males had a higher incidence of Parkinson's disease (41.1/100 000 yearly) than women (21.7/10 000 annually), according to Baldereschi et al. 10. This has been verified in further research [28-30]. Furthermore, males are more likely than women to have PD (around 30/10 000 vs 24/10 000, respectively) [30-32]. Men are up to twice as likely as women to get Parkinson's disease (PD), according to some research [33-35].

CONCLUSIONS

This research reviewed clinical studies investigating PD prevalence. According to the statistics analyzed here, Pakistan has shown an upsurge in PD during the last ten years. Nonetheless, the study's predominant gender was male, which is consistent with global trends.

Authors Contribution

Conceptualization: YAJ,
Methodology: ABK, ASS, SS, YAJ
Formal analysis: ASS, SS, YAJ
Writing-review and editing: HNR, 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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