





GREEN INTERNATIONAL UNIVERSITY

IJHP

INTERNATIONAL JOURNAL OF HEALTHCARE PROFESSIONS

Quarterly Peer Reviewed Journal

ISSN (Print) 3078-3488 *ISSN (Online) 3078-3496* *Volume 1, Issue 2*

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International Journal of Healthcare Professions

Vol. 01, Issue 02

(April-June, 2024)

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Editorial

Open Access

Non-Urgent Visits: A Challenge For Emergency Healthcare Services

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Emergency department (ED), where it is ensured that prompt, unscheduled, continuously accessible and high-quality services are provided to the patients for a plethora of fatal and critical urgencies. 1,2

Emergency Departments (EDs) are operated at the interface between the inpatient and ambulatory sectors of health care as per the requirement. EDs have become highly crowded and this is a recently diversified issue.3,4 All over the world, there are multiple reasons which lead to EDs saturation and has been brought into light by various studies.5,6 It is also noted that there is a numerical rise in non-urgent (NU) cases to EDs which also add up to this problem.6 Non Urgent cases in the EDs are those patients who are not in a life-threatening condition or situation and do not require any rapid care. They could be cared or treated for in any primary healthcare and also a delay in their medical inquiry would not cause negative consequences.7,8

The emergency department serves as a vital link between emergency medical services and the hospital. However, as seen by year-on-year growth in patient numbers, emergency departments are increasingly being chosen as the primary means of access to the healthcare system. Triage refers to the processes used in the emergency department to assess patients' severity of injury or sickness within a short period of time following their arrival, assign priority, and send each patient to the right facility for care.7,9

Congestion of ED has numerous outcomes apart from extended patient wait time, for instance, patient disappointment and dissatisfaction, diminished efficiency of healthcare provider, and most importantly, delay in times to cater chronic patients, resulting in poor consequences.10-12

Enhancement of primary care services are needed. Community awareness to lessen the pressure on EDs are critical components for proper ED usage.

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How to cite this: Hameed S. Non-Urgent Visits: A challenge for emergency healthcare services, International Journal of Healthcare Profession. 2024; 1(2): 1

Original Article

Open Access

Awareness of Digital Eye Strain and Its Effects on the Ocular Health among Young Individuals

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ABSTRACT

Background and Objectives: Digital eye strain (DES) has become a growing concern, manifesting through ocular symptoms such as watery eyes, burning sensations, and redness, as well as asthenopic symptoms such as headaches, dry eyes, and blurred vision. Extra-ocular symptoms include neck and back pain. DES remains prevalent among the younger population due to increased screen usage. This study aims to assess the awareness of DES among high school students and its effects on ocular health. To evaluate awareness levels of DES and its effects on the ocular health of young individuals while educating this demographic about the risks associated with prolonged screen use.

METHODOLOGY: An observational, cross-sectional study was conducted over four months, including 152 high school students aged 13 to 20 years. Data were collected using a structured questionnaire, and statistical analysis was performed using SPSS version 21.

RESULTS: The findings revealed that 27 participants (17.8%) reported changes in their social life due to prolonged screen use. Furthermore, difficulties in maintaining focus were common, with 88 students (57.9%) rarely reporting challenges, 37 (24.3%) occasionally, and 23 (15.1%) frequently. Preventive measures were utilized by some participants 33 (21.7%) took breaks, 61 (40.1%) adjusted screen brightness, and 30 (19.7%) employed blue light filters. However, 28 (18.4%) did not engage in any mitigation strategies.

CONCLUSION: Findings indicate limited awareness of DES among students, emphasizing the need for educational interventions and public awareness programs to mitigate its effects. This would encourage proactive habits and informed decision-making to preserve ocular health in a digital age.

KEYWORDS: Digital eye strain, ocular health, awareness, screen time

INTRODUCTION

The digital revolution has fundamentally transformed how societies interact, learn, and work. Beginning in the 1980s, technological advancements paved the way for devices like computers, smartphones, and e-readers, enhancing accessibility, communication, and convenience. However, this transition has not come without challenges. One major issue linked to the increased use of digital devices is digital eye strain (DES), defined by a constellation of symptoms stemming from prolonged exposure to digital screens.

According to the American Optometric Association (AOA), DES encompasses a range of vision and ocular discomfort symptoms associated with extended use of computers, tablets, smartphones, and e-readers (1).

The ocular symptoms of DES include burning eyes, watery eyes, redness, and discomfort from prolonged screen exposure. Additionally, asthenopia (a condition characterized by headaches, dry eyes, eye strain, and blurred vision) often emerges as a byproduct of excessive screen use (2). Beyond ocular symptoms, DES

How to cite this: Fatima N, Fatima I, Rubab, Shahid A, Zarwa. Awareness of Digital Eye Strain and Its Effects on the Ocular Health among Young Individuals, International Journal of Healthcare Profession. 2024; 1(2): 2-7

has extra-ocular manifestations, including neck pain and back pain, exacerbated by poor ergonomic postures during device use. This is indicative of how prolonged and repetitive screen-related activity has a multi-faceted impact on health (3).

The Vision Council reported that approximately 70% of adults experience at least one symptom associated with DES (4). These findings underscore a growing trend, especially as technological devices have become integral to daily routines, work environments, and education systems. Reports also suggest that children and adolescents are particularly vulnerable due to earlier and extended exposure to electronic devices (5).

Tahir et al. (2022) conducted a cross-sectional survey examining DES among radiologists, identifying female gender, long working hours, and flickering digital screens as prominent risk factors for DES (6). However, data focusing on younger populations, especially school-aged individuals, remain sparse, despite the rising prevalence of devices in education and leisure activities.

The primary purpose of this study is to assess the awareness and understanding of DES among high school students and evaluate the extent of symptoms and their impact on the students' ocular health. The findings aim to bridge knowledge gaps by providing a clearer picture of the effects of prolonged screen time among youth and highlighting strategies employed by this demographic to mitigate these effects.

This study also emphasizes the importance of preventive strategies such as the 20-20-20 rule, regular breaks, screen adjustment, and environmental adaptations in reducing DES. Additionally, by identifying awareness levels, the study aims to foster public health initiatives promoting education and safe screen habits. Given the rapid technological advancements in education and society, raising awareness on this issue holds critical importance for long-term eye health in the younger population.

To contribute to this understanding, this study will explore a range of variables, including screen use patterns, awareness levels, health-seeking behavior related to DES symptoms, and the adoption of preventive strategies. By doing so, it will pave the way for developing community education programs, prevention strategies, and recommendations for interventions to combat the adverse effects of DES among students.

METHODOLOGY

This study employed a cross-sectional, observational design to evaluate awareness and experiences related to DES among high school students in Lahore, Pakistan. The study was conducted over a four-month period following ethical approval and adherence to established research protocols.

The study population included students from Crescent Model High Secondary School, Lahore. Using a convenient sampling method, 152 students aged between 13 and 20 years were recruited. Inclusion criteria encompassed children aged 13-20 years, with daily screen time of at least three hours and a history of using screens for more than two years. Exclusion criteria consisted of participants under 12 years old, those spending less than three hours daily on screens, students without prior screen exposure, and individuals with preexisting ocular conditions (e.g., meibomian gland dysfunction, pterygium, or pinguecula).

Participants were provided with a structured questionnaire to collect demographic data, screen time duration, symptoms related to prolonged screen use, and knowledge of DES and its associated risks. Variables included screen time duration, gender, daily usage duration, and the presence of symptoms like headaches, eye strain, and dry eyes. Statistical analysis was conducted using SPSS version 21. Descriptive statistics were employed for categorical data (frequencies and percentages), while quantitative variables were represented using mean and standard deviation.

RESULTS

In the cross-sectional survey to aware the people of digital eye strain and its effects of ocular health of young population, data was collected from 152 school going students. Maximum respondents i.e. 65.8% students off age 15-16 years and 54,6% were males.

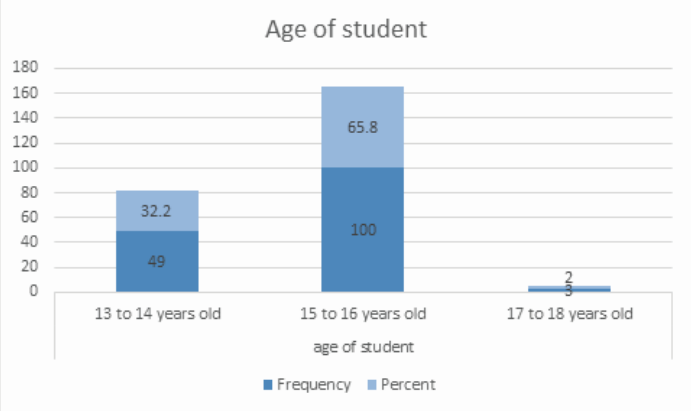


Figure-1: Frequency and percentage of age of participants

Figure shows that 49 (32.2%) participants were of 13-14 years of age group, 100 (65.8%) participants were of 15-16 years of age group and 3 (2%) participants were of 17-18 years of age group. The mean S.D were calculated to be 0.57217.

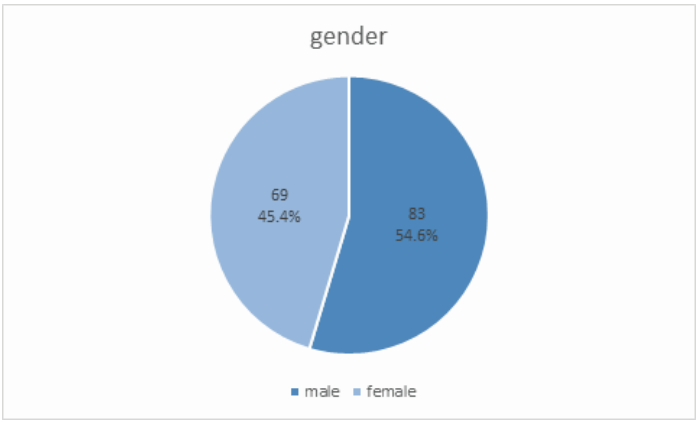


Figure-2: Frequency and percentage of Gender of participants

Figure shows that statistics for gender were 69 (45.4%) participants were males and 83(54.6%) were females.

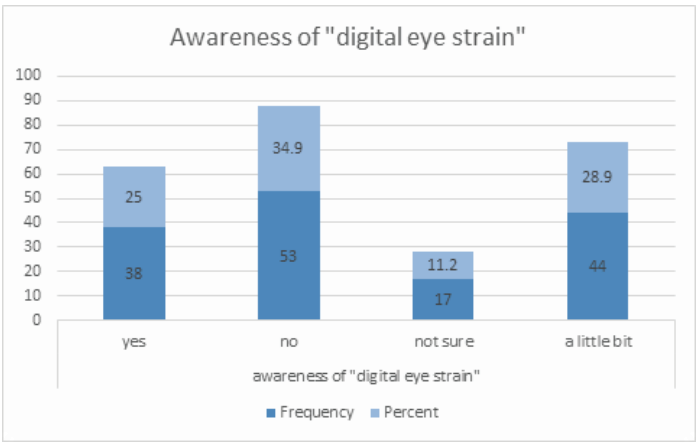


Figure 3: Frequency and percentage of awareness of "digital eye strain"

Figure shows that 38 (25%) participants reported yes, 53 (34.9%) participants reported no, 17 (11.2%) participants reported not sure and 44(28.9%) participants reported a little bit awareness of digital eye strain.

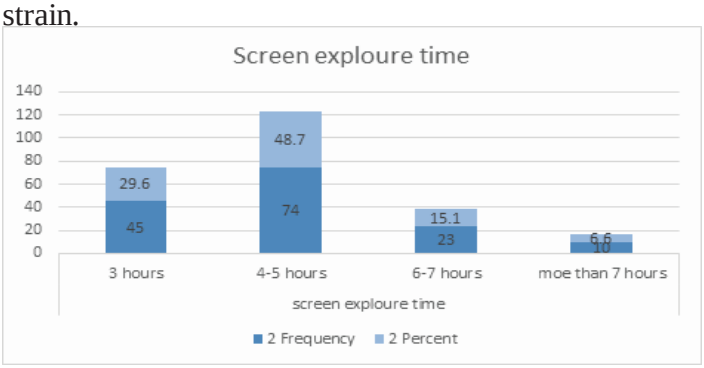


Figure 4: Frequency and percentage of screen explore time

Figure 4 shows that 45 (29.6%) participants reported spending 3 hours per day looking at screens, 74 (48.7%) participants reported spending 4 to 5 hours per day, 23 (15.1%) participants reported spending 6 to 7 hours per day, and 10 (6.6%) participants reported spending more than 7 hours per day.

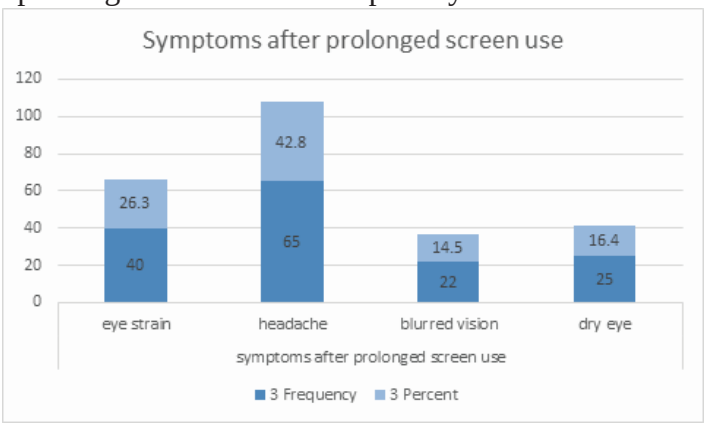


Figure 5: Frequency and percentage of symptoms after prolonged screen use

Figure shows that 40 (26.3%) participants reported experiencing eye strain, 65 (42.8%) participants reported experiencing headaches, 22 (14.5%) participants reported experiencing blurred vision, and 25 (16.4%) participants reported experiencing dry eye after prolonged screen use.

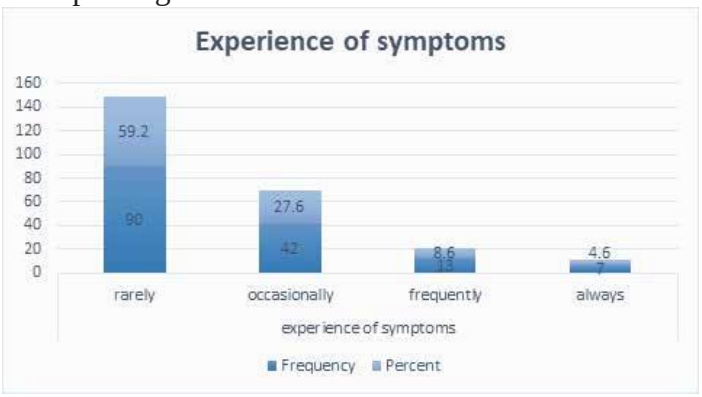


Figure 6: Frequency and percentage of experience of symptoms

Figure shows that 90 (59.2%) participants reported rarely experiencing these symptoms, 42 (27.6%) participants reported occasionally experiencing these symptoms, 13 (8.6%) participants reported frequently experiencing these symptoms, and 7 (4.6%) participants reported always experiencing these symptoms.

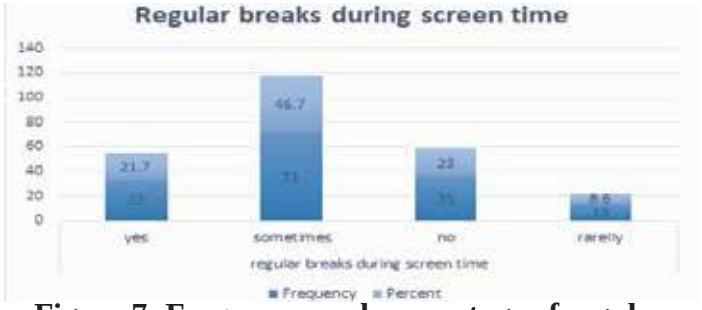


Figure 7: Frequency and percentage of regular breaks during screen time

Figure shows that 33 (21.7%) participants reported yes, 71 (46.7%) participants reported sometimes, 35 (23.0%) participants reported no, and 13 (8.6%) participants reported rarely taking regular breaks when using screens for an extended period.

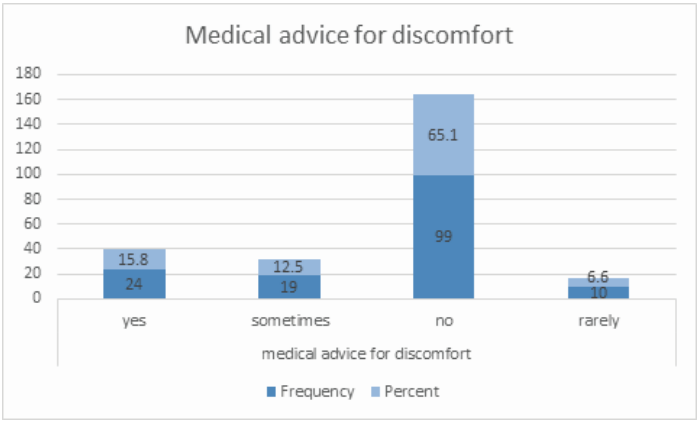


Figure 8: Frequency and percentage of medical advice for discomfort

Figure shows that 24 (15.8%) participants reported yes, 19 (12.5%) participants reported sometimes, 99 (65.1%) participants reported no, and 10 (6.6%) participants reported rarely having sought medical advice or treatment for eye discomfort related to screen use.

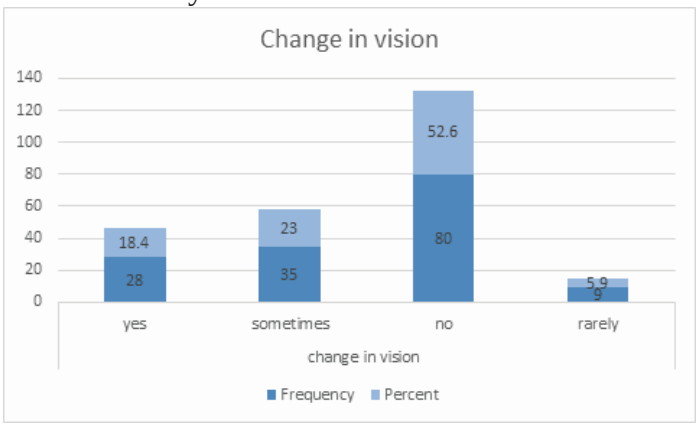


Figure 9: Frequency and percentage of change in vision

Figure shows that 28 (18.4%) participants reported yes, 35 (23.0%) participants reported sometimes, 80 (52.6%) participants reported no, and 9 (5.9%) participants reported rarely noticing any changes in their vision since using screens regularly.

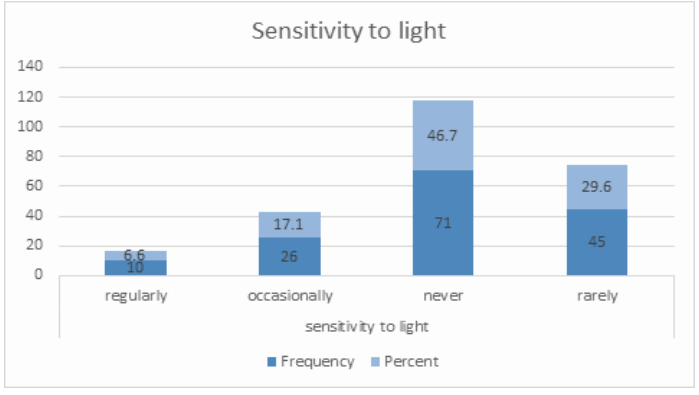


Figure 10: Frequency and percentage of sensitivity to light

Figure shows that 10 (6.6%) participants reported experiencing sensitivity to light (photophobia) regularly, 26 (17.1%) participants reported experiencing it occasionally, 71 (46.7%) participants reported never experiencing it, and 45 (29.6%) participants reported rarely experiencing it during or after screen use.

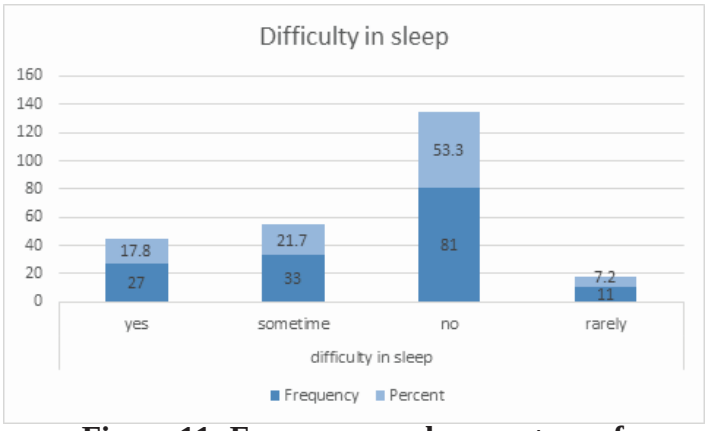


Figure 11: Frequency and percentage of difficulty in sleep

Figure shows that 27 (17.8%) participants reported yes, 33 (21.7%) participants reported sometimes, 81 (53.3%) participants reported no, and 11 (7.2%) participants reported rarely finding it difficult to fall asleep when using screens for tasks that require intense focus.

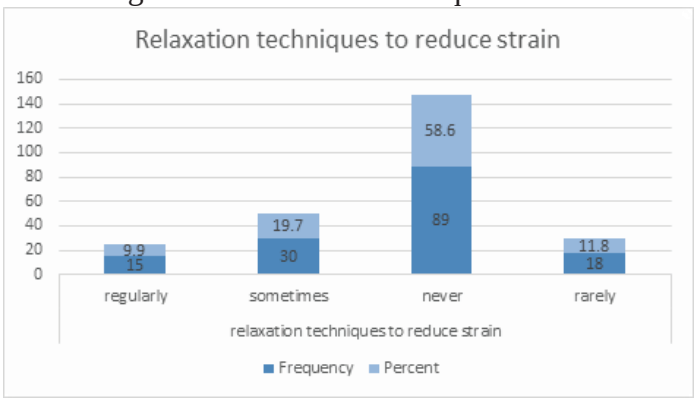


Figure 12: Frequency and percentage of relaxation techniques to reduce strain

Figure shows that 15 (9.9%) participants reported regularly engaging in eye exercises or relaxation techniques to reduce strain from screen use, 30 (19.7%) participants reported sometimes, 89 (58.6%) participants reported never, and 18 (11.8%) participants reported rarely engaging in these practices.

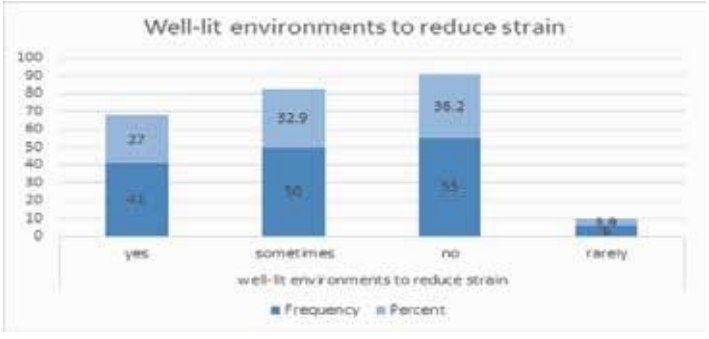


Figure 13: Frequency and percentage of well-lit environments to reduce strain

Figure shows that 41 (27.0%) participants reported yes, 50 (32.9%) participants reported sometimes, 55 (36.2%) participants reported no, and 6 (3.9%) participants reported rarely using screens in well-lit environments to reduce strain on their eyes.

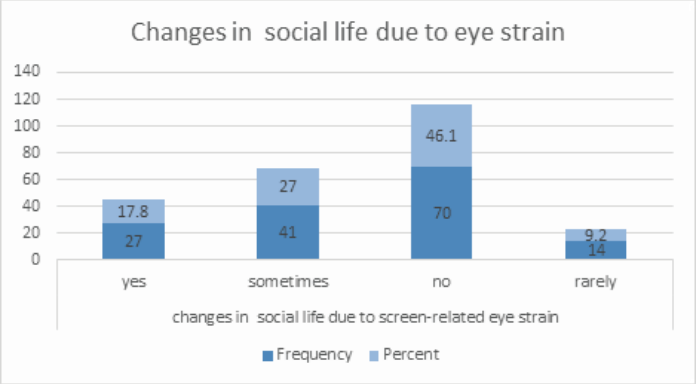


Figure 5.14: Frequency and percentage of changes in social life due to eye strain

Figure shows that 27 (17.8%) participants reported yes, 41 (27.0%) participants reported sometimes, 70 (46.1%) participants reported no, and 14 (9.2%) participants reported rarely noticing any changes in their social life or relationships due to screen-related eye strain.

DISCUSSION

Digital eye strain (DES) is a multifaceted health problem exacerbated by the modern lifestyle, particularly among students who spend extended hours using digital devices. This study explored the relationship between prolonged screen use, awareness levels, and reported symptoms of DES among high school students, revealing insights into the underlying behaviors and knowledge gaps.

Our findings indicate that students experience common symptoms of DES, such as headaches (42.8%), eye strain (26.3%), dry eyes (16.4%), and blurred vision (14.5%). Despite these symptoms, preventive measures were inconsistently adopted. Only 21.7% of students took regular breaks, while 46.7% reported doing so only sometimes. The majority did not utilize eye exercises or environmental changes like ensuring well-lit areas, suggesting a lack of effective preventative strategies.

Studies have shown that ergonomics, including posture correction and adjustments to screen brightness, can reduce symptoms of DES. Proper ergonomic practices, such as maintaining an appropriate distance from devices, proper lighting, and adhering to the 20-20-20 rule, are vital interventions (5). However, our findings indicate poor adoption rates of these practices among the surveyed students.

Similar studies support these findings. For instance, youth in regions with extensive screen exposure exhibit higher rates of DES-related symptoms due to poor screen habits and limited preventive strategies (7, 8). Furthermore, social aspects such as concentration and relationships were also impacted by DES, with 17.8% reporting changes in their social interactions due to these symptoms, aligning with global trends showing psychological effects related to prolonged screen use (9).

The lack of adequate public health education highlights the knowledge gap contributing to this issue. Studies show that awareness campaigns can foster behavior change by addressing misconceptions and encouraging simple, low-cost interventions (10). Proactive measures such as parental guidance, education programs, and technology interventions could substantially mitigate DES risks (11).

Overall, raising awareness and promoting interventions—such as the 20-20-20 rule, regular breaks, and screen modifications—are critical to addressing DES. Our findings emphasize the urgent need for integrated health promotion strategies to combat this modern health problem.

CONCLUSION

This study reveals a significant knowledge gap regarding DES among high school students. Despite experiencing common symptoms such as headaches, dry eyes, and blurred vision, most participants lack awareness of effective preventive strategies. In our increasingly digital world, educational initiatives to raise awareness about the causes and management of DES are essential. Encouraging students to adopt proactive strategies like breaks and adjusting lighting can mitigate these effects. Addressing this issue through community health education may improve ocular health outcomes for the younger population.

- DES is prevalent among students exposed to prolonged screen time.
- Awareness is low, with only 25% recognizing it as a significant health issue.
- Preventive strategies are underutilized.

Comparison with Existing Literature

The findings align with studies reporting that symptoms of DES impact both social and cognitive well-being among youth. Furthermore, DES affects academic performance by impairing focus and concentration, consistent with these findings.

Recommendations

- Implement health education programs to raise awareness about DES.
- Encourage students to adopt the 20-20-20 rule and other ergonomic practices.
- Promote regular medical advice for persistent symptoms.

Limitations

- Study conducted over a short four-month period.
- Limited to students aged 13–20 years, potentially excluding broader demographics.
- Relied on self-reported responses, which may carry biases.

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Authors Contributions:

Nimra Fatima and Izza Fatima: Substantial contributions to the conception and design of the work.

Rubab and Zarwa: Design of the work and the acquisition. Drafting the work.

Amna Shahid: Final approval of the version to be published.

Submitted for publication: 04-04-2024
Accepted after revision: 04-06-2024

Original Article

Open Access

The Effects of Caffeine Intake on AC/A Ratio, Near Point of Convergence, and Reading Speed

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ABSTRACT

Background and Objectives: Accommodation refers to an increase in the convexity of the crystalline lens allowing the eye to change its focus from distance to near objects. It is measured in Diopters. Accommodation can sometimes be excessive, causing the eye to exert more power than needed, which can result in symptoms like eye strain, blurred vision, and headaches. In this study, the effects of caffeine intake on the AC/A ratio, Near Point of Convergence (NPC), and reading speed are evaluated. Caffeine (1,3,7-trimethylxanthine) is the most widely consumed psychoactive stimulant worldwide, commonly found in coffee, tea, energy drinks, carbonated beverages, gums, and cocoa. Its physiological effects are well-documented, including pupil dilation, increased intraocular pressure (IOP), and enhanced accommodation.

METHODOLOGY: A descriptive cross-sectional study was conducted at The University of Faisalabad (TUF) using a convenient sampling technique. The study included 80 emmetropic female, caffeine consumers and aged 18–26 years. Data collection took place between September 2021 and May 2022. The AC/A ratio, NPC, and reading speed were initially assessed in a caffeine-free state. Subsequently, each participant consumed 100 mg of Nestlé black coffee, and these parameters were measured again at intervals of 30, 60, and 90 minutes post-caffeine intake. The AC/A ratio and NPC were quantified by the heterophoric method and the RAF ruler respectively, whereas reading speed was assessed with N10 print. Data analysis was carried out with repeated measures analysis of variance using SPSS version 20.

RESULTS: Among postmenopausal female patients with type 1 osteoporosis, the incidence of sarcopenia was relatively high (90.35%), affecting quality of life in 39.82% of patients, postural instability in 92.21% of patients, and balance in 39.92% of patients.

CONCLUSION: It is concluded that excessive Caffeine consumption has adverse effect on near vision and reading speed. Moreover, it also decreased the amount of AC/A ratio.

KEYWORDS: AC/A ratio, Caffeine, Near Point of Convergence (NPC), Reading Speed

INTRODUCTION

The human eye is a remarkable organ that enables us to see. It is about 2.5 cm in diameter and has three main layers: the fibrous, vascular, and neural layers. These layers surround important components like the crystalline lens, aqueous humor, and vitreous body. (1) The crystalline lens is a clear, biconvex structure that lacks blood vessels and is vital for focusing light onto the retina. Made mostly of water and protein, it accounts for about one-third of the eye's ability to refract light. (2) The lens is held in place by zonular fibers connected to the ciliary body, which allows for accommodation. This ability to adjust is crucial for clear vision, and it is aided by the ciliary muscle, which contracts to lessen the tension on the zonules, making the lens more rounded. (3)

Accommodation refers to increase in the convexity of the crystalline lens allowing the eye to change its focus from distance to near objects. It is measured in Diopters. Accommodation can sometimes be excessive, causing the eye to exert more power than needed,

How to cite this: Nisar H, Amin N, Tariq R, Khaliq N, Siddiqui Y.S. The Effects of Caffeine Intake on AC/A Ratio, Near Point of Convergence, and Reading Speed. International Journal of Healthcare Profession. 2024; 1(2):8-13

Vol. 01, Issue 02, April-June, 2024

which can result in symptoms like eye strain, blurred vision, and headaches. (4) Conversely, accommodation insufficiency occurs when the eye struggles to produce enough accommodative power, often due to aging or health issues such as glaucoma, diabetes, or anemia, leading to challenges with near vision. A key measure of ocular function is the accommodation-convergence/accommodation (AC/A) ratio, which indicates how much convergence is triggered by each diopter of accommodation. Typically, a normal AC/A ratio falls between 3-5 prism diopters for each diopter of accommodation, with variations suggesting potential ocular issues like esophoria or exophoria, depending on whether the ratio is too high or too low. (5) The AC/A ratio can be evaluated using methods such as the heterophoric method, gradient method, and fixation disparity method, and is affected by factors like interpupillary distance and the distance of objects AC/A ratio is calculated by heterophoric method by using the formula in which Δn stands for deviation at near and Δ d stand for the deviation at distance, d is fixation distance in diopters:

AC/A= IPD + Δn-Δd/d.

Convergence, which is the inward movement of the eyes to focus on nearby objects, is another crucial element of visual function. (6) The Near Point of Convergence (NPC) refers to the closest distance at which an object can be seen without experiencing double vision, with a normal NPC range being 7-10 mm. Disorders related to convergence, such as convergence insufficiency and convergence excess, can hinder near vision, resulting in symptoms like blurred vision or double vision when looking at close objects. (7) The NPC can be measured using the Royal Air Force (RAF) ruler, which is specifically designed to evaluate both convergence and accommodation capabilities. Additionally, reading speed is an important factor in visual performance, especially for those who engage in extensive reading tasks, such as students or office workers. (8)

Reading speed is usually measured in words per minute, with a standard rate being around 168 words per minute. The subjects are asked to read Times New Roman print of font size 10. . It can be assessed with stop watch by two methods. We can calculate it by counting the words an individual can read in one minute. It can also be calculated by using the formula. Reading Speed Calculation= (word on page/ second to read) ×60. (9) Several ocular and systemic conditions can impact this speed, such as refractive errors, eye diseases, and health issues like diabetes or hyperten sion. Additionally, environmental factors, including light intensity and glare, can affect how efficiently one reads. (10)

Caffeine, also known as 1,3,7-trimethylxanthine, is a widely consumed psychoactive stimulant recognized for its ability to boost mental alertness, decrease fatigue, and enhance focus. (11) It is commonly found in coffee, tea, energy drinks, and other beverages, with peak levels in the bloodstream occurring 30 to 60 minutes after consumption. The half-life of caffeine in the body typically ranges from 3 to 6 hours. Caffeine works by blocking adenosine receptors in the brain, stimulating the sympathetic nervous system, and raising blood pressure and heart rate. Furthermore, it influences the visual system by altering intraocular pressure, causing pupil dilation, and increasing the effort needed for accommodation, which may lead to changes in visual performance, including effects on the AC/A ratio, near point of convergence, and reading speed. (12), (13)

Numerous studies have indicated that caffeine consumption might have a negative impact on near vision, reducing the ability to focus on close objects and potentially slowing down reading speed. These effects are especially pronounced for those who depend on high levels of accommodation for tasks that require close attention, such as students or office workers. While caffeine is known to enhance cognitive function and alertness, its effects on visual performance, particularly for near vision tasks, continue to be an area of active research. Gaining insights into how caffeine affects these visual aspects could be beneficial for individuals engaged in near work, particularly those with existing visual issues or those who regularly consume large amounts of caffeine.

This study intends to evaluate the influence of caffeine on the AC/A ratio, near point of convergence (NPC), and reading speed in healthy emmetropic females. By assessing these parameters before and after caffeine consumption, the research aims to shed light on how caffeine intake affects visual function and performance during near tasks. The hypothesis posits that caffeine consumption will result in significant alterations in the AC/A ratio, NPC, and reading speed when compared to baseline measurements.

METHODOLOGY

Study Design: Descriptive cross-sectional study design was used to conduct study.

Study Setting: This study was conducted at The University of Faisalabad, Faisalabad.

Study Duration: The duration of study was 8 months

from September 2021 to May 2022.

Population of Study: Female subjects aged between 18-26 years old were included in this study.

Sample Size: 80 healthy female subjects were included.

Sampling Technique: Convenient sampling technique was used in this study.

Inclusion Criteria:

- Only females.
- Age between 18-26 years.
- Healthy emmetropes.
- Caffeine consumers.

Exclusion Criteria:

- All types of refractive errors.
- Ocular diseases.
- Systematic diseases.
- Extra Ocular Muscles (EOM) instability.
- Past ocular surgery.

Data Collection Instruments:

- RAF Ruler (CLEMENT CLARKE OPHTHALMIC)
- Prism Bar
- Millimeter Ruler
- Pen torch (Camelion)
- Log MAR Chart (ASF Universal)
- Trial Box
- Times New Roman N10 Print
- Stop watch

Data Collection Tool: Self-designed examination based Proforma was used.

Data Collection Procedure: Descriptive cross-sectional study design was used to conduct this study including sample size of 80 healthy female subjects selected through convenient sampling technique. Age of subjects was between 18-26 years old. Participants' AC/A ratio, Near Point of Convergence (NPC), and reading speed were assessed in a baseline condition before consumption of 100 mg of Nestle black coffee (containing caffeine). Measurements were then repeated at intervals of 30, 60, and 90 minutes after caffeine consumption. The data was compared before and after 30, 60 and 90 minutes.



Figure-1: Measuring reading speed, NPC, AC/A ratio and IPD

Data Analysis: Data was analyzed through SPSS software version 21 using paired sample T-test and repeated measure ANOVA test respectively. 95% confidence interval was used as standard measure.

Ethical Consideration: Both oral and written consent was taken from subjects prior to study. Subjects were ensured that information provided by them was kept confidential and was used for research purpose only. This information could not be disclosed except in the case where researcher was obliged legally to disclose it. Proforma attached

RESULTS

A descriptive cross-sectional study was conducted at The University of Faisalabad (TUF). 80 healthy emmetrope female subjects aged between 18 to 26 years old were included in this study. Data was collected using convenient sampling technique. AC/A ratio, NPC and reading speed were assessed in decaffeinated subjects. After that, 100 mg of nestle black coffee (containing caffeine) was consumed by each subject and again these parameters were measured at time interval of 30, 60 and 90 minutes of caffeine intake.

Age Distribution: 80 female emmetrope subjects were collected through convenient sampling technique at The University of Faisalabad. The mean age and standard deviation of females were M=20.75 and SD=±1.634. Age distribution of age group of subjects was respectively.

Descriptive statistics of NPC: Descriptive cross-sectional study was conducted at The University of Faisalabad (TUF). 80 healthy emmetrope female subjects aged between 18 to 26 years old were included in this study. Mean value of NPC 7.44 mm with the standard deviation of ±3.434 was recorded in decaffeinated subjects. After caffeine intake the mean value and standard deviation of NPC at 30 minutes, 60 minutes and 90 minutes was (M=8.96, SD=± 3.563), (M=9.11, SD=±3.703), (M=10.27, SD=±4.784) respectively. NPC showed a significant decrease in mean value after successive time intervals.

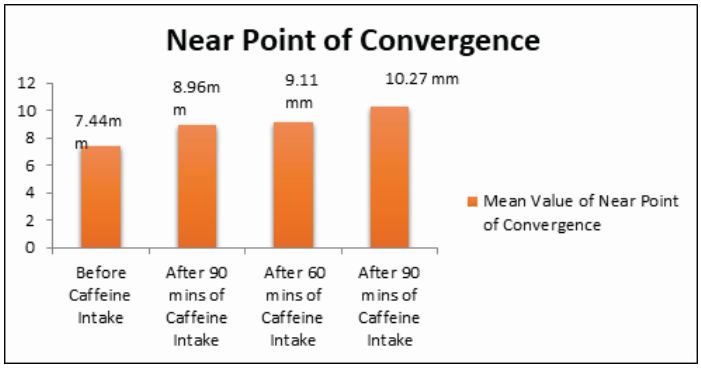


Figure-2: Mean values of NPC before and after caffeine intake

Repeated Measure Analysis of Variance (ANOVA) of NPC: 80 female emmetrope subjects aged between 18-16 years old were taken in this study. Descriptive cross-sectional study design was used and through convenient sampling technique data was collected. Repeated measure ANOVA result showed mean square of sphericity assumed as 108.474 and that of Green-house-Geisser was 145.031. The value of significance level was found to be P=0.000.

Table-1: Repeated Measure (ANOVA) of Near Point Convergence

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Time	Sphericity Assumed	325.421	3	108.474	22.330	.000
	Greenhouse-Geisser	325.421	2.244	145.031	22.330	.000

Descriptive statistics of AC/A ratio: In decaffeinated subjects mean and standard deviation value of AC/A ratio was 4.4445 and ±1.055 respectively. After caffeine intake the mean value and standard deviation of AC/A ratio at 30, 60 and 90 minutes was (M=4.369, SD=±1.117), (M=4.150, SD=±1.117) and (M=4.270, SD=±1.165) respectively. A significant decrease in mean value of AC/A ratio was observed from the mean baseline value respectively.

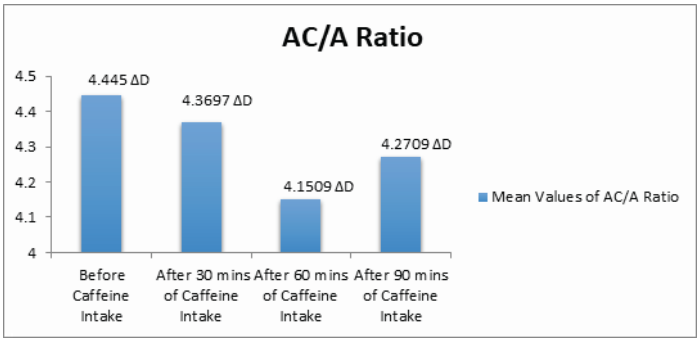


Figure-3: Mean values of AC/A ratio before and after caffeine intake

Repeated Measure Analysis of Variance (ANOVA) of AC/A Ratio: Effect of caffeine over AC/A ratio was assessed on 80 female emmetrope subjects aged between 18-16 years old. Repeated measure ANOVA test was applied on the values of AC/A ratio. The result showed mean square of sphericity assumed as 1.294, and that of Greenhouse-Geisser was 1.630. The value of significance level was found to be P=0.046 respectively.

Table-2: Repeated Measure (ANOVA) of AC/A Ratio

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Time	Sphericity Assumed	3.881	3	1.294	2.948	.034
	Greenhouse-Geisser	3.881	2.381	1.630	2.948	.046

Descriptive Statistics of Reading Speed: Mean value of reading speed 165.50 wpm with the standard deviation ±29.908 of was recorded in decaffeinated subjects. After caffeine intake, the mean value and standard deviation of reading speed at 30 minutes, 60 minutes and 90 minutes was (M=154.40, SD=±23.477), (M=163.04, SD=±25.530) and (M=159.71, SD=±21.772) respectively. Reading speed showed a significant decrease from the mean baseline respectively.

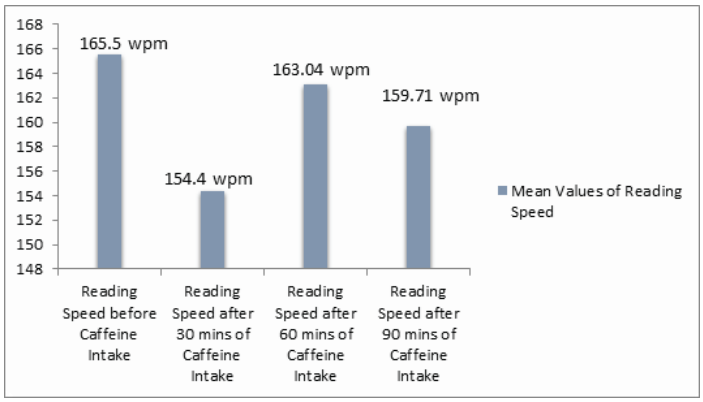


Figure-4: Mean values of Reading Speed before and after caffeine intake

Repeated Measure Analysis of Variance (ANOVA) of Reading Speed: This descriptive cross-sectional study was performed on 80 female emmetrope subjects aged between 18-16 years old. Convenient sampling technique was applied for collecting the sample size. Repeated measure ANOVA test was applied on the values of reading speeed. The result showed mean square of sphericity assumed as 1844.358, and that of Greenhouse-Geisser was 2126.312. The value of significance level was found to be P=0.001 respectively.

Table-3: Repeated Measure ANOVA of Reading Speed before and after caffeine Intake

Source		Type III Sum of Square	df	Mean Square	F	Sig.
Time	Sphericity Assumed	5533.075	3	1844.358	6.224	.000
	Greenhouse-Geisser	5533.075	2.602	2126.312	6.224	.001

This descriptive cross-sectional study was carried out at The University of Faisalabad and involved 80 healthy female emmetropes aged 18-26 years, who were selected through convenient sampling. The objective of the study was to evaluate the impact of caffeine on the AC/A ratio, near point of convergence (NPC), and reading speed before and after consuming 100 mg of Nestle black coffee. The results showed significant decreases in the mean values of NPC (P=0.000), AC/A ratio (P=0.046), and reading speed (P=0.001) after caffeine intake at intervals of 30, 60, and 90 minutes.

DISCUSSION

Descriptive cross-sectional study design was used to conduct this study. 80 healthy female subjects were selected through convenient sampling technique. Age of subjects was between 18-26 years old. This study was conducted in The University of Faisalabad (TUF), Faisalabad in the time duration of September 2023 to May 2024. Only females, emmetropes and caffeine consumers were taken in this study. Subjects with refractive errors, ocular pathologies and systemic diseases were excluded from the study. Informed verbal and written consent were taken from the subjects regarding this study. AC/A ratio, NPC and Reading speed were assessed in decaffeinated subjects. After that 100 mg of nestle black coffee (containing caffeine) was consumed by each subject and again AC/A ratio, NPC and reading speed were measured with a time interval of 30, 60 and 90 minutes. AC/A ratio and NPC were assessed by heterophoric method and using Royal Air Force ruler (RAF) respectively. Reading speed was also assessed by Times New Roman N10 print. Result showed decrease in the mean value of NPC after caffeine intake in successive time intervals (P=0.000). A significant decrease in the value of AC/A ratio was observed after caffeine intake as compared to baseline value (P=0.046). Similarly, reading speed was also decrease from the baseline value (P=0.001) after caffeine intake.

A randomized control trial study was conducted by Odjhimogho in 2019 included 30 emmetropes and non-habitual caffeine users consisting of 15 males and 15 females aged between 19-30 years. The basic purpose of study was near vision assessment by measuring amplitude of accommodation and near point of convergence (NPC) post caffeine consumption. The participants were subdivided into two other groups A and B. 100 mg of caffeine concentration was given to group A and 200 mg of caffeine was given to group B. The value of mean NPC decreased significantly (P<0.05). (14) Current descriptive cross-sectional study consisted of 80 healthy female emmetropes aged between 18-26 years old. Effect of AC/A ratio, NPC and reading speed was assessed before and after 100 mg of caffeine intake. Repeated Measure ANOVA test was applied. The mean value of NPC, AC/A ratio and reading speed showed significant decrease (P=0.000), (P=0.046) and (0.001) from the mean baseline values respectively.

Murari conducted a randomized control, crossover study in 2018 which included 49 normal healthy individuals age above 18 years old. The purpose of assessment was measurement of reading performance, accommodative power, pupil size, choroidal thickness and Tear Break up Time after caffeine consumption. These subjects were given placebo capsules and 200 mg of caffeine and were assessed after 1 hour and 2 hours respectively. The data was statistically analyzed by repeated measure ANOVA. This study showed that reading rate increased significantly after caffeine intake (P<0.05). (15) Current study was conducted by using convenient sampling technique in which 80 female subjects aged between 18 to 26 years old were included. Caffeine consumer subjects were taken to find out the effect of caffeine over NPC, AC/A ratio and reading speed after consumption of 100 mg nestle coffee with time interval of 30, 60 and 90 minutes. The study conducted in 2018 showed an increase in reading performance. Conversely, current study showed a decrease in mean baseline value of reading speed (P=0.001) after caffeine intake. NPC (P=0.000) and AC/A ratio (P=0.046) were also decreased from mean baseline value after caffeine intake.

CONCLUSION

This descriptive cross-sectional study involved 80 healthy female participants and examined how caffeine affects near vision parameters such as the AC/A ratio, NPC, and reading speed. After establishing baseline values for these parameters in subjects who had not consumed caffeine, each participant ingested 100 mg of Nestlé black coffee, and measurements were taken again at 30, 60, and 90 minutes after consumption. The results showed a significant decrease in NPC (10.27±4.784, P=0.000), AC/A ratio (4.2709±1.16512, P=0.046), and reading speed (159.71±21.772, P=0.001) following caffeine intake. These findings indicate that caffeine consumption has a negative impact on near vision and reading performance, leading to reductions in NPC, AC/A ratio, and reading speed. This study concluded that excessive caffeine consumption had adverse effect on near vision and reading speed. Moreover, it also decreased the amount of AC/A ratio.

ACKNOWLEDGEMENT: None
CONFLICT OF INTEREST: None
GRANT SUPPORT AND FINANCIAL DISCLOSURE: None.

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Authors Contributions:

Hadia Nisar: Substantial contribution to the conception, design of the work and implementation
Rabbia Tariq: Survey and design of the work
Nashrah Khaliq: Materials and data collection
Shahan Yamin Siddiqui: SPSS computing tool and drafting for approval of the final version to be published

Submitted for publication: 05-04-2024
Accepted after revision: 06-06-2024

Original Article

Open Access

Effects of Nursing Education Regarding safely directing patients to appropriate levels of care guidelines driven of triage in the emergency service among Nurses

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ABSTRACT

Background and Objectives: Triage in emergency departments is vital for prioritizing patient care, and its effectiveness hinges on the skills and decision-making abilities of nurses. Nursing education is essential in enhancing these competencies, reducing the risk of errors such as over- or under-triage, and ensuring patient safety. Evidence-based education and ongoing training equip nurses to make informed decisions, leading to more efficient and effective emergency care. To determine the baseline knowledge of nurses regarding triage and appropriate level of care before the educational interventions. To evaluate the impact of nursing education on overall emergency department efficiency and improving nurses' triage knowledge and practice.

METHODOLOGY: A cross sectional quantitative study design was used. The study was conducted in a Ali Fatima Hospital emergency department. The study sample consisted of 30 participants emergency nurses (female), randomly assigned to an intervention group (n=30). , involving a pre- test and post-test assessment of triage accuracy among nurses .The intervention group received a comprehensive triage education program, which included theoretical training, practical simulations, and case study analyses.

RESULTS: Triage accuracy was measured using a validated triage assessment tool, with pre-test data collected prior to the educational intervention and post-test data collected one month after the intervention. Secondary outcomes included nurse confidence levels in triage decision-making, assessed via a self-reported questionnaire. The intervention group demonstrated a significant improvement in triage accuracy post-intervention ($p < 0.01$). Additionally, nurses in the intervention group reported higher confidence levels in their triage decisions post-training.

CONCLUSION: The findings indicate that targeted nursing education significantly enhances the ability of nurses to accurately and safely direct patients to the appropriate level of care in a triage setting. This underscores the importance of ongoing education and training programs to improve triage practices and patient outcomes.

KEYWORDS: Nursing education, triage, patient safety, emergency care, triage accuracy, nurses practice.

INTRODUCTION

Triage is a crucial process in emergency care, prioritizing patients based on the severity of their condition. Nurses play a vital role in triage, and their knowledge and skills significantly impact patient outcomes. This study aimed to investigate the effect of nursing education on guideline- driven triage in the emergency service among nurses.The triage in the emergency ward is crucial for prioritizing patient care, ensuring timely intervention for critical cases, and optimizing healthcare resources. Effective nursing strategies are essential for enhancing triage practices, allowing . nurses to accurately assess patients and determine the appropriate level of care [12]. The emergency department is a high-stress environment where patients seek immediate attention for urgent medical conditions. Triage, introduced in the 1960s due to increasing patient ratios, involves categorizing patients based on the severity of their conditions to ensure those with urgent needs receive immediate care [18].

Nurses play a pivotal role in this process, being the frontline professionals responsible for initial patient assessment[8].Nursing education is critical to enhanc

How to cite this: Fiaz A, Atta T, Ghaffar A, Hameed A, Sarwar H. Effects of Nursing education regarding safely directing patients to appropriate levels of care guidelines driven of triage in the emergency service among nurses. International Journal of Healthcare Profession. 2024; 1(2):14-18

ing triage practices. Regular training programs ensure that nurses are equipped with the latest evidence-based guidelines, which not only improve patient care quality but also reduce the risk of adverse events and medical errors[2].

Continuous professional development fosters a culture of excellence and innovation, benefiting both patients and healthcare providers [15].

Efficient triage ensures that healthcare resources match patient demand, especially during crises like pandemics. However, improper triage can lead to under-triage or over-triage, impacting patient outcomes and resource allocation[2]. Triage nurses must receive regular training in basic life support and other essential skills to handle urgent situations effectively [32].

In conclusion, nursing education is vital for effective triage in emergency wards. By ensuring nurses possess the necessary knowledge and skills, healthcare organizations can optimize patient care, reduce adverse events, and improve outcomes[10].

Triage is essential for enhancing patient throughput by improving the speed and appropriateness of treatment in emergency departments (EDs). It involves collecting pertinent information about patients and using a valid and reliable triage acuity scale to guide decision-making [31].A study on triage knowledge and practice among emergency department nurses found that 147 participants generally had high levels of triage knowledge and practice. However,

deficiencies in knowledge and incorrect practices were noted in some aspects. Most participants (95.9%) had access to triage systems, and more than half (53.7%) used them regularly[2].

A study assessing prehospital emergency medical staff's skill and knowledge regarding triage in mass casualty incident (MCI) events involved 127 participants, with a median age of 24 years. The study highlighted varying levels of knowledge and skills among staff [3]. A cross-sectional study among emergency nurses in a large tertiary hospital in Kenya found that 81.7% had experienced workplace violence (WPV), with the main forms being verbal abuse, physical violence, and sexual harassment, primarily perpetrated by patients and their relatives[9].A study conducted in Greece demonstrated that a 45-minute e-learning program on the Swiss Triage System (STS) significantly improved the triage accuracy and decision-making of 36 emergency nurses[14].

A systematic review of triage performance in emergency medicine evaluated various triage systems' effectiveness in identifying patients at risk for adverse outcomes. It found high sensitivity in identifying patients with ED mortality but low sensitivity for critical illness and post-encounter mortality[8].A comprehensive review of studies addressing queueing-related problems in EDs included 229 articles and books over seven decades. The review organized information on applications of queueing theory, bed management, fast-track, dynamic resource allocation, patient grouping/prioritization, and triage approaches[7].

Technology, particularly electronic triage systems, significantly enhances nurses' knowledge and practice by providing standardized decision-making algorithms and real-time alerts. Regular training and simulation exercises are crucial for reinforcing triage skills[6].A systematic review evaluated several triage scales, including the Canadian Triage and Acuity Scale, Emergency Severity Index, and Manchester Triage Scale. These systems showed high sensitivity for identifying ED mortality but lower sensitivity for critical illness outcomes and post-encounter deaths [8].

A study found a statistically significant relationship between age and knowledge among ED nurses, with older nurses showing higher knowledge levels. However, this relationship was not seen in all contexts. Experience also positively correlated with knowledge in some cases[4].A realist review highlighted the importance of securing triage processes for optimal ED functioning and safe care. It identified barriers to effective interdisciplinary collaboration in triage and suggested strategies to improve collaboration and patient outcomes [12].

METHODOLOGY

• The study quantitative cross-sectional design was used, collecting data from a sample population at a single point in time. The study was conducted at Ali Fatima Hospital from February 2024 to June 2024, with a sample size of 30 participants selected using random sampling to minimize bias and ensure representation. The sample consisted of emergency students and staff nurses with at least one year of clinical experience, and individuals motivated to improve their triage skills.The Independent Variables of the study is Nurse’s Knowledge and Dependent Variables isTriage Practice.The inclusion criteria of the study included students and staff nurses of the emergency department . The Exclusion criteria of the study included students lacking interest or willingness to participate, non-paramedical staff, and staff from other departments.

The study instruments included an adaptive questionnaire with demographic and MCQ sections to assess participants' knowledge of triage management. Ethical considerations were adhered to, following the rules and regulations set by the Ali Fatima Hospital ethical committee. Written informed consent was obtained from all participants, and their rights were respected. Data collection was kept confidential, and participants remained anonymous throughout the study. There were no risks associated with the research, and participants were free to withdraw at any time. The benefits of participation included improved triage skills, and privacy was protected to ensure participants' identities were not revealed in any publications resulting from the study.

statistical software SPSS which means Statistical Package for Social Sciences used for data analysis.T-test can be applied to compare the effectiveness of the strategies applied to nurses to see whether there is an improvement in the dependent variable of stratification. Paired T test used to analysis the categorical data such as degree of satisfaction among nurses from the training program.

This study used a significance level of 0.01 ($p < 0.01$) to indicate the statistical significance. This shows the statistical significance p-value is less than 0.05 consequently results with the value below 0.05 are deemed to be statistically significant.

Data Analysis Process that was ethical concerns including the minimum potential risk of privacy and the rights of the participants.

RESULTS

The intervention led to a significant improvement in knowledge levels among the nurses: Nurses who received education on guideline-driven triage demonstrated higher knowledge scores and better practice skills. Our study results shows that;

Table1: show the Demographic variables frequencies and percentage

Age	**Frequency**	**Percentage**
	20-25	15%
	26-30	15%
	Total	30
Gender	Female	30%
Education	**Frequency**	**Percentage**
	Bachelor	12%
	Post graduate	17%
	Diploma	01%
	Total	30%
Experience	**Frequency**	**Percentage**
	Less than one year	16%
	1-3	09%
	3-5	03%
	More than 5 years	2%
	Total	30%

Table 1 shows that the sample consists of 30 female participants with an even split between the age groups of 20-25 years and 26-30 years. Education levels vary, with 40.0% holding bachelor's degrees, 56.7% holding postgraduate degrees, and 3.3% holding diplomas. In terms of experience, 53.3% have less than 1 year of experience, 30.0% have 1-3 years, 10.0% have 3-5 years, and 6.7% have more than 5 years of experience.

Table 2: Show the statistical paired test

Paired sample statistics		Mean	N	Std. Deviation	Value of p
Pair 1	**PREKNOWLEDGE**	35.69	30	11.136	<.001
	POSTKNOWLDEGE	53.97	30	14.615	

The Pre-intervention Knowledge Mean Score: 35.69(Std. Deviation: 11.136) and Post- intervention Knowledge Mean Score: 53.97 (Std. Deviation: 14.615) with P-value :< 0.01 show substantial increase in mean scores from pre- to post-intervention indicates the effectiveness of the educational program. Conclusion: This study confirms that targeted educational interventions can significantly enhance nurses practice.

DISCUSSION

This study demonstrates the effectiveness of targeted education in enhancing triage competence among nurses. Education significantly improved knowledge, skills, and patient placement accuracy, reducing errors and promoting patient safety. Findings support the integration of triage education into nursing curricula and ongoing professional development.

The 95% confidence interval for the mean difference does not include zero, indicating that the improvement in knowledge is statistically significant. The findings suggest that the nursing education regarding triage protocols, guigelines significantly improves nurses' knowledge regarding triage management during rmergency situation .

[2,4] examine nurses' triage knowledge and practice, shedding light on factors influencing triage competency and the need for ongoing education and training. Moreover [14] provide evidence that training improves triage decisions among emergency nurses, emphasizing the effectiveness of educational interventions in enhancing triage accuracy. [8] Review triage performance in emergency medicine, highlighting challenges and areas for improvement in triage processes. [12] discuss strategies to improve the quality of nurse triage in emergency departments, emphasizing the importance of evidence-based approaches in enhancing triage effectiveness. Additionally [7,27] review queuing problems

in emergency departments, providing insights into practical approaches and research methodologies for optimizing triage processes.

Whereas our study underscores the importance of nursing education in facilitating guideline-driven triage in emergency services. By equipping nurses with the knowledge and skills necessary to conduct effective triage assessments, educational interventions contribute to improved patient outcomes, optimized resource utilization, and enhanced healthcare delivery in emergency settings. Moving forward, continued investment in nursing education and professional development is essential for advancing the quality and safety of emergency care worldwide

CONCLUSION

The study found that education programs significantly improve nurses' triage accuracy, ensuring patients receive appropriate care levels. This reduces over triage and under triage risks, enhancing patient outcomes. By adhering to guideline-driven protocols, nurses more consistently assess patient severity, increasing safety by minimizing misclassification. Educated nurses streamline emergency department processes, prioritizing patients effectively, optimizing resource use, and reducing wait times.

Standardized triage practices resulting from such education minimize variability in patient assessments and treatments. Additionally, educated nurses report increased confidence and competence, leading to better communication and collaboration in emergency care. Integrating these educational programs into nursing curricula and professional development is highly recommended.

ACKNOWLEDGEMENT: None

CONFLICT OF INTEREST: None

GRANT SUPPORT AND FINANCIAL DISCLOSURE: None.

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Authors Contributions:

Aiman Fiaz and Tanzeela Atta: Substantial contributions to the conception and design of the work.

Ayesha Ghaffar and Alina Hameed: Design of the work and the acquisition. Drafting the work.

Hajira Sarwar: Final approval of the version to be published.

Submitted for publication: 05-05-2024
Accepted after revision: 05-06-2024

Original Article

Open Access

Assessing the satisfaction level of Nursing students towards clinical placement across academic year in private Nursing colleges at Banu

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ABSTRACT

Background and Objectives: Assessing the Satisfaction Level of Nusing Students towards Clinical Placement across Academic year in Private Nursing Collages At Bannu. The aim of this research was to assess the satisfaction of undergraduate nursing students regarding their clinical placements in Private Nursing Colleges at Bannu.

METHODOLOGY: A cross-sectional survey was conducted with nursing students from private nursing colleges in Bannu. An adapted questionnaire was used from a study published in 2023 to assess their clinical satisfaction in different areas, such as mentorship, availability of resources, and interactions with instructors. The sample consisted of 70.2% male and 29.8% female students belonging to both third and fourth-year academic levels.

RESULTS: Many students experienced the clinical placements with low to moderate satisfaction. Only 20.8% demonstrated high satisfaction, while 42.3% reported a low satisfaction level. Fourth-year students were satisfied more than third-year students, and there was a positive correlation between academic progression and clinical comfort. General hospital setting: Allocation to general hospitals provided exposure to a wide range of clinical experiences but had several stressors regarding the level of acuity and availability of resources (77.4%).

CONCLUSION: Much lies behind the influencing factors for clinical satisfaction regarding nursing students it is growing with a greater emphasis on the improvement of mentorship, resource allocation, and gender-sensitive support. The development of such areas would improve the experiences of learning and potential satisfaction levels of the students. Future longitudinal approaches within a diversified setting of research will dissect causative factors relating to clinical satisfaction.

KEYWORDS: Nursing students, clinical placement satisfaction, mentorship, gender dynamics, clinical learning environment, undergraduate nursing education

INTRODUCTION

Clinical placement is an actual, structured real-world environment where students transition from theoretical learning to practical application. This environment is critical for closing the gap between academic scholarship and practice, developing clinical skills, critical thinking, and professional competence. Working closely with experienced healthcare professionals provides valuable insights related to patient care, safety protocols, and the dynamics of healthcare teams, forming an integral part of students' professional growth and readiness for future practice. Positive and supportive relations with clinical mentors and team members significantly influence students' learning experiences. Clinical placement not only enhances practical abilities but also provides confidence and competency, essential for readiness in actual practice roles as healthcare professionals (1).

Structuring the clinical environment enriches nursing students' experiences. A good clinical setting provides an applied learning environment that approximates actual healthcare settings, reminding students of their application skills. The different experiences during clinical placements influence students' perceptions of nursing as a profession and its foundational role. A clinical curriculum develops critical competencies such as clinical reasoning, decision-making, self-assessment, and academic motivation, vital for preparing students for real healthcare settings (2). Positive

How to cite this: Rafi L, Wahab A, Abdullah M. Assessing The satisfaction level of nursing students towards clinical placement across academic year in private nursing colleges at bannu. International Journal of Healthcare Profession. 2024; 1(2):19-24

Vol. 01, Issue 02, April-June, 2024

clinical placement experiences nurture critical thinking and problem- solving skills while fostering self-confidence, essential for building professional identity and commitment to nursing values (3).

A well-planned clinical placement offers a safe, inclusive, and supportive environment, preparing students for the challenges inherent in nursing practice. Essential preparatory elements, including preclinical orientation, student grouping, and clearly defined learning objectives, anchor students to maximize hands- on learning opportunities (4). However, poorly structured clinical environments and inadequate assessment practices can emotionally exhaust students, hinder learning, and affect patient care quality. Addressing such shortcomings by fostering supportive environments can enhance students' professionalism and preparedness for nursing demands.

Significant gaps in clinical placements include unmet psychosocial needs, the absence of relaxation areas, and a lack of adequate supervision. Recognizing these needs enables clinical environments to support students' well-being and resilience, facilitating a productive learning atmosphere (5). Exposing students to diverse healthcare settings and specialties enhances satisfaction and career aspirations. Effective coordination between training institutions and healthcare facilities is critical for creating an integrated learning framework, providing practical experiences that guide students toward competent nursing practice (6).

Student satisfaction with clinical placement leads to valuable experiences crucial for professional development. Measuring satisfaction informs improvements in nursing programs, enhancing education quality. Satisfactory placements contribute to academic success, student retention, and professional growth, emphasizing the need for upgraded clinical supervision and proactive measures to support nursing students' learning and skill development (7, 8, 9).

METHODOLOGY

The study employed a descriptive cross-sectional design to assess nursing students' satisfaction with clinical placements across academic years in private nursing colleges in Bannu. The research was conducted at Al-Mumtaz College, Al-Burhan College, and Taj College of Nursing and Allied Health Sciences, Bannu, with a sample of 168 students selected using Simple Random and Convenient sampling from a population of 250. Inclusion criteria involved students with at least one year of clinical rotations, while those unwilling or lacking consent were excluded. Data was collected through a 24-question questionnaire, encompassing sociodemographics and satisfaction levels measured via a 5-item Likert scale. SPSS version 26 was used for analysis, categorizing satisfaction into low (20–46), average (47–73), and high (74–100) levels, with results displayed using descriptive statistics. Ethical approval was obtained, ensuring informed consent, confidentiality, and the right to withdraw.

RESULTS

The gender distribution of respondents reveals a notable predominance of males in the study sample. Out of 168 participants, 118 (70.2%) were male, while 50 (29.8%) were female. This indicates a significant gender disparity, with males constituting the majority of the sample.

When analyzing the respondents based on their year of study, it was observed that 80 students (47.6%) were in their 2nd year, while 88 students (52.4%) were in their 3rd year. Although the distribution is relatively close, the number of 3rd-year students slightly exceeded that of 2nd-year students.

The "Type of Nursing Ward of Last Clinical Placement" demonstrated diverse clinical exposure among the 168 participants. The majority reported placements in "Other" wards, comprising 43 participants (25.6%), followed closely by placements in the "Surgical" ward, which accounted for 42 participants (25.0%). The "Medical" ward ranked third with 35 participants (20.8%), while 24 participants (14.3%) were assigned to "Geriatrics" wards. Additionally, 20 participants (11.9%) were placed in "Pediatrics," and only 4 participants (2.4%) reported placements in "Gynecology" wards. This distribution underscores the varied clinical experiences of nursing students, with a significant focus on surgical and medical care. Regarding the "Category of the Hospital Where the Clinical Placement Took Place," the data highlights that 130 participants (77.4%) were placed in general hospitals, making it the most common clinical setting. Specialized care centers accounted for 33 placements (19.6%), while 5 participants (3.0%) had their placements in outpatient departments. These findings emphasize the reliance on general hospitals for clinical training, reflecting their central role in nursing education. This data is further detailed in Table 1, providing a comprehensive overview of the participants' demographic and clinical placement characteristics. Level of Satisfaction" groups data for participant satisfaction

scores into three unique groups: Low Level of Satisfaction, Average Level of Satisfaction, and High Level of Satisfaction.

Table 1: Sociodemographic pattern of respondents.

Variable	Category	Frequency (%)
Gender	Males	70.2
	Females	29.8
Year of study	2nd year	47.6
	3rd year	52.4
Category of Hospital	General	77.4
	Specialized	19.6
	Out patients	3
Type of ward	Surgical	25
	Medical	20.8
	Paedriatrics	14.3

Out of the 168 participants, the majority score was in the "Low" satisfaction category and was at 71 participants or 42.3%. This is an indication that almost half of the participants felt not satisfied or very low in satisfaction with services or experiences evaluated. A large proportion of the respondents, 62 people or 36.9% reported "Average" satisfaction levels. This group represents those that were moderately experienced, neither all dissatisfied nor highly satisfied, reflecting a neutral or mixed sentiment. Meanwhile, only 35 participants (20.8%) scored "High," making it the smallest group. This relatively low percentage of highly satisfied respondents suggests that a smaller portion of the population had exceptionally positive experiences, highlighting potential gaps in service quality or unmet expectations for many respondents. The overall distribution shows a positive skew towards the lower end of satisfaction levels, where a large percentage of the respondents (42.3%) reported dissatisfaction. Such a finding brings to the fore areas where improvement is needed to raise satisfaction levels. The low number of participants in the "High" satisfaction category (20.8%) points to the need for targeted interventions to raise satisfaction among the population at large. This classification is helpful in gaining insights into the satisfaction levels of the participants and lays a foundation for potential areas of improvement in service delivery, training, or patient engagement strategies.

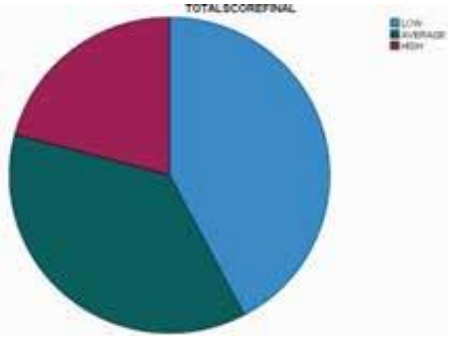


Figure 1: Level Of satisfaction

DISCUSSION

The research explores the satisfaction of nursing students regarding their clinical rotations, and findings suggest a general low to moderate satisfaction, which is in agreement with other studies about the challenges in clinical practice. Clinical rotations are part of nursing education, allowing students to be exposed to actual practice in patient care and health environments. As Smith et al. (10) mentioned, deficits in resources are one of the major hindrances in the effectiveness of clinical learning. These deficits tend to comprise inadequate staff and medical equipment, as well as clinical training programs that are disorganized and unstructured, thus offering students numerous barriers to attempting to get hands-on experience. More importantly, Lee and Kim (2) highlight how inadequate systematic support in the clinical environment presents an added disadvantage to this learning process. Mentorship and hospital facilities are essentials for enhancing students' clinical experience. As Garcia et al. (11) pointed out, supportive environments are critical for increasing satisfaction levels. These encompass consistent guidance from clinical instructors, well-organized rotations, and availability of essential resources. Mentorship, in particular, has been shown to foster confidence and competence among students, enabling them to perform better in clinical settings. Yet, the study revealed that a significant portion of students (46.4%) experienced limited communication with their mentors, which negatively impacted their satisfaction. This finding is echoed by Li and Zhou (6), who assert that adaptive mentoring tailored to students' individual needs is critical for their growth and satisfaction. Similarly, Miller and Ahmed (7) advocate for structured mentorship programs that encourage open communication and regular feedback. Gender dynamics also play an important role in influencing clinical experiences among nursing students. According to Johnson et al., (2) male students face

particular challenges in satisfying their needs during rotations, such as social stigma and stereotyping. These often follow from societal perceptions that nursing is for women only, creating particular stressors on male students' experiences. To bridge these gaps, Al-niarat and Abomoghli (12) recommend gender-sensitive approaches toward nursing education to make the educational environment more inclusive. Khan and Begum (13,15) also propose that interventions such as workshops and counseling be specifically tailored to create a balanced and supportive learning environment for all students. The findings also showed that the satisfaction levels of the senior students were slightly higher than those of the junior students. Among the respondents, 47.6% were fourth-year students, while 52.4% were third-year students. This aligns with findings by Splitgerber et al. (14,16), who attribute the higher satisfaction levels among senior students to their increased confidence and competence gained through experience. Senior students are typically more familiar with clinical procedures and expectations, which allows them to navigate challenges more effectively than junior students.

The clinical placement setting also influenced students' satisfaction levels. General hospitals, where the largest percentage of placements, 77.4%, took place, offered varied learning opportunities yet caused extreme stress due to patients' acuity and workload. It is similar to what is indicated by Garcia et al. (6) and Kim and Tanaka (7), who indicate the pace at which general hospitals function tends to overwhelm their students, especially those in the lower rungs with less experience in clinical settings. On the other hand, specialized care units provided more targeted support and were associated with higher satisfaction levels. According to Hassen et al., "the smaller patient-to-staff ratio and targeted learning opportunities in specialized units create a more conducive environment for skill development.(18,19,20)"

The high variation of satisfaction levels was another striking finding of the study. The mean score of satisfaction was 49.61 and the standard deviation was 18.959. Such diversity calls attention to the various experiences faced by nursing students while performing their clinical rotations. Quality mentorship, availability of resources at a hospital, and an individual's response mechanism contribute towards such differences. Chen et al. (8) and Dillu and Soren (15) focus on delivering individually customized feedback and providing person-centered support in dealing with students' differential needs. For example, regular debriefing sessions and one-on-one mentoring can help students process their experiences and identify areas for improvement. While the study provides valuable insights into the factors affecting nursing students' satisfaction during clinical rotations, it also underscores the need for further research. Longitudinal studies are essential to explore how satisfaction levels evolve over time and to assess the impact of tailored interventions in different clinical settings. Comparative studies across various institutions. could provide a broader perspective on best practices for enhancing student satisfaction.

However, there were critical outcomes in regard to the overall findings; more significantly, these highlight critical points of importance, focusing on quality mentorship, effective student support systems. Key strategies include improving resources deficits, developing gender-sensitive schemes, and offering differentiated individualized feedback for attaining higher levels of student satisfaction. Therefore, based on this perspective, programs in nursing education must strategize about how better to position graduates and get them better prepared and focused for their future performance and success in clinical work environments.

CONCLUSION

As concluded from this survey, a major proportion of nursing students respond with low to moderate degrees of satisfaction regarding their clinical placements. This finding suggests how clinical placement experiences are rich and complex and are, therefore, influenced by factors such as the hospital context, gender dynamics, mentorship quality, and resources. The results coincide with earlier studies and conclude that clinical satisfaction among nursing students often results from a combination of institutional, societal, and individual factors. Improving the clinical learning environment, and hence the preparedness and enthusiasm of students to practice professionally depends on these issues.

Strength of the study: This study's special strength includes the focus placed on students' unique nursing experiences made during clinical exposures, making it comprehensive by providing proper information about level satisfaction with factors affecting satisfaction as research of this sort has yet to be held in some areas like Bannu. The study also equips the ability to peer deeper into other demographic factors such as gender

that affect clinical satisfaction in virtue of sample size and gender distribution. Placing the findings within a larger perspective and building validity by comparison with other recent and pertinent studies offers a much more vivid view of trends in nursing education.

Limitation of the Study: Despite its contributions, this study has several deficiencies. For one, as the study was conducted within a specific institutional and spatial context, the findings do not have as much of a generalizable application to any other area or education setting where clinical placement satisfaction differs. Longitudinal designs would be necessary to trace temporal patterns in satisfaction across student clinical education since its cross- sectional design restricts its ability to examine trend changes in satisfaction.

Recommendations: Several recommendations are based on these findings. Hospitals and schools of nursing should adopt structured mentoring programs under which the students receive regular encouraging advice. Improvement in the resource base of the clinical environment, such as good provision of medical facilities and equipment may also increase the quality and satisfaction of experiences by students. Moreover, gender-sensitive teaching approaches and awareness programs in clinical education may help to overcome some of the specific issues that male nursing students encounter and may provide a friendlier environment to all. Future studies could investigate changes in satisfaction levels over time and also draw participants from a more diverse set of institutions. It can use longitudinal designs.

ACKNOWLEDGEMENT: None

CONFLICT OF INTEREST: None

GRANT SUPPORT AND FINANCIAL DISCLOSURE: None.

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Authors Contributions:

Memoona Saleem: Substantial contributions to the conception and design of the work. Design of the work and the acquisition. Drafting the work. Final approval of the version to be published.

Submitted for publication: 12-05-2024
Accepted after revision: 10-06-2024

Original Article

Open Access

Impact of Early Rehabilitation In Upper Extremity Of Burn Patients

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ABSTRACT

Background and Objectives: 'Burn Rehabilitation' joins the physical, mental and social parts of care and it is regular for burn patients to encounter challenges in one or these zones following a burn injury. The points of burn restoration are to limit the antagonistic impacts brought about by the injury as far as keeping up scope of development, limiting contracture improvement and effect of scarring, boosting useful capacity, amplifying mental prosperity, expanding social incorporation. To evaluate the impact of Early Rehabilitation In Upper Extremity Of Burn Patients.

METHODOLOGY: Randomly selected 102 patients in Burn ward who had received physiotherapy treatment for 4 to 6 weeks. After getting regular physiotherapy treatment, we used DASH questionnaires to check the functional abilities of upper limb of burn patients.

RESULTS: 55% of the patient feel mild difficulty in doing daily life activities after getting 4 to 6 weeks of physiotherapy treatment. MMT of upper limb shows more than 60 % slightly limited ROMs. Due to proper positioning and physiotherapy exercises only 2% of patients having contracture in upper limb. Chest physiotherapies minimize the risk of obstruction of airways and maintain the saturation level of oxygen.

CONCLUSION: Early outpatient exercise training implemented at hospital discharge represents an effective intervention to improve muscle mass and function after severe burn injury.

KEYWORDS: Burn injury, Rehabilitation, MMT, physiotherapy, upper limb

INTRODUCTION

A burn is a form of damage to pores and skin, or other tissues, as a result of heat, cold, electricity, chemical substances, friction, or radiation (like sunburn). Most burns are due to warmth from hot liquids (known as scalding), solids, or fireplace. While costs are similar for women and men the underlying causes frequently range. The clinical research of burn pain traits reveals very clear-cut variations between non-stop pain and pain because of healing tactics which should be treated one after the other. Some of the main features of burn ache are: (1) its long-lasting course, regularly exceeding recovery time, (2) the repetition of noticeably nociceptive procedures that can lead to severe mental disturbances if ache manage is beside the point

Burn trauma represents a sort of injury that may be because of heat, freezing, energy, chemical substances, radiation or friction. Burn accidents are particularly variable in terms of the tissue affected, the severity and resultant complications. Muscle, bone, vascular, dermal and epidermal tissue can all be damaged with next ache due to profound harm to nerves. Depending at the area affected and burn intensity, a burn sufferer might also revel in a huge number of probably fatal complications together with shock, contamination, electrolyte imbalances and respiration failure. Beyond bodily complications, burns can also result in severe mental and emotional distress because of long-term hospitalization, scarring and deformity [12]

Procedural torment: (Primary mechanical hyperalgesia): serious consuming and stinging that proceeds less significantly, however might be joined by irregular sharp agony for quite a long time or then again hours following dressing changes or physiotherapy/word related treatment. Pounding, agonizing

How to cite this: Saleem M. Impact of Early Rehabilitation in Upper Extremity of Burn Patients. International Journal of Healthcare Profession. 2024; 1(2):25-29

Vol. 01, Issue 02, April-June, 2024

torment might be related with situating of consumed furthest points (for example situated underneath the degree of the heart); this is believed to be identified with pressure related with excited, oedematous tissue. Procedural torment is the most serious and most under-treated torment related with consume wounds.

Procedural torment and related agony tension: research demonstrate torment nervousness increments over time in consume harmed patients. Solid connections have been set up between torment, physiological pain and physical and mental results in the two grown-ups and youngsters. Foundation torment: patients with high nervousness have expanded degrees of foundation torment. There is a wide fluctuation in the torment power following injury. Foundation torment is portrayed by delayed length, generally steady gentle moderate force torment. The

torment has been portrayed as ceaseless copying or pulsating, present in any event, when the patient is moderately stationary. This torment is best treated with consistently booked analgesics.

Advancement torment: transient intensifying of agony regularly connected with development.

Patients additionally report unconstrained torment that might be identified with changing instruments of agony, after some time or insufficient absense of pain. The agony can be depicted as stinging, shooting, pricking or on the other hand beating. Agony following development can be related with essential mechanical hyperalgesia, yet most consideration suppliers for those with consumes believe torment with development to be advancement torment.

This study is an strive to reveal all the short comings which can be hindering the provision of proper treatment and care to the burn patients. It will carry mild to all the motives due to which physical therapy regardless of its proof primarily based impact is not always being supplied to the sufferers. Physical therapy is now a key factor of health sciences the world over and it has many evolved sub-specialties. The wound care is one of them, and bodily therapists operating in wound care constantly play a key function in affected person management. Physical remedy improves the consequences if protected within the treatment plan of burn injuries. The scientific practitioners treating the burn accidents are not simplest conscious but display an effective mind-set towards the importance of the inculcation of healing maneuvers for proper care of the burn patients. They agree that physical remedy is crucial for all the patients and must be supplied during the preliminary remedy and the entire rehabilitation technique. Ample quantity of proof exists that suggests that the processes used in physical remedy are indeed very powerful in treating the patients. Emphasizing the position of bodily remedy in burn care will consequently improve the excellent of care supplied to the affected person. The concept that wishes to be promoted as lots as possible is that of a multidisciplinary method in treating the affected person. All the selections concerning patient care proper from the preliminary evaluation, instant emergency care, rehabilitation and observe up after discharge must be made by means of a group with the health care professional, bodily therapist, care givers and an orthotist if needed as participants.

METHODOLOGY

Data was collected from Jinnah Burn and Reconstructive Surgery Center Lahore. Study will be completed within 6 months after the approval of synopsis.

convenience sampling technique was used for this study. By using this sampling procedure can make a judgment about sample & able to collect in depth data from participant according to research needs. Convenience sampling strategies are designed to enhance the understanding of selected individual or group experience or for developing theories & concepts Inclusion criteria: Patient having at least 4-5 session physiotherapy treatment–because the usual treatment is 6 session, so after 5 session it can be easily understandable the treatment outcome,Participants with any age group, Male and female both were the participants,Both literate and illiterate patient were included on the study, Participants who took physiotherapy treatment,Patients having any type of burn of upper limb Exclusion criteria:Participant who are not interested. ,Mental challenged people, ICU patientmedically unstable patient ,paralyzed patient,Patient of having burn in lower extremity.

Randomly selected the 102 patients in Burn ward who is receiving physiotherapy treatment for 4 to 6 weeks. After getting regular physiotherapy treatment, we use DASH questionaries to check the functional abilities of lumber limb of burn patients.

Data value collected by the help of questionnaire. we used SPSS (statistical package for social sciences) version 21 for data entry along with to make chart and table purpose and to test the hypothesis by evaluating p-value. Endnote 7 was used for the citation purpose.

RESULTS

A total of 100 respondents participated in the survey, reporting their perceived levels of difficulty.The majority of respondents (57%) reported experiencing Mild Difficulty, accounting for 55.9% of the total responses. A significant proportion (33%) reported

Moderate Difficulty, making up 32.4% of the responses. A smaller percentage (8%) reported experiencing Severe Difficulty, accounting for 7.8% of the responses. Only 4 respondents (4%) reported experiencing No Difficulty, representing 3.9% of the total responses.

Table 1 Showed the Quality of Life

	Frequency	Percent
No difficulty	4	3.9
Mild difficulty	57	55.9
Moderate Difficulty	33	32.4
Severe difficulty	8	7.8
Total	**100**	**100.0**

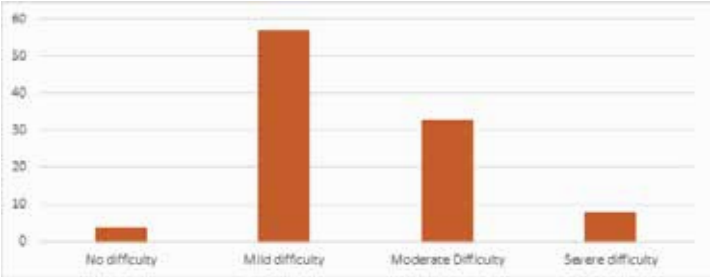


Figure 1 Showed the difficulty in form of percentage

DASH Scale Interpretation No Difficulty (0-12.9): 4 (3.9%) - Respondents with little to no difficulty in performing daily activities. Mild Difficulty (13-27.9): 57 (55.9%) - Respondents with some difficulty, but able to perform most daily activities. Moderate Difficulty (28-43.9): 33 (32.4%) - Respondents with noticeable difficulty, requiring some assistance or modifications. Severe Difficulty (44-64.9): 8 (7.8%) - Respondents with significant difficulty, requiring substantial assistance or unable to perform daily activities.

Note: The DASH scale ranges from 0 (no disability) to 100 (most severe disability). The categories above are approximate and based on the original DASH scale validation study.

Table 2 Showed the DASH SCALE

	Frequency	Percent
No difficulty	2	3.9
Mild difficulty	56	55.9
Moderate Difficulty	35	32.4
Severe difficulty	8	7.8
Total	**100**	**100.0**

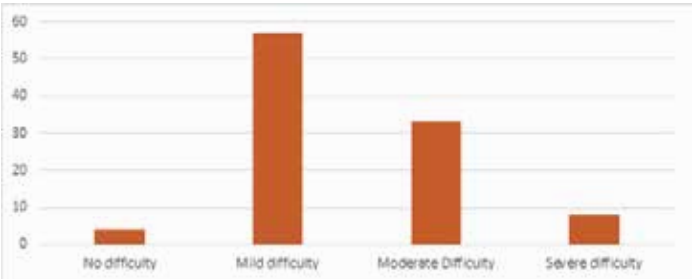


Figure 2 Showed the difficulty while performing activity

DASH Scale Interpretation No Difficulty (0-12.9): 4 (3.9%) - Respondents with little to no difficulty in performing daily activities. Mild Difficulty (13-27.9): 57 (55.9%) - Respondents with some difficulty, but able to perform most daily activities. Moderate Difficulty (28-43.9): 33 (32.4%) - Respondents with noticeable difficulty, requiring some assistance or modifications. Severe Difficulty (44-64.9): 8 (7.8%) - Respondents with significant difficulty, requiring substantial assistance or unable to perform daily activities.

Note: The DASH scale ranges from 0 (no disability) to 100 (most severe disability). The categories above are approximate and based on the original DASH scale validation study.

DISCUSSION

Restoration of consumes patients is a continuum of dynamic treatment beginning from admission. Depending on the size and seriousness of the injury, the patient's age and other pre-grim variables, this stage can last from a couple of days to a while. The patient might be an inpatient or might be treated as an outpatient and is probably going to go through customary dressing changes, which are regularly excruciating and may likewise be a terrifying encounter for the patient. It is fundamental that physical restoration is initiated at day 1 of confirmation whether the patient is ambulant and well or on bed rest and immobile. Postural the executives of the patient by lifting the head and chest assists with chest leeway and lessens growing of the head, neck and upper aviation route. In the beginning phases, huge oedema might be available especially in the peripheries; helpless situating can prompt superfluous extra dreariness which can be maintained a strategic distance from. Height of all appendages influenced is fundamental so as to rapidly decrease oedema; hands ought to be supported or situated and feet kept at 90 degrees, care and consideration should likewise be given to the impact point region which can rapidly create pressure. Anti-contracture situating and bracing must begin from the very first moment and may proceed for a long-time post-injury. It applies to all patients if they have been skin united. Situating is critical to impact tissue length by restricting or repressing loss of ROM auxiliary to the improvement of scar tissue. Patients rest in a place of solace; this is commonly a place of flexion and furthermore the situation of contracture. At the point when consumes happen to the flexor part of a joint or appendage the danger of contracture is more noteworthy. This is because of the situation of solace being an utilized position; likewise the flexor muscles are com

monly more grounded than the extensors so should a consume happen to the extensor angle, patients can utilize the quality of the flexors to extend the specific zone. The flexed position is the situation of capacity for instance catching the hand, forward flexion of the shoulder and flexing the neck. Without progressing counsel and help with situating, the patient will keep on taking the situation of contracture and can rapidly lose ROM in various joints. When contracture begins to create it tends to be a steady fight to accomplish full development, so precaution measures to limit contracture improvement are essential. Early consistence is basic to guarantee the most ideal long-haul result and furthermore to ease torment and help with practice systems.

CONCLUSION

Recovery from a consume injury is an extensive cycle, which begins on the very beginning and includes a continuum of care through to scar development and past. It includes a devoted multidisciplinary group of experts and the full support of the patient. Supporting a burn injury, anyway huge or little can have a sensational effect on the person's physical and mental prosperity and requires collaboration and duty to enable every person to conquer the challenges they may experience. While the way isn't in every case simple, with the correct help and restorative mediation, the dedication of the group to not acknowledge even one contracture and give comprehension of the mental and social difficulties, the patient can arrive at their greatest physical, mental and practical result.

ACKNOWLEDGEMENT: None

CONFLICT OF INTEREST: None

GRANT SUPPORT AND FINANCIAL DISCLOSURE: None.

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Authors Contributions:

Manahil Ghulam Mustafa: Substantial contributions to the conception and design of the work.

Abeela Ashraf: Design of the work and the acquisition. Drafting the work.

Fizza Basit: Final approval of the version to be published.

Submitted for publication: 21-04-2024
Accepted after revision: 25-05-2024

Original Article

Open Access

Assessing Quality of Life in Young Athletes with Patellofemoral Pain Syndrome

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ABSTRACT

Background and Objectives: Patellofemoral Pain Syndrome (PFPS) is very common among the young adult sports population, which is characterized by pains around the front of the knee. This condition greatly reduces participation in sports, causing constant pain and discomfort, fitness levels to drop, and reflecting general health deterioration. Thus, it is crucial to explore its rate and consequences for QoL to create efficient management plans. The purpose of this research is to evaluate the level of patellar pain in the young people sample and identify the effect this condition has on the subject's quality of life. This research aims at establishing the percentage of young people who are impacted by PFPS alongside evaluating its impact on their health.

METHODOLOGY: This study's design was cross-sectional and included 151 participants aged 15 to 30 years old, selected through convenient sampling. Questionnaire data were collected using a standardized questionnaire comprising the Kujala anterior knee pain scale and the numeric rating scale. Descriptive statistics and Pearson correlation were used for the study.

RESULTS: The survey examined some ailments common among adults and established that knee pain was more common in young adults with 18-year-olds indicating 11.8% and 27-year-old 9.9% of the sampled population suffering from the ailment. It also reduced with age indicating that, patients with DM had better control and alterations in their activity levels.

CONCLUSION: Regarding the research findings, the study reveals that young people experience knee pain which affects their activities and involvement in sporting activities. Therefore, it could be understood that management strategies are crucial to decrease the extent of pain and enhance the quality of life.

KEYWORDS: Anterior Knee Pain, Quality of Life Numerical Pain Scale.

INTRODUCTION

Prepatellar knee pain is another regular problem, particularly among the physically active population, that stems from misalignment of the knee extensor apparatus. This condition mostly develops when there is pressure exerted on the patellofemoral joint, especially during exercises (1). Other elements are patellar pathologies and injuries to the extensor mechanism which hinders proper tracking of the patella during flexion/extension at the knee joint (2). Some people may present with complaints of generalized knee pain while others present with patellar instability, which presents different symptoms and clinical examinations (3). Counselling and detailed clinical assessment shall be done as a way of identifying the causative factors so that the right treatment can be offered. Hip strength deficits have been reported in 85% of AS patients, especially for quadriceps muscle during eccentric contractions and anterior knee pain has also been identified as a significant finding in AS patients Likewise, recent studies have emphasized biomechanical alterations of tissues as potential sources of patellofemoral pain rather than structural factors (4).

The common manifestations of the condition can be pain, instability, and misalignment during dynamic tasks such as squatting and stair climbing. Position of the patella, muscle imbalance of the quadriceps particularly the vastus medialis and lateralis, and weakness in the hip abductors or flexors also contribute to some

How to cite this: Ghulam M.M, Ashraf A, Basit F. Impact of Early Rehabilitation in Upper Extremity of Burn Patients. International Journal of Healthcare Profession. 2024; 1(2):30-35

Vol. 01, Issue 02, April-June, 2024

knee pain (5).

These can be broadly categorized as intrinsic factors like cartilage or subchondral bone healing ability and extrinsic factors like mechanical quadriceps wasting and femoral rotation.

These muscular injuries are common among athletes as they result in anterior knee pain stemming from extensor mechanisms that have been overstressed through use or injury. That is why some pain originates from Hoffa's pad or quadriceps tendon lesions. Optimal clinical assessment focusing on the patient's history, followed by specific imaging and laboratory examination when needed, helps distinguish between various conditions, such as patella alta, and other potential factors (6).

Objectives:

- To determine the incidence and the frequency of anterior knee pain among young athletes with PFPS.
- To evaluate changes in the level of sports participation and physical activity among young athletes following the occurrence of PFPS.
- To establish the correlation between the intensity of knee pain in young athletes with PFPS and the functional impairment in activities during sports and daily life.

Rationale:

By identifying the tasks and sports affected by knee pain, more appropriate interventions can be recommended (7). This study will advance the understanding of pain and ways to minimize it, thus enhancing the quality of life of the affected person (8).

METHODOLOGY

Study Design: Cross-sectional study

Sample Size: A sample size of 151cases was taken

Duration of study: The study took 4 months to complete after the approval of the synopsis.

Sampling Technique: A non-probability convenient sampling technique was used in the study to conduct the sample.

Study Setting: All patients will be chosen from

Ali Fatima hospital

Mayo hospital

Jinnah hospital

Inclusion:

Participants willing to participate in the study.

Age 15-30years.

Both Male and Female aged 15-30years

Athletes with anterior knee pain

Athletes participating in sports activities

Anterior knee pain from at least one month

Prolonged standing from continuous 7 to 8 hours

Exclusion Criteria:

- Neuromuscular disorders
- Psychologically disabled people
- Remarkable knee joint inflammation and effusion
- Knee surgery, knee physiotherapy and steroid injection
- Patients with a history of dislocation and direct trauma to the patella

Enrolment Methods: Individual participants who fulfilled the inclusion criteria were asked to sign a consent form. Participants received all the information they required regarding the study, its implications, and its goals and objectives. Only those individuals who gained a consent form were taken into the study, and personal information about them was kept confidential and used solely for research purposes.

Data Collection Methods: By inclusion or exclusion criteria and using scale (knee injury and osteoarthritis scale)

Procedure: The data was collected by using a questionnaire-based survey containing questions regarding musculoskeletal disorders. The permission letter along with the consent form, both in English, was given, and the study process began after the consent was signed by the students.

Data Collection Tools

- Standardized Questionnaire for the assessment of anterior knee pain was used for conducting the survey.
- Knee injury and osteoarthritis Questionnaire
- Numeric Pain Rating Scale
- Goniometer

Statistical analysis tool: Data will be analyzed by using SPSS version 2023. The numerical data like age will be presented in the form of mean + SD. Categorical data like gender group will be presented in the form of frequency (Percentage). A p-value of less than and equal to 0.05 will be considered significant.

Ethical Consideration:

Consent was obtained from the patients, through the assurance that their data will only be used only for research purposes.

The dignity of the participants will be prioritized.

No harm will be subjected to any participants of the research.

RESULTS

The study included a total of 151 participants, with one missing value. The mean of the participants was 22.6755, with a standard deviation of 4.78546.

(Table 1)

Table 1: Number of participants

Number of participants		
N	Valid	151
	Missing	1
Mean		22.6755
Standard Deviation		4.78546

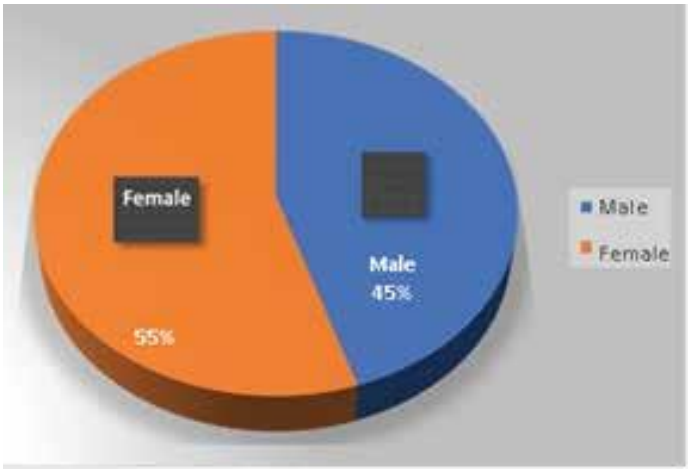


FIGURE 1 Gender distribution of participants

Fig 1 shows that among the participants in the study, 45% were male and 55% were female, with a total of 151 individuals. This indicates a slightly higher representation of female participants, accounting for the majority of the sample. The gender distribution of the participants provides valuable insights into potential gender-specific patterns or considerations when interpreting the study's findings (9).

A descriptive statistical analysis of KOOS questions is reported as follows. It indicates the effect of patellofemoral pain syndrome affecting the quality of life of subjects. A larger value of standard deviation is seen, which means the data is widespread. (Table 4.2)

Table 2: Descriptive statistical analysis

Variables	No. of participants	Mean	Standard Deviation
Level of education of participants	151	2.0795	±0.79602
How often is your knee painful?	151	1.9338	±1.15856
Pain twisting or pivoting on your knee?	151	1.3775	±0.64023
Pain during bending knee fully?	151	1.5702	±0.67140
Pain while walking on flat surface?	151	1.2848	±0.46730
How severe is your knee stiffness after sitting, lying or resting later?	151	1.8278	±0.70011
Do you have swelling in descending in the day?	151	1.7483	±0.78501
Do you feel grinding or hear clicking or other noise?	151	1.5762	±0.79530
Can you straighten your knee?	151	1.5695	±0.69771
Pain while sitting?	151	1.7020	±0.59771
Pain while ascending of stairs?	151	2.0066	±0.66830
Difficulty in raising from chair?	151	1.9801	±0.57120
Difficulty in standing?	151	1.8344	±0.58230
Difficulty in bending to floor picking up an object?	151	1.8940	±0.55561
Difficulty getting in and out of the car?	151	1.9272	±0.53040
How often are your knee problems?	151	1.7682	±0.64749
In general, how difficulty do you have with your knee?	151	1.9073	±0.58139
Pain while going up or down stairs?	151	1.9139	±0.76542

1. Level of education of participants:

The mean level of education was 2.0795, with a standard deviation of 0.79602.

2. How often is your knee painful?

Participants reported a mean score of 1.9338, indicating that knee pain is experienced occasionally. The standard deviation was 1.15856, suggesting variability in pain frequency among participants.

3. Pain twisting/pivoting on your knee:

The mean score for pain during twisting or pivoting motions was 1.3775, indicating mild discomfort on average. The standard deviation was 0.64023, suggesting some variability in the severity of pain experienced.

4. Pain bending knee fully:

Participants reported a mean score of 1.5702, indicating mild pain when bending the knee fully. The standard deviation was 0.67140, suggesting some variation in the degree of pain experienced (10).

5. Pain while walking on a flat surface:

Participants reported a mean score of 1.2848, indicating mild pain while walking on flat surfaces. The standard deviation was 0.46730, suggesting relatively low variability in pain levels during walking (11).

6. How severe is your knee stiffness after sitting, lying, or resting later?

Participants reported a mean score of 1.8278, suggesting mild to moderate knee stiffness after periods of inactivity. The standard deviation was 0.70011, indicating some variability in the severity of stiffness experienced.

7. Do you have swelling descending during the day?

The mean score for swelling was 1.7483, indicating mild swelling that descends during the day. The standard deviation was 0.78501, suggesting variability in swelling severity among participants.

8. Do you feel a grin? ding or hear a clicking or other noise

Participants reported a mean score of 1.5762, indicating occasional perception of grinding, clicking, or other noises in the knee. The standard deviation was 0.79530, suggesting variability in the occurrence of

these symptoms.

Can you straighten your knee?

Participants reported a mean score of 1.5695, suggesting mild difficulty in fully straightening the knee. The standard deviation was 0.69771, indicating some variation in the degree of difficulty experienced.

Pain while sitting:

Participants reported a mean score of 1.7020, indicating mild pain while sitting. The standard deviation was 0.59771, suggesting relatively low variability in pain levels during sitting.

Pain while ascending stairs:

Participants reported a mean score of 2.0066, indicating moderate pain when ascending stairs. The standard deviation was 0.66830, suggesting some variability in pain levels during stair climbing.

Difficulty in raising from a chair:

The mean score for difficulty in rising from a chair was 1.9801, suggesting mild difficulty on average. The standard deviation was 0.57120, indicating some variation in the level of difficulty experienced.

Difficulty in standing:

Participants reported a mean score of 1.8344, indicating mild difficulty in standing. The standard deviation was 0.58230, suggesting relatively low variability in the level of difficulty experienced.

Difficulty in bending to the floor to pick up an object:

The mean score for difficulty in bending to the floor and picking up an object was 1.8940, suggesting mild difficulty on average. The standard deviation was 0.55561, indicating some variation in the level of difficulty experienced.

Difficulty getting in and out of the car:

Participants reported a mean score of 1.9272, indicating mild difficulty when getting in and out of the car. The standard deviation was 0.53040, suggesting relatively low variability in the level of difficulty experienced.

How often are your knee problems?

Participants reported a mean score of 1.7682, suggesting occasional knee problems on average. The standard deviation was 0.64749, indicating some variability in the frequency of knee issues among participants.

In general, how difficult do you have with your knee:

The mean score for overall difficulty with the knee was 1.9073, indicating mild difficulty on average. The standard deviation was 0.58139, suggesting some variability in the level of difficulty experienced.

Table 3. presents the correlation between Anterior knee pain scale and knee pain-related quality of life. The results show that there is a positive strong correlation between the aforementioned variables as r=0.882. P-value<0.05 shows that the correlation is significant. Hence it can be deduced that the lower the Anterior knee pain scale score, the worse will be the quality of life and vice versa.

DISCUSSION

The results of this study suggest that the highest incidence of knee pain was recorded in the participants aged 17 to 20 years, and females had a slightly higher incidence of knee pain as compared to males. The pain was worse during stair climbing and kneeing, and therefore, these are some of the things that can cause difficulties for an individual with PFPS (12). This corresponds with earlier findings indicating that knee pain poses a considerable detrimental effect on the degree of functioning and exercise involvement, which has been more apparent in the younger population. The study also established that people in the youngest age group of 27 years had a slightly lower prevalence rate of knee pain at 9.9%. From these findings, it can be inferred that younger persons are the most likely to experience knee pain perhaps because of the rigorous activities that the age group engage in during adolescence and early adulthood (12)

Besides establishing that there are differences in the prevalence of knee pain among the genders, the study also contributes to the understanding of the effects of knee pain on sports and general mobility (13). Some previous work has demonstrated that women, especially athletes including basketball players, are more prone to develop PFD than men. However, the current study advanced these findings by involving participants who are both athletes and non-athletes, which helped to understand knee pain in various people in the general population (14). This approach helps capture how knee pain impacts people with different activity levels and can contribute to enhancing prevention and treatment strategies.

However, there are some limitations of this study, which have to be noticed: It is important to note that all the participants were selected from Lahore, Pakistan thus this study's results may not be generalized to other regions or with other populations. It is also important to note that this study used a cross-sectional design, which only allows examining relationships rather than proving cause and effect relationships, therefore, more research is needed to understand the factors leading to knee pain. Furthermore, employing self-administered questionnaires opens up the potential for bias, therefore, this might either inflate or deflate the prevalence rates and other associations between knee pain and the identified risk factors. Subsequent research should target more culturally and ethnically diverse samples and employ longitudinal designs to elucidate the longi

tudinal impact of knee pain on physical activity and sports.

CONCLUSION

In conclusion, the analysis of knee pain prevalence in different age groups has provided valuable insights into the occurrence of knee pain among young adults. The study revealed a prevalence rate of 11.8% for the age group of 18 years and 9.9% for the age group of 27 years. These findings indicate that knee pain can indeed occur in young adults and should not be dismissed as a condition solely associated with older individuals. The results highlight the importance of recognizing and addressing knee pain in younger age groups to ensure early intervention and appropriate management. Further research is warranted to understand the underlying factors contributing to knee pain in young adults and develop targeted prevention and treatment strategies. By recognizing the prevalence of knee pain in this demographic, healthcare professionals can work towards improving the quality of life and overall well-being of young adults affected by knee pain (15-20).

ACKNOWLEDGEMENT: None

CONFLICT OF INTEREST: None

GRANT SUPPORT AND FINANCIAL DISCLOSURE: None.

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Authors Contributions:

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Mahnoor Tayyab: Design of the work and the acquisition. Drafting the work. Final approval of the version to be published.

Submitted for publication: 28-04-2024
Accepted after revision: 10-05-2024

Original Article

Open Access

Effects of transformational leadership style based on educational intervention regarding knowledge of head nurses for improvement of job performance with Metabolic syndrome

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ABSTRACT

Background and Objectives: Transformational leadership skill (TLS) plays a crucial role in hospital management and administration. Unfortunately, healthcare provides (HCPS) lack the essential awareness of transformational leadership skill (TLS). There is a dire need to adopt different strategies to improve their knowledge and skills. To assess the improvement in the knowledge and skill about transforaminal leadership among head nurses after intervention of transformational leadership.

METHODOLOGY: A quasi-experimental study included 30 head nurses, designated with a multi stage cluster random sampling technique. 4 months of structured session were organized in two shifts (morning and evening). Pertinently, pre intervention and post intervention were organized for 4 months for i.e. 6 hours per week, 1 hours per day.

RESULTS: The present study showed that transformational leadership knowledge and skill have a significant impact on head nurses' performance. Insufficient pre intervention scores of the study participants explain inadequate knowledge. After the 4 months (one hours/per day) sessions, there was a highly significance improvement in the knowledge 88.5% and skills ($P<0.001$), df = 30 of head nurses regarding transformational leadership.

CONCLUSION: The current study show that head nurses had inadequate knowledge regarding transformational leadership. The knowledge was significantly improved after intervention of transformational teaching and training session. The addition of consistent training programs in the curriculum may ensure leadership skill to enhance the quality of nursing care as well as the commitment of employes. There for, it is concluded that knowledge and skill are significant predictors of the head nurses job performance.

KEYWORDS: Transformational leadership, head nurses, knowledge

INTRODUCTION

Effective leadership is fundamental in the healthcare sector to ensure the delivery of optimal patient care and to achieve organizational success. Leaders who are adaptable, innovative, and have a dynamic approach can drive improvements in system effectiveness, ultimately leading to better patient care and organizational productivity (Hargett et al., 2020). In the healthcare sector, nurses stand as the frontline caregivers, serving as the primary point of contact for patients and orchestrating the delivery of care.

Among the different leadership styles and practices, transformational leadership is the most prevalent in the nursing field. This relational style fosters trust and respect between professionals and their leader, inspiring them to exceed formal expectations to meet organizational objectives (Afsar & Umrani, 2020). A transformational leader is someone who develops future vision, innovates, and inspires staff to achieve organizational goals (Mushtaq et al., 2024).

Transformational leadership has emerged as a key leadership style for enhancing the proficiency and efficiency of nurses in healthcare organizations. The American Organization of Nurses Executives (AONE) states that transformational leadership is the preferred style for nurses, believing that such leaders play a crucial role in strengthening health systems globally. Transformational leadership is characterized by the 5Is: idealized influence, idealized behavior, inspirational motivation, intellectual stimulation, and individualized consideration (Moghadam et al., 2020).

How to cite this: Rehman M, Zaman H, Habiba U. Effects of transformational leadership style based on educational intervention regarding knowledge of head nurses for improvement of job performance. International Journal of Healthcare Profession. 2024; 1(2):36-41

Vol. 01, Issue 02, April-June, 2024

The impact of transformational leadership intervention on head nurses working in hospitals is a complex and multifaceted area that requires comprehensive understanding. By delving into recent research findings, this study aims to provide a holistic view of the influence of transformational leadership on nurses' job satisfaction, patient care quality, and organizational dynamics. The insights gathered from this investigation can contribute to the development of effective leadership strategies tailored to the unique demands of healthcare environments (Asif et al., 2019).

Objective: To assess the effects of transformational leaderships styles among nurse leader according to effects of transformational leadership style based educational intervention regarding knowledge of head nurses for improvement of job performance.

METHODOLOGY

Study design: A quasi-experimental study design could be suitable, specifically a nonrandomized controlled trial with pre-and post-tests.

Study Setting: The study was be conducted in Ali Fatima Hospital Lahore.

Duration of Study: This study was completed within 5 months after receiving approval letter on the ethical review committee. 5 months (12 February 2024- 10 June 2024).

Sample Size: Sample size of 30 head nurses was calculated with 95% confidence level

Sampling Technique: Convenient sampling was used for nurses can be attributed to the ethical considerations and availability of participants in each setting.

Study Population: Target population of the present study were Pakistani nurses (clinical nurses) who are employed at Ali Fatima Hospital, Lahore.

Sample Selection:

Inclusion criteria:

• Currently holding a leadership position (e.g., head nurse, nurse manager, or department head) in a private hospital in Pakistan.

• Having at least 5 years of experience in nursing leadership roles.

• Responsible for leading nursing teams and making decisions that impact patient care.

• Willing to participate in the research study and provide informed consent.

Exclusion criteria:

• Not currently working in Ali Fatima hospital.

• Less than 5 years of experience in nursing leadership roles.

• Not holding a leadership position (e.g., staff nurse, nurse educator, or researcher).

• Not willing to participate in the research study or unable to provide informed consent.

• Select a sample of head staff nurses who meet the inclusion criteria and provide informed consent.

Study Tool:

Data Collection Tools: The following tools were used by the researchers for data collection:

I. Transformational leadership questionnaire (Knowledge related questionnaire)

II. Nurses' Job Performance (Questionnaire)

Tool I: Transformational leadership questionnaire (Knowledge related questionnaire)

Transformational leadership questionnaire was related to multiple choice question was structure by the researcher based on the review of related material. Questionnaire will be consisted on 10 multiple choice questions.

Tool II: Nurses' Job Performance (Questionnaire)

Nurse job performance was evaluated with observational questionnaire to evaluate job performance of staff nurses.

Data collection procedure:

1. For Head Nurses: Pre data was collected before intervention transformational leadership then after 16 weeks data was collected immediate after intervention.

2. For Staff Nurses: Pre data was collected though observation questionnaire from staff nurses before intervention and then after 04 months, data was collected from staff nurses with the same instruments. Observation check list was used for the collection of job performance of staff nurses.

Method for collection of Data: The head nurses were grouped together according to their department location. Sixteen head nurses were in one group and ninety-six in 16 groups. Researcher was collected the data from both categories of nursing cadre such as head nurses and staff nurses.

Data analysis procedure:

Data were collected through structured questionnaire and analyzed by using statistical package for social science (SPSS) version 25 software. Descriptive statistics was displayed in frequency, percentage, mean, and standard deviation. The paired sample t test was used to compare the mean of one group. Paired samples t test was used to analyze the data in pre and post difference. A value of $p < 0.05$ was measured significant.

Ethical Consideration:

• Informed consent: Prior informed consent will be obtained from all participants

• Confidentiality: Participants confidentiality and

anonymity will be strictly maintained

• Ethical: Approval: Ethical clearance will be sought from the relevant institutional review board.

• The protentional benefits of the study for the participants to increase the knowledge, skill and job performance regarding transformational leadership.]

RESULTS

In this chapter data analysis and data interpretation was discussed by the tables and graph, shows that the demographics, independent and dependent variables.

Table 1 (Demographic characteristics of participants (Head Nurses n=10) Age of Head Nurses)shows that 40% research participants were between the age of 26-30 years were between 20-25 years of age group, 20.0% were between 31-35 years of age and 10.0% were between 36 years and above age of group.

Table 2 (Distribution of Research Participants with respect to Departments) shows that 20% research participant belong to Emergency Department, every 10% participant belong to Medical ICU and others departments.

Table 3 (Educational Status of Research Participant) shows that in relation to qualification 50% head nurses have bachelor degree in nursing,

40% research participants are diploma holder, and 10.0% research participants have master degree. Table 4 (Experience of research Participants) indicate that 40% head nurses had their leadership experience between 6-10 years, 30% research participant had their leadership experience between 1-5 years, and 20.0% head nurses had their leadership experience between 11 years and above.

Table 5 (Statistical of Head nurses Knowledge Perception about Transformational Leadership Skills) A paired-samples t-test was conducted to evaluate the impact of the Head nurses knowledge perception about Transformational Leadership Skills. A very highly significant mean difference was found between pre-knowledge and post-knowledge scores of head nurses on Idealized Influence (II), t (10) = 0.00, p =0.000 with Mean and SD (0.40 + 0.516 vs 1.00 + 0.000) for I realize that others are proud to be associated with me, t (10) = - 2.236, p =0.000 with Mean and SD (0.40 + 0.516 vs 1.00 + 0.000) for I do well for the team beyond my interest., t (10) = -2.236, p =0.000 with Mean and SD (0.70 + 0.4.834 vs 0.90 + 0.316) for I perform in a way to maintain the respect of others. It is evident from he above results hat Idealizes Influence (II) has a significant effect on head nurses about transformational leadership skill.

A very highly significant mean difference was found between pre-knowledge and post-knowledge scores of head nurses on Inspirational Motivation (IM), t (10) = -3.674 , p =0.000 with Mean and SD (0.30 + 0.483 vs 0.90 + 0.316) for I talk optimistically about the future, t (10) = -3.000, p =0.000 with Mean and SD (0.40 + 0.516 vs 0.90 + 0.316) for I provide recognition / rewards when others reach their goals, t (10) = -4.583, p =0.000 with Mean and SD (0.20 + 0.422 vs 0.90 + 0.316) for I help others finding purposeful meaning in their work. It is evident from he above results hat Inspirational Motivation (IM) has a significant effect on head nurses about transformational leadership skill.

A very highly significant mean difference was found between pre-knowledge and post-knowledge scores of head nurses on Intellectual Stimulation (IS), t (10) = -2.236 , p =0.000 with Mean and SD (0.40 + 0.516 vs 0.90 + 0.316) for I satisfy when others meet agreed-upon standards, t (10) = -4.586, p =0.000 with Mean and SD (0.20 + 0.422 vs 0.90 + 0.316) for I provide others with new ways of looking at puzzling the things. It is evident from he above results hat Intellectual Stimulation (IS) has a significant effect on head nurses about transformational leadership skill.

A very highly significant mean difference was found between pre-knowledge and post-knowledge scores of head nurses on Individual Consideration (IC), t (10) = -4.583, p =0.000 with Mean and SD (0.20 + 0.422 vs 0.90 + 0.316) for I manage time for teaching and training, and t (10) = -1.809, p =0.000 with Mean and SD (0.50 + 0.527 vs 0.90 + 0.316) for I entertain others as an individual rather than fellow of a team. It is evident from he above results hat Individual Consideration (IC) has a significant effect on head nurses about transformational leadership skill.

Table: Demographic characteristics of staff nurses

Demographic	F	%
Age		
20 - 25 years	11	55.0
26 - 30 years	6	30.0
31 - 35 years	2	10.0
36 and above	1	5.0
Department		
Medical ICU	3	15.0
Emergency department	4	20.0
Medicine ward	2	10.0
Surgical ward	3	15.0
Nephrology ward	2	10.0
Ophthalmology ward	1	5.0
Orthopedic ward	1	5.0
Pead's ward	3	15.0
Gynae ward	1	5.0
Total	**20**	**100.0**
Educational Status		
General Nursing (Diploma)	9	45.0
Bachelor of Science in Nursing	8	40.0
Master of Science in Nursing	3	15.0
Years of experience		
1 - 5 years	14	70.0
6 - 10 years	6	30.0
11 years and above	00	00.0

Table 5 shows that 55.0% research participants were between 20-25 years of age group, 30.0% were between 26-30 years of age group, 10.0% were between 31-35 years of age group, and 5.0% were between 36 years and above of age group.

Most of 20% the staff nurses were belong to Emergency department, 15% from Medical ICU, Surgical ward and Pead's ward; and 5-10% from other units of Ali Fatima Hospital.

Educational status in relation to qualification 45% staff nurses have diploma holder,40% have bachelor degree in nursing, and 15% have master degree holder.

Data indicate that 70% staff nurses had their charge nurse experience between 1-5 years, and 30% had their nursing experience between 6-10 years.

Table: Demographic characteristics of staff nurses

Job performance element	Before intervention Mean ± SD	After intervention Mean ± SD	t	p
1.The nurse-led educational programs in this hospital have improved my knowledge and skills	2.00 ± 1.026	4.30 ± 0.657	-7.667	0.000
2.I feel motivated to provide high-quality care as a result of participating in nurse-led educational activities	2.10 ± 0.968	4.20 ± 0.768	-7.0141	0.000
3. The transformational leadership style of nurse educators positively influences my work performance	2.05 ± 0.826	4.20 ± 7.68	-8.134	0.000
4. I believe that nurse-led education enhances teamwork and collaboration among nursing staff	2.15 ± 0.745	4.30 ± 0.657	-10.987	0.000
5. Participating in nurse-led educational initiatives has increased my job satisfaction	2.00 ± 0.649	4.40 ± 0.681	-10.790	0.000
6.I feel empowered to implement innovative practices in patient care due to nurse-led education	2.40 ± 0.503	4.80 ± 0.410	-15.771	0.000
7.The quality of patient care in this hospital has improved as a result of nurse-led educational programs	1.80 ± 0.834	4.50 ± 0.688	-10.699	0.000
8.I enable others to think about old problems in new ways	2.00 ± 0.973	4.40 ± 0.681	-9.037	0.000
9.I think intuitions is the best guide in making decision	1.75 ± 0.851	4.20 ± 0.616	-6.666	0.000
10.I tell others what to do if they want to be rewarded for their work	2.20 ± 0.1056	4.20 ± 0.768	-11.600	0.000
Total	**20.4500 ± 2.70429**	**43.5000 ± 3.79057**	**-19.500**	**0.000**

A highly statistically significant difference ($p < 0.000$) A paired-samples t-test was conducted to evaluate the impact of the intervention on staff nurses. A very highly significant mean difference was found between pre-intervention and postintervention scores of staff nurses on Ali Fatima Hospital, t (20) = -7.667, p =0.000 with Mean and SD (2.00 + 1.026 vs 4.30 + 0.657) for the nurse-led educational programs in this hospital have improved my knowledge and skills, t (20) = -7.0141, p =0.000 with Mean and SD (2.10 + 0.968 vs 4.20 + 0.768) for I feel motivated to provide high-quality care as a result of participating in nurse-led educational activities, t (20) = -8.134, p =0.000 with Mean and SD (2.05 + 0.826 vs 4.20 + 7.68) for the transformational leadership style of nurse educators positively influences my work performance, t (20) = -10.987, p =0.000 with Mean and SD (2.15 + 0.745 vs 4.30 + 0.657) for I believe that nurse-led education enhances teamwork and collaboration among nursing staff, t (20) = -10.790, p =0.000 with Mean and SD (2.00 + 0.649 vs 4.40 + 0.681) for Participating in nurseled educational initiatives has increased my job satisfaction, t (20) = -15.771, p =0.000 with Mean and SD (2.40 + 0.503 vs 4.80 + 0.410) for I feel empowered to implement innovative practices in patient care due to nurse-led education, , t (20) = -10.699, p =0.000 with Mean and SD (1.80 + 0.834 vs 4.50 + 0.688) for The quality of patient care in this hospital has improved as a result of nurse-led educational programs, t (20) = -9.037, p =0.000 with Mean and SD (2.00 + 0.973 vs 4.40 + 0.681) for I enable others to think about old problems in new ways, t (20) = -6.666, p =0.000 with Mean and SD (1.75 + 0.851 vs 4.20 + 0.616) for I think intuitions is the best guide in making decision, and t (20) = -11.600, p =0.000 with Mean and SD (2.20 + 0.1056 vs 4.20 + 0.768) for I tell others what to do if they want to be rewarded for their work.

DISCUSSION

Transformational leadership is a modern leadership style. In this style visionary leaders face challenges by challenges workers and take ownership of their work with wisdom. They play their role more than their performance beyond expectancy of institute is required. Therefore, transformational leadership interventional program has been accomplished for supporting head nurses to perform role of manager effectively and efficiently. Transformational leadership knowledge and skills intervention are support and encouragement for head nurses to perform mana

gerial role confidently and successfully.

The study has two magnitudes one is related to head nurses and other is linked with staff nurses job performance. Both nursing workforce has a crucial role in patient care therefore; transformational leadership style must be practiced by the nurses to overcome the health issues in clinical setting.

Current study revealed that there was statistical significant 91% improvement in the knowledge of head nurse (n=10) regarding transformational leadership at post- intervention program as compared to pre-intervention program. There was highly statistical difference among knowledge of head nurses. Most of the head nurses were diploma holder and they were very interested in this topic. Head nurses have ability to gain knowledge gain easily. The results were comparable with, how conducted study transformational leadership educational program for have a nurses and its effects on nurses job performance revealed that that there was statistical 74% improvement in knowledge of staff nurses (n=20) regarding transformational leadership at postintervention program.

A study of Abd – Elrhaman & Abd – Allag0, (2018) revealed that there was statistical 71.8% improvement in the knowledge of head nurses (n=103) regarding transformational leadership at post – intervention program as compared by 58.4 % result of the pre – intervention.

A study by LEODORO J. LABRAGUE, (2020) revealed that there was statistical 51% result of improvement in the job satisfaction of staff nurses (n=190) regarding transformational leadership at pre-intervention program as compared by 67% results of post intervention. (10-20)

CONCLUSION

Successful transformational leadership intervention by the researcher

- Improved knowledge and skills among head nurses post-intervention compared to pre-intervention
- Significant enhancement in transformational leadership knowledge and skills of head nurses' job performance post-intervention
- Post-intervention shows higher percentages, mean, and standard deviation compared to pre-intervention.

RECOMMENDATION:

The current study provides several recommendations based on its findings: Organize In-Service Training and Educational Programs: Hospitals should conduct regular in-service training and educational programs on transformational leadership for head nurses. These programs can help refresh and enhance the knowledge and skills of head nurses, enabling them to effectively lead and manage nursing teams.

Consider Training Courses as Prerequisite: Hospitals should consider making training courses on transformational leadership a prerequisite for head nurses before they assume leadership positions. This ensures that head nurses are equipped with the necessary knowledge and skills to excel in their roles from the outset. Replication of Research on Larger Sample Sizes: Further research should replicate the current study on a larger sample size to increase generalizability and validate the findings across a broader population of head nurses. Investigate Effects on Nurses' Working Behavior: Future research studies should investigate the effects of transformational leadership programs on the working behavior of nurses, particularly in tertiary care hospital settings. Understanding how these programs influence nurses' behavior can provide valuable insights for improving patient care and organizational outcomes.

Arrange Meetings for Discussion: Hospital administrators should arrange meetings with nurse leaders and staff nurses to discuss various challenges and programs faced in different departments. This collaborative approach fosters communication, promotes teamwork, and allows for the identification and resolution of issues affecting nursing practice.

In summary, these recommendations aim to further promote the adoption and implementation of transformational leadership practices among head nurses, ultimately enhancing patient care quality and organizational effectiveness in healthcare settings.

ACKNOWLEDGEMENT: None

CONFLICT OF INTEREST: None

GRANT SUPPORT AND FINANCIAL DISCLOSURE: None.

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Authors Contributions:

Maryam Rehman: Substantial contributions to the conception and design of the work.

Heera Zaman: Design of the work and the acquisition. Drafting the work.

Ume Habiba: Final approval of the version to be published.

Submitted for publication: 20-04-2024
Accepted after revision: 19-06-2024

Original Article

Prevalence of myopia in children aged 06 to 15 years playing video games and non-playing video games.

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ABSTRACT

Background and Objectives: : Myopia or short-sightedness is causing the reduction in far visual acuity. The burden of uncorrected myopia among our population is large and as effective interventions are available, early detection of myopia and its proper correction prevents visual impairment. Objective: To assess the prevalence of myopia in children aged 06 to 15 years playing and non-playing video games.

METHODOLOGY: In this cross-sectional study 78 children were registered & visual acuity of all the subjects was checked by using a distance smallest chart. Subjective refraction was done in the subjects having reduced visual acuity. Questions regarding playing and non-playing video games along with their duration were asked.

RESULTS: Out of 78 subjects, 53 played video games. Out of 53 children, 19 were found to have myopia and 25 not played video games, 2 subjects had myopia. The study showed that significant relationship between myopia and playing video games.

CONCLUSION: It is concluded that there is a significant association between myopia and playing video games in children, and this relationship needs to be further explored on a large scale.

KEYWORDS: Myopia, Video games, Visual Acuity.

INTRODUCTION

Myopia, or nearsightedness, is a refractory disorder in which light improperly convergence and focuses in front of the retina creating blurry vision of distant objects (1). It is a condition that results from the eye's optical machinery being far-fetched for the length of the eyeball. This can be caused by Alteration in the curvature of the cornea, the lens or an increase in the axial length of the eyeball. Myopia is commonly classified into different types: Special types are congenital, simple, and pathological (2).

Myopia is present at birth, and the common cause is increased axial length, which does not show much change with increasing age. Simple myopia is its most common type, which usually develops in childhood and reaches its peak by mid-adolescence (3). The symptoms vary from mild to moderate and usually do not worsen with time, especially after adolescence. There is also the pathological myopia: the patients with this form of the illness experience rapid myopia progression during children and teenagers, combined with high myopia degrees and complications: retinal separation, macular degeneration, and others diseases which threaten one's vision.

Myopia has been rising globally, and the primary cause is the new trends in lifestyle, including spending less time outdoors and more time using electronic devices. To support their observation they stated that epidemiological studies have demonstrated that children who play outdoors are less likely to become myopic; therefore, natural light and distance vision have a protective effect.

The signs of myopia include, getting blurred vision when looking at objects that are far away, having a feeling of strain on their eyes, and feeling uncomfortable when they are driving or watch films. In more severe conditions the patients get a perception of 'floaters' or night blindness by those changed retinas. Myopia is detected during examination, bycovering a large, pale optic disc with degenerative retinal changes in the pathological form of the disease (4)

Myopia can be treated by spectacles or contact lenses and medical treatments to rectify the sight can be done

How to cite this: Sarfraz M, Nafees K, Prevalence of myopia in children aged 6 to 15 years playing video games and non-playing video games. International Journal of Healthcare Profession. 2024; 1(2):42-45

Vol. 01, Issue 02, April-June, 2024

through refractive surgery Myopia has shown progression and thus there are ongoing experiments to halt its progression, especially in children (4).

Objectives

- To understand myopia as a refractive error, where light focuses in front of the retina, leading to blurred vision for distant objects.
- To identify the common causes of myopia, including an elongated eyeball, increased curvature of the cornea or lens, and genetic factors.
- To explore management options for myopia, such as corrective lenses, contact lenses, or refractive surgery, and prevention strategies like increased outdoor activity and reduced near work (4).

METHODOLOGY

Study Setting: The study was conducted in the 'Department of Ophthalmology' of Fatima Memorial Hospital Shadman, Lahore.

Study Population: The patient having myopia were included in the study.

Sample Size: A sample size of 78 patients selected from FMH eye OPD fulfilling inclusion criteria were included in the study.

Inclusion criteria

- Subjects age from 06 years to 15 years.
- Playing video games/Mobile games subjects.
- Non Playing video games/Mobile games subjects
- Both boys and girls subjects.
- Refractive errors only in myopic subjects.

Exclusion criteria

- Subjects less than 06 years and more than 15 years.
- Any other near work.
- Uncooperative patients.
- Surgically operated eyes.

Study Design

It was a cross-sectional, observational study (5)

Study Duration

The duration of the study was four months from 20 August 2018 to 20 December 2018.

Data Collection Instrument

A well-designed proforma comprising questions regarding demographic data, patient history and clinical examination was used to collect data (6)

Methodology

78 patients were presented to eye OPD of Fatima Memorial Hospital.

Informed consent was taken and demographic data was collected on a pre-designed proforma (6).

Visual acuity of both eyes was recorded monocularly by using Snellen's chart. Then pinhole test was performed. Then Auto Refracto-Keratometer (TOPCON) refraction was done, subjective refraction was performed and the prescription of glasses to subject having the myopia (7).

Ethical Issues

As it was an observational study there were no ethical issues or any religious barrier in this study. The verbal consent was taken from the patients (8).

Data Analysis

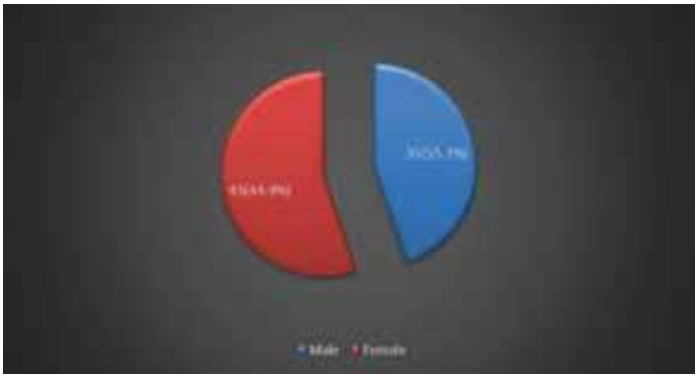
The data was entered and analyzed in the SPSS 23 version. All quantitative variables like age and visual acuity (V.A) were discussed in the Mean, ± Standard Deviation Form. All qualitative variables like gender, myopic and non-myopic were discussed in frequency or percentage form. Pie and bar charts were used to represent data (8).

RESULTS

The Study included 78 subjects who were presented with eye OPD. Out of these 35 (44.9 %) were male and 43 (55.1%) were female. The following table shows the gender distribution of total subjects (9).

Table No 1: Gender distribution

Gender	Frequency	Percentage
Male	35	44.9%
Female	43	55.1%
Total	78	100%



Graph No 2: Gender distribution

The data was divided into different sections containing demographic, presentation and association profiles (10). We divided the children into basic two groups who played or not play video games. Out of a total of 78 children, 53 (67.9 %) who played video games and the remaining 25 (32.1 %) did not play video gamThe following wing table shows the children who played or did not play video games (11).

Table 2: Children played and not play video game

Category	Frequency	Percentage
Played video games	61	79%
Not played video games	16	21%
Total	77	100%

Visual acuity of both eyes was recorded monocularly by using Snellen's chart. Then pinhole test was performed. Then Auto Refracto-Keratometer (TOP-CON) refraction was done, subjective refraction was performed and the prescription of glasses to subject having the myopia (7).

Ethical Issues

As it was an observational study there were no ethical issues or any religious barrier in this study. The verbal consent was taken from the patients (8).

Data Analysis

The data was entered and analyzed in the SPSS 23 version. All quantitative variables like age and visual acuity (V.A) were discussed in the Mean, ± Standard Deviation Form. All qualitative variables like gender, myopic and non-myopic were discussed in frequency or percentage form. Pie and bar charts were used to represent data (8).

Table 3: Prevalence of myopia P Value=0.013

	Myopia - Yes	Myopia - No	Total
Playing video games	19 (24.4%)	34 (43.6%)	53 (67.9%)
Non-playing video games	2 (2.6%)	23 (29.5%)	25 (32.1%)
Total	21 (26.9%)	57 (73.1%)	78 (100.0%)

DISCUSSION

Myopia is a type of refractive error in which parallel rays of light coming from infinity focus in front of the retina when accommodation is at rest (12). It is a very common cause of visual impairment throughout the world. Early onset of myopia is associated with high myopia in adult life (13). High myopia is a significant public health problem because of its association with an increased risk of several ocular diseases including cataracts, glaucoma, retinal detachment, myopic retinal degeneration, visual impairment, and blindness (14). Therefore, it is important to investigate the reasons for the increase in the prevalence of myopia and to identify the possible risk factors. This would point to possible directions to take for preventing myopia in the future (13).

This study was conducted to find out the prevalence of myopia either in playing video games children or in non-playing video games children. 53/78 (67.9 %) were playing video games and 25/78 (32.1 %) were not playing video games (15). The results showed that the prevalence of myopia was higher in children who played video games. 19/53 (24.4 %) and the prevalence of myopia was less in children who did not play video games 2/25 (2.6 %).

The study also reveals that the proportion of myopia is higher in children, who play video games for more than two hours per day than in children playing video games for two hours or les (16)s.

This study is by no means an exhaustive study owing to lack of time, manpower and other resources (17). It is basically a cross-sectional survey, carried out to gauge the gravity of the situation. It is intended to serve as a guideline for further extensive studies on a large scale, especially in collaboration with the professionals engaged in Community Ophthalmology Programs (18).

The results of a study of Faisal Rasheed et al, 2010 conducted a study on "refractive errors among children aged 6-15 years playing video games" revealed that 18 out of 100 children had refractive errors, mainly myopia 13 (72.22%), hyperopia 3 (16.7%) and astig-matism 2 (11.1%). This study showed no significant relation between refractive error with their habit of playing different types of video games. However, there was a significant relation between refractive error and duration of playing video games (19-20).

CONCLUSION

Myopia is more prevalent in children playing video games as compared to children not playing video games and the p-value is less than 0.05, so there is a significant association between myopia and children playing video games.

ACKNOWLEDGEMENT: None

CONFLICT OF INTEREST: None

GRANT SUPPORT AND FINANCIAL DISCLOSURE: None.

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Authors Contributions:

Muhammad Sarfraz: Substantial contributions to the conception and design of the work.

Khurram Nafees: Design of the work and the acquisition. Drafting the work. Final approval of the version to be published.

Submitted for publication: 24-04-2024
Accepted after revision: 20-06-2024

Original Article

Open Access

Barriers to Accessing Eye Care Services Among Marginalized Groups in Union Council Kili Shiekhan, Tehsil Chiltan, Quetta

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ABSTRACT

Background and Objectives: Barriers like as cost and finance, communication, trust, fear, lack of knowledge and awareness, distance and transportation, race, service-related, problems with glass and optical devices, lack of time, previous experience etc determination of eye care services among marginalized group in Quetta. Barriers to Accessing Eye Care Services Among Marginalized Groups in Union Council Kili Shiekhan, Tehsil Chiltan, Quetta

METHODOLOGY: After taking consent and recording demographic details, a questionnaire was used to assess barriers to eye care services on a 20 points questionnaire, in the community.

RESULTS: It has been shown in our finding that among total of 400 participants (289 males, 111 females), mean age 40 years, (38.5%) educated and (61.5%) illiterates. Major barriers are five, which are more expensive (65%) and (62.5%) affordability issues, there were (50.75%) communication gaps, (70%) have a fear of surgery, (85.75%) have distance issues, transport facilities availability(51.75%) and (62%) don't have knowledge and awareness of eye care services,(53.25%) have spectacle cosmetic trouble, (42.25%) comfortable with spectacle, (65.5%) have managing problem of spectacles, (25.25%) gender biases exists and (91.75%) have schedule feasibility for visit hospitals, (36.25%) misbehaviour perception from hospitals staff and (62,25%) satisfied from hospitals staff and (77.5%) satisfied about treatment services, (62,25%) service availability and (76.5%) not felt racism.

CONCLUSION: This study aimed to highlight the barriers to accessing eye care services among marginalised groups. It is concluded from this research that most people have cost and finance issues regarding eye care services, there is a communication gap among them and fear of surgery is also found as an obstacle in accessing eye care facilities. Distance from hospitals and relatively low knowledge and awareness about facilities and services regarding eye care are playing a great role. Spectacles as cosmetic issues and management of spectacles are also found as barriers. On a minor scale race and gender favouritism hinder to access eye care services.

KEYWORDS: Barrier, Marginalized group, Eye care service.

INTRODUCTION

There are a number of challenges that people face when trying to access services of an ophthalmologist – these challenges are multiple and can have social, economical, cultural or systematic nature. Such barriers can greatly affect people's access to timely and enough treatment especially from the minority group (1).

Trust Issues: Another is mistrust of the providers of this services another common barrier is perceived powerlessness. For example, elderly African Americans have complaints about the doctors' intentions and insist that the doctors are in business to make money out of the patients. It also results in late presentation to clinic and non-adherence to recommended health centra and management of both common and complicated health conditions such as cataracts. Patients' loyalty to physicians and their referrals is firmly connected with the faith in the doctor-patient relationship to go for such tests and adhere to particular regimens (2).

Fear: Another reason is fear, especially regarding the results of surgery operations they are going to undertake. Most patients develop a lot of anxiety expecting that they will lose their sight or their condition can be made worse when they undergo surgeries such as cataract surgeries. Some of the patients for example are

How to cite this: Ali S, Saeed A, Ali M, Amir M, Ali Z. Barriers to Accessing Eye Care Services Among Marginalized Groups in Union Council Kili Shiekhan, Tehsil Chiltan, Quetta. International Journal of Healthcare Profession. 2024; 1(2):46-51

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afraid of surgery because their relatives have severally narrated their ordeals; despite of positive experiences, fear is always a barrier to required treatment (3).

Transportation and Accessibility: There are such factors as geographic isolation, limited access to care because of distance and lack of transportation, and these factors are especially true when it comes to rural population. Patients may have to travel several kilometres to access the eye care services, this may act as a barrier to people with a mobility or financial back drop. Regarding the ideas for a long-term solution to deliver eye care services more readily to rural consumers, mobile clinics and community outreach programs have been cited (4).

Lack of Knowledge and Awareness: The major breaches encountered are for instance, a great number of citizens do not have any information regarding eye health and existing services. Even when patients have a medical condition that makes them a candidate for an eye exam, they may not know they need one or that there are treatments for conditions such as refractive errors or low vision. This poor knowledge can lead to late presentation of the disease and therefore poor management of the condition (5).

Economic Factors: Another reason why patients are unable to access eye care is through the cost of eye care. Most of the people for instance those in the rural and low income bracket cannot afford to afford the extras like glasses, treatments or surgeries. This is highlighted for the developing countries' families where health needs may be low on their priority relative to the basic needs. Also, it means that the individuals will not receive important eye care since they will spend considerable amounts of money on transportation to reach the eye clinics (6).

Gender and Social Stigma: Cultural restriction also used as a barrier on eye care attainment for women from some cultures or parts of the world. Women and particularly those from rural or traditional areas might lack all the necessary means for accessing proper healthcare, or diminished social status might make them hide their condition and diseases. Access is also limited by prejudice against transgender and other minorities, and/or lack of insurance coverage (6).

Age and Disability: This is because older people and people with disabilities are disadvantaged when it comes to eye care. Such populations may be more prone to higher rates of pathogen impacts on their health and may comprise escalated aspects in terms of care reception. However, they are also at the same time also likely to make lesser use of services due to disability, mobility, or information constraints (7).

Service-Related Barriers: While many of the existing investigations are carried out to examine the personal factors, of particular importance are service-related barriers including the availability of healthcare services, the level of access as well as the costs associated with these services. It means they have to wait long, there are few clinics, specialized professionals or no staff at all, which also hinders a person from getting their due care (8).

Therefore, it can be recommended that the identified barriers to eye care should be solved by implementing a step by step approach. This comprises the following; enhancing friendly quality relationships between the physicians and patients, increasing awareness on eye diseases, tackling challenges in transport and cost questions and making sure there is a balanced provision of services to the minority groups. The barriers to access to comprehensive eye care services as well as the integration of primary eye care services into other health care systems can be eased to avoid more avoidable blindness(8).

Objectives:

- To ensure that there can be a direct communication between the patient as well as the health care provider.
- To enhance transportation, cost and awareness of the eye care services.
- For effective provision of eye care to the minority and vulnerable groups of the population.

Rationale:

Eliminating barriers to access is important in order to promote the health of all people especially the marginalized and vulnerable populations. They include factors such as lack of trust, fear of procedures, and economic or geographical constraints that keep many away from seeking care. Such as mobile clinics, financial support, and awareness can mitigate these challenges. The need to undertake fair distribution to the several categories of people, especially women, the elderly and the disabled should be made because this will enhance improved health and wellbeing among different categories of people(9).

METHODOLOGY

Study design; Cross sectional study

Study setting / location; Union Council kili Shiekhan, Tehsil Chilton Quetta

Study Population; Marginalized groups

Study Area: Union Council kili Shiekhan

Duration of study; was six months

Sample size; 400 people
Sampling technique; Cluster random sampling
Sampling Unit; Household
Data Collection Tool; Questionnaire
Sample selection;
Inclusion;

- Age more than 20.
- All Marginalized people.
- Who was willing to participate.

Exclusion;

- Age less than 20.
- All elite/rich people.
- Who was not willing to participate.

RESULTS

In present cross-sectional study, among 400 participants 289(72.25%) respondents were males and 111(27.75%) were females, as shown in figure no.01(10).

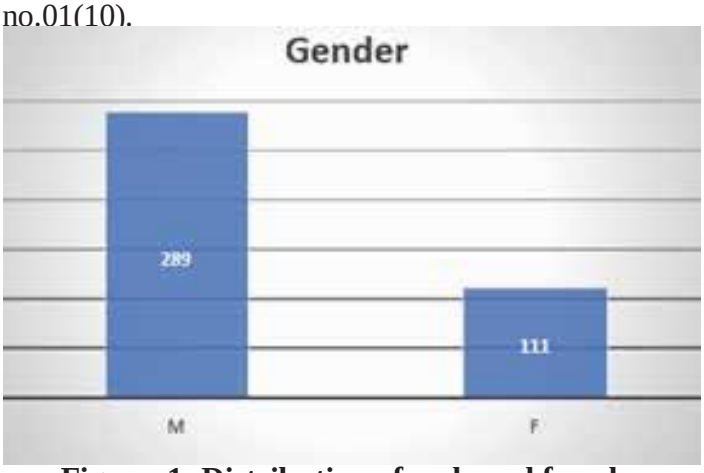


Figure. 1: Distribution of male and female.

In present cross-sectional study, among 400 participants 232(58%) respondents age were less than 40 years, while 168(42%) others age were greater than 40 years, as shown in figure no.02(11).

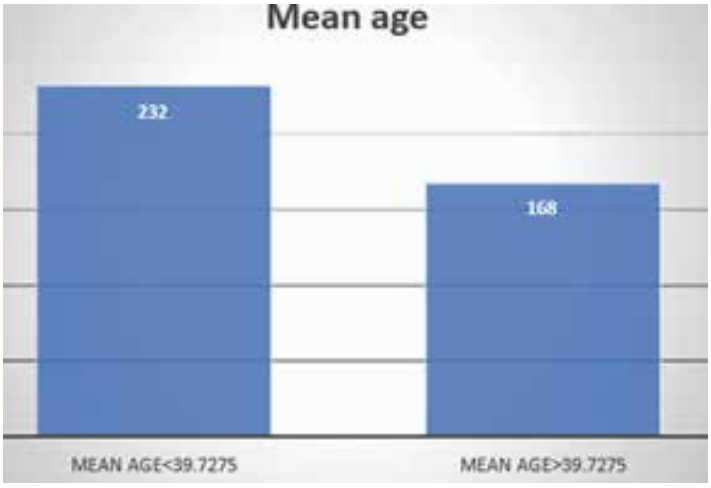


Figure. 2: Frequency chart of Age.

In present cross-sectional study, among 400 participants 154(38.5%) respondents were educated while 246(61.5%) were non-educated or illiterate, as shown in figure no.03.

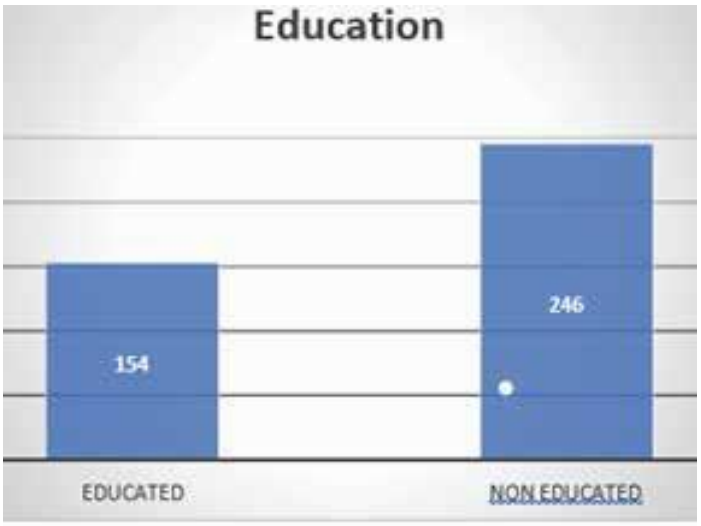


Figure.3:Frequency chart of education.

A) Expensive

In present cross-sectional study, among 400 participants 260(65%) have agreed that eye care services are expensive and 139(34.75%) were have no idea of expensiveness of eye care services while 1(0.25%) other were not sure, as shown in figure no.04(10).



Figure.4: Frequency chart of cost and finance.

B) Affordability

In present cross-sectional study, among 400 participants 149(37.27%) were have mentioned that they can afford eye care services and 250(62.5%) were mentioned that they can't afford eye care services while 1(0.25%) other were not sure, as shown in figure no.05.

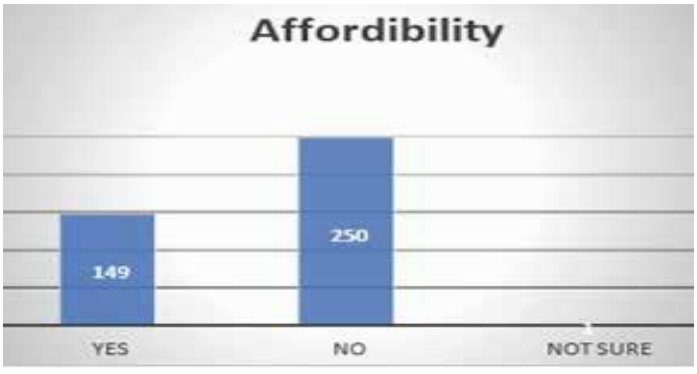


Figure.5: Frequency chart of cost and finance.

In present cross-sectional study, among 400 participants 203(50.75%) were mentioned that communication is a problem for having eye care services and 196(49%) were mentioned that communication is not a problem to have eye care services while 1(0.25%) other were not sure, as shown in figure no.06(12).

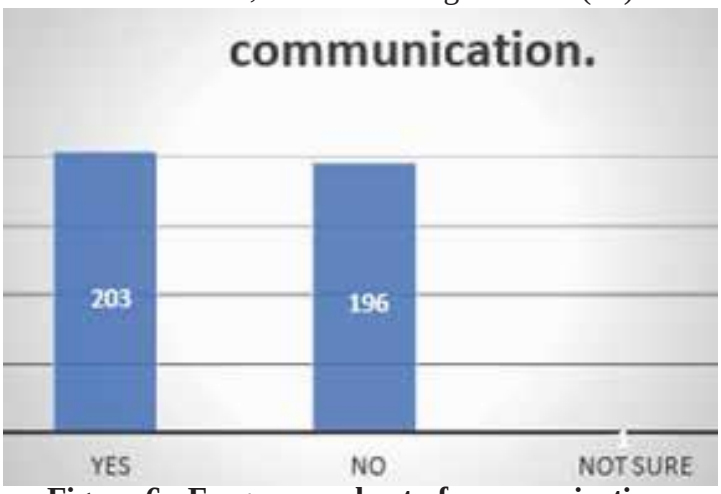


Figure.6: Frequency chart of communication.

In present cross-sectional study, among 400 participants 337(84.25%) were mentioned that they trust upon eye care provider and 50(21.75%) were mentioned that they don't have trust upon eye care provider while 13(3.25%) other were not sure, as shown in figure no.07

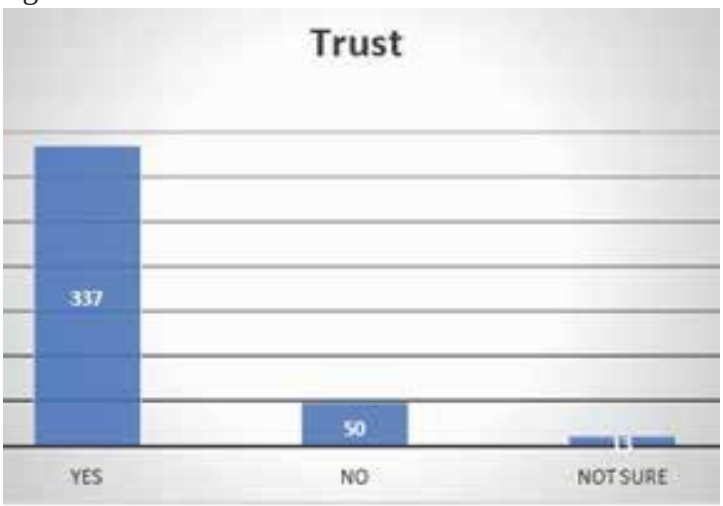


Figure7: Frequency chart of trust.

A) Fear of surgery.

In present cross-sectional study, among 400 participants 280(70%) were mentioned that they have fear of surgery and 108(27%) were mentioned that they don't have fear of surgery, while 12(3%) other were not sure, as shown in figure no.08.

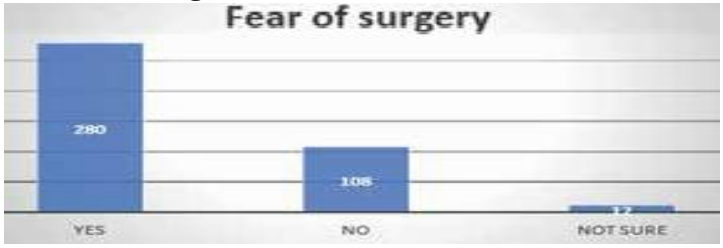


Figure. 8: Frequency chart of Fear.

B) Fear of Infection

In present cross-sectional study, among 400 participants 23(5.75%) were mentioned that they have fear of infection and 87(21.75%) were mentioned that they don't have fear of infection, while 290(72.5%) other were not sure, as shown in figure no.09(13).

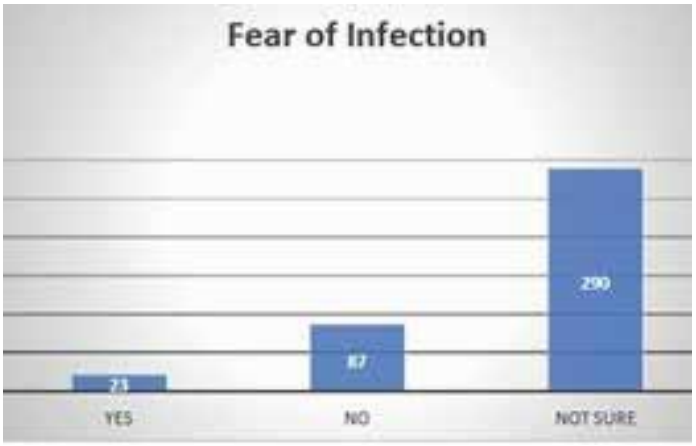


Figure. 9: Frequency chart of Fear.

Results Summary

It has been shown in our finding that among total of 400 participants (289 males, 111 females), mean age 40 years, 154(38.5%) educated and 246(61.5%) illiterates. Major barriers are five, which are more expensive 260(65%) and 250(62.5%) affordability issues, there were 203(50.75%) communication gaps, 280(70%) have fear of surgery, 343(85.75%) have distance issues, transport facilities availability 207(51.75%) and obstacle 149(37.25%). 148(37%) were aware about eye care services, 248(62%) don't have knowledge and awareness of eye care services, 213(53.25%) have spectacle cosmetic trouble, 169(42.25%) comfortable with spectacle, 262(65.5%) have managing problem of spectacles, 101(25.25%) gender favoritism exist and 292(73%) not felt gender favoritism, 123(30.75%) vulnerable group which faces service access problem. 367(91.75%) have schedule feasibility for visit hospitals, 145(36.25%) misbehavior perception from hospitals staff and 249(62,25%) satisfied from hospitals staff and 310(77.5%) satisfied about treatment services, 319(62,25%) service availability, 83(20.75%) felt racism and 306(76.5%) not felt racism.

DISCUSSION

Several challenges limit affordable and effective access to eye care services in LMICs: financial accessibility, low-level awareness, logistical factors, and phobia of surgeries(14). The published investigations indicate that a large number of the population in these areas experiences problems in receiving the

required eye care, and the identified prerequisites include high costs, transport accessibility, and significant distances to healthcare providers. In the current study, our survey results reflected that 65% of the respondents stated that they experienced high cost of eye care services and more than 60% of the respondents admitted that they could not afford the services(15). Furthermore, people seem to be unaware of services they can access, where 62% of participants were uninformed of eye care services. Insurance and the availability of doctors also stop individuals from seeking medical help since 70% of the persons interviewed stated they had a surgical conjugutte phobia, and the constant fear of infections. This is in harmony with the other cross-sectional investigations that found out that most patients in LMICs experience barriers like financial problems to access the services because of perceived unnecessary, and fear of procedures(16). Furthermore, there is a question of trust in the manager or the healthcare provider and; most importantly, communication barriers relate closely to access. Despite the fact that majority of the participants (84%) claimed to have confidence in their eye care givers, some of them raised concerns of gender bias, poor behavor from the staff, and perceived quality of service. The most repetitive concern raised by half of the participants was concerning communication which is also an impediment to care delivery(17). These challenges coupled with the geographic and means of transport since many people are far from the health facilities. Research from the Africa and Asia contexts is also aligned with such concerns, where individuals, particularly women and those living in rural areas, are financially, culturally or physically unable to access available forms of eye care(14). Combating these barriers must involve a number of steps like increasing the awareness rates, decreasing the costs, increasing the number of transport available, and building patient physician rapport(18-20).

CONCLUSION

This study aimed to highlights the barriers in accessing eye care services among marginalized groups in UC Kili Shiekhan, tehsil Chiltan, Quetta. It is concluded from this research that there mostly people have cost and finance issues regarding eye care services, there is a communication gap among them and fear of surgery is also found as an obstacle in accessing eye care facilities. Most importantly distance from hospitals and relatively low knowledge and awareness about facilities and services regarding eye care are playing a great role as barriers to access eye care among them. Spectacles (eye glasses) as cosmetic issue and managing of spectacles are also found as barriers. On minor scale race and gender favoritism hindrance to access eye care services. There must be proper setup for counselling. It is also mandatory to conduct further research in this territory.

ACKNOWLEDGEMENT: None
CONFLICT OF INTEREST: None
GRANT SUPPORT AND FINANCIAL DISCLOSURE: None.

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Authors Contributions:

Shahsawar Ali and Ayesha Saeed: Substantial contributions to the conception and design of the work.

Mehboob Ali and Muhammad Amir: Design of the work and the acquisition. Drafting the work.

Zabid Ali: Final approval of the version to be published.

Submitted for publication: 01-05-2024
Accepted after revision: 30-06-2024

Original Article

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Effect of Dengue Fever on Liver Enzymes

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ABSTRACT

Background and Objectives: Dengue fever is a disease that is commonly found in endemic areas and is caused by the dengue virus which is spread by mosquitoes, specifically the Aedes aegypti mosquito. To determine the platelet count in dengue fever patients on the 5th day of diagnosis. To determine the correlation of dengue fever with liver enzyme.

METHODOLOGY: A retrospective study was conducted in the Bahria Hospital in Lahore, Pakistan. The study was conducted during the 3 months from May to July, 2023. The study included a total of 140 individuals with confirmed dengue fever, comprising 58 women and 82 men with ages ranging from 1 to 90. The study was conducted to determine the platelet count on the 5th day of diagnosis and to find out the correlation of dengue fever with liver enzymes. Patients were dived into 3 groups according to the age range 5-30, 31-60, and 61-90 years. Hematology results of these patients indicated low platelet count (<130×109/L). The instrument or machines we used for platelet count and liver enzyme measurement were Cell-DYN Ruby and Alinity ci-series respectively. A self-designed Performa was used to collect the patient data. Data were entered and analyzed by using excel and displayed by using Tables and Bar Charts.

RESULTS: According to the study, adults between the ages of 31 and 60 were most frequently affected by low platelet counts. Aspartate transaminase (AST), alanine transaminase (ALT), and alkaline phosphatase (ALP) levels were also found to be increased in individuals between the ages of 5 and 30 in 26%, 27%, and 8.5% of instances, respectively. The majority of patients with higher AST, ALT, and ALP values were between the ages of 31 and 60, with 53.5%, 52%, and 15.7% of patients displaying increased levels, respectively. In 14%, 14%, and 3.7% of patients between 61 and 90 years old, respectively, increased levels of AST, ALT, and ALP were found.

CONCLUSION: In conclusion, patients between the ages of 31 and 60 were found to have the highest prevalence of increased aminotransferases among all age categories, with AST and ALT levels being twice as high as ALP levels.

KEYWORDS: Aspartate transaminase (AST), Alanine transaminase (ALT), Alkaline phosphatase (ALP).

INTRODUCTION

Dengue fever is caused by positive single-stranded, mosquito-borne dengue virus. The virus belongs to a family of Flaviviridae having 1 of 4 serotypes (DEN1, DEN2, DEN3, and DEN4)(1). Recently 5th serotype of dengue virus (DEN-5) was identified in Malaysia from the blood of patients. On the basis of viral genome changes all these serotypes has further subtypes or genotypes and are categorized by the number of antigens that the virus have in common(2). Female mosquitoes of the Aedes species, particularly Aedes aegypti and Aedes albopictus, carry the dengue virus, which can cause a variety of illnesses ranging in severity from moderate to severe(3). Dengue virus is spherical shaped RNA enveloped virus with 11000 nucleotides and only 1 reading frame(4). The dengue virus's RNA is replicated by the NS1 protein, which also aids in the virus's defence by preventing complement activation. The wide geographical distribution of Aedes aegypti, a mosquito species, poses a significant threat to approximately 2.5 billion individuals, increasing their vulnerability to dengue infection. Each year, an alarming 50 million cases of dengue are reported, highlighting the severity of the issue. Aedes aegypti serves as the primary carrier for various

How to cite this: Sahar T, Abid A, Ullah R, Bibi A. Effect of Dengue Fever on Liver Enzymes. International Journal of Healthcare Profession. 2024; 1(2):52-56

Vol. 01, Issue 02, April-June, 2024

vector-borne diseases, including dengue, zika, and chikungunya. This emphasizes the crucial role of this mosquito species in transmitting these diseases(5).

The clinical manifestation of dengue fever varies from mild (fever, headache) to severe fever, arthralgias, myalgia, cephalea and gastrointestinal disorders. According to signs and symptoms dengue virus is classified into 3 forms dengue fever (DF), dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) (6). The mortality rate of dengue shock syndrome (DSS) is 1-5%(4). Lab diagnosis indicates low level of platelets and white blood cells. Platelets are anucleated, small sized discoid shaped cells that are derived from megakaryocytes. In terms of abundance, platelets rank as the second most numerous type of cellular components found in the circulating blood, typically ranging between 150 and 450 billion per liter(7). Thrombocytopenia or low platelet count is the important factor in dengue infection. Low platelet count is observed in mild dengue fever but it become lowest in case of severe dengue fever. In dengue fever, suppression of bone marrow or consumption of platelets at periphery cause the alternation of platelets number and their functions which leads to thrombocytopenia(8). Dengue virus also damage the liver by direct affecting on hepatocytes that cause hepatocellular injury(9).

The liver, positioned in the right upper abdomen beneath the rib cage, is the second largest organ in the human body. Liver has a wide range of functions like liver helps in supporting metabolism, immunity, and vitamin storage. It also acts as a storehouse of blood and synthesizes 50% of lymph in the body. It also maintains blood sugar level, helps in the production and excretion of bile(10). Liver is considered as a unique organ because of its dual blood supply from the portal vein (75%) and the hepatic artery (25%). About 2% of adult`s body weight is made up of liver(11). Any abnormality that affects or damage the liver is known as liver disorder. Liver function test are performed to indicate if any inflammation or damage in liver cells. Following are the parameters of liver function test (LFTs), alanine transaminase (ALT), alkaline phosphatase (ALP), gamma-glutamyl transferase (GGT), aspartate transaminase (AST), bilirubin, total protein, and albumin. In dengue patient the elevation of transaminase varies in different cases. Globally dengue cases have been reached up to 400 million per year. This is because of certain factors like climate changes, globalization, travel, trade, socioeconomics and viral evolution(12). About 100 billion cases are reported out of which 390 million people are infected every year in worldwide. Countries like Pakistan, Bangladesh, India and Sri Lanka are adversely affected by dengue viral infection(13).

Half of worldwide population is at risk due to dengue infection. In Pakistan, dengue cases are increasing due to limited resources and lack of public health awareness which is an alarming situation. The hotspot for many vector-borne diseases (e.g., dengue hemorrhagic fever) is Pakistan. All four serotypes of dengue virus (DENV1-DENV4) are circulating in Pakistan and outbreak occurs mostly during monsoon period(14).

METHODOLOGY

It was a retrospective study. Data was collected from the medical ward of Bahria Hospital Lahore, Punjab. Total 140 samples of dengue patient were collected. The patients who were diagnosed with dengue fever on the 5th day of the onset of disease.

A Performa were used to collect patient data of dengue patients. Aseptic phlebotomy procedures were used to obtain intravenous blood samples from dengue patients. The methods and instruments we used for analysis were; Cell-DYN Ruby and Alinity ci-series.

The cell-DYN is a hematology analyzer used in many laboratories. It works on the principle of electrical impedance (allow the passage of one cell at a time from electrode), flow cytometry (when laser beam hits the moving cells, scattering of light occurs and the detector then detect the number of cells) and absorption spectrophotometry (absorption of light is directly proportion to the concentration of a substance in the sample). The system also utilizes MAPSS (Multi-Angle Polarized Scatter Separation) technology.

The Alinity ci-series is a clinical chemistry analyzer used for diagnostic test in clinical laboratories. It works on the principle of immunoassay like enzyme immunoassay (EIA) and chemiluminescence immunoassay (CLIA) and spectrophotometry (Beer Lambert law). Beer Lambert law stated that the absorption of light is directly proportional to the concentration of substance in sample.

Data were entered and analyzed by using excel for statistical analysis. Tables and Bar charts were used to display the data.

RESULTS

The study was conducted at the medical ward of Bahria Hospital Lahore, Punjab. 140 diagnosed patients of dengue fever were selected during the study. Out of these 140 patients 82(59%) were males and 58 (41%) were females.

Table No.1 Gender Based Distribution of Dengue patients

Male	Female	Total
82 (58.57%)	58 (41.43%)	140

The age range of patients in our study was 5-90 years. Patients were divided into 3 groups according to the age. In 1st group patients belonged to the age range between 5-30 years having 39 (27.85%) patients out of which 21 were males and 18 were females. The 2nd group patients belonged to the age range between 31-60 years having 80 (57.1%) patients out of which 52 were males and 28 were females. The 3rd group patients belonged to the age range between 61-90 years having 21 (15%) patients out of which 10 were males and 11 were females. The maximum number of patients (57.1%) belonged to the age group of 31-60 years.

Table No.2 Age Distribution

Age range	(0-30yrs)	(31-60yrs)	(61--90yrs)
Patients	39 (27.86%)	80 (57.14%)	21 (15%)

The analysis of platelet count in the patients with dengue fever showed the abnormal results in all patients. The patients were divided into 3 groups. Group 1 include patients with age range between 5-30 years, hematology result showed 39 (27.9%) patients had abnormal platelet count (less than 1 lac). Group 2 include patients with age range between 31-60 years, hematology results indicated low platelets count in 80 (57.1%) patients. While group 3 include patients with age group 61-90, low platelet count was observed in 21 (15%) patients. While the results of the study indicated that low platelet count was most common in adults.

Table No.3 Abnormal Platelets Count in patients with dengue fever

	Age group		
No. of Patients	5-30yrs	31-60yrs	61-90yrs
Patients	39(27.86%)	80 (57.14%)	21(15%)

140 patients were examined with liver function test which indicates abnormal level of liver enzymes in most cases. Patients with age group 5-30 years were observed with high level of alanine transaminase (ALT) in 38 (27%) patients, aspartate transaminase (AST) in 37 (26%) patients and alkaline phosphatase (ALP) in 12 (8.5%) patients respectively.

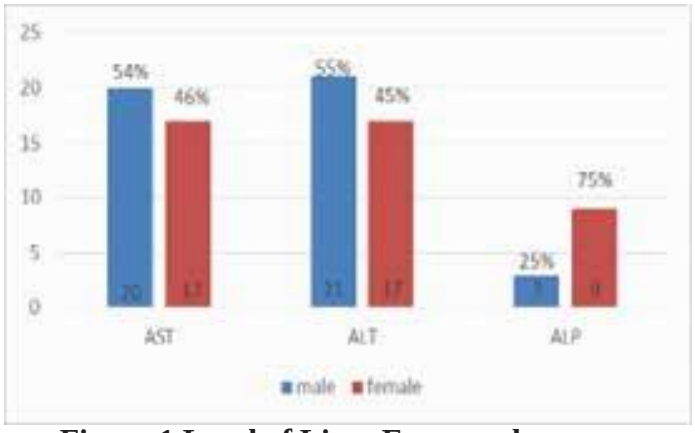


Figure 1 Level of Liver Enzymes between Age Group (5-30yrs)

Patients with age group 31-60 years had high level of alanine transaminase (ALT) in 73 (52%) patients, aspartate transaminase (AST) in 75 (53.5%) patients and alkaline phosphatase (ALP) in 22 (15.7%) patients respectively.

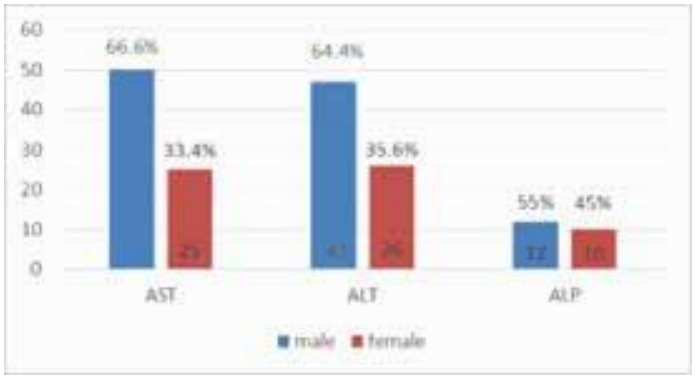


Figure 2 Level of Liver Enzymes between Age Group (31-60yrs)

Patients with age group 61-90 years had high level of alanine transaminase (ALT) in 20 (14%) patients, aspartate transaminase (AST) in 20 (14%) patients and alkaline phosphatase (ALP) in 5 (3.5%) patients respectively.

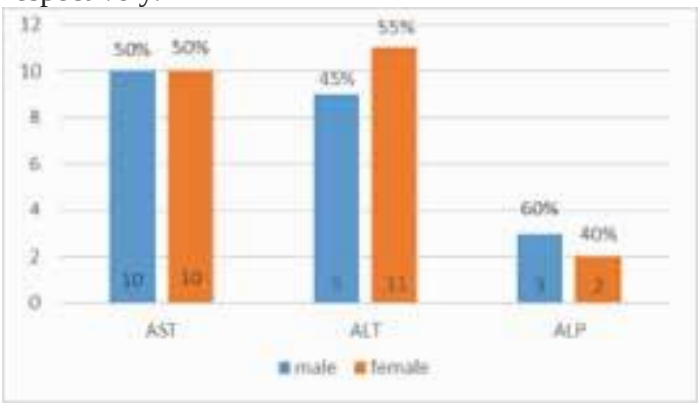


Figure 3 Level of Liver Enzymes between Age Group (61-90yrs)

DISCUSSION

Dengue fever, caused by a mosquito-borne viral infection, is the most notable illness of its kind. This tropical disease impacts a staggering number of individuals worldwide, affecting up to 100 million people. Dengue virus affects the reticuloendothelial system of the host directly that cause dysfunction of liver cells. Liver cells are affected directly by the virus or by dysregulated immune response of the host. Hence, liver function tests play a vital role in diagnosing dengue fever and assessing its severity, as they can indicate an increase in aminotransferase levels.

A study conducted by Kittitrakul and colleagues in Thailand, 127 adult dengue patients are recruited and liver function tests indicated raised level of transaminases in almost all patients at 7th day of infection. The abnormal level of aspartate transaminase (AST) and alanine transaminase (ALT) were found in 88.2% and 69.3% of patients. The ratio of abnormal transaminase (aspartate transaminase and alanine transaminase) was 1:8:1. Abnormal level of aspartate transaminase (AST) was found in febrile stage and it is associated with the bleeding. While abnormal level of alanine transaminase (ALT) is also found in febrile stage but it is associated with shock(15).

Another study conducted by Itha, Srivenu, et al, 45 diagnosed dengue patients were selected out of which 43 (96%) patients had elevated level of aspartate transaminase (AST) and alanine transaminase (ALT) but in severe disease aspartate transaminase (AST) and alanine transaminase (ALT) was increased up to 5-folds. While the raised transaminases were observed in adult patients. It was also observed in the study that 7 patients were died with dengue fever out of which 2 patients were suffered with acute liver failure(16). Similar results were observed in the study undertaken in 2023 at Hayatabad Medical Complex, Peshawar by Nazir Shah and colleagues. Severe increased in the level of alanine transaminase (ALT >300U/L) in dengue fever was associated with prolonged hospital stay and acute liver failure(17).

Saiful Safuan Md Sani, et al., studied the evaluation of creatinine kinase and liver enzymes in identification of severe dengue. The study showed that the data were collected from 365 patients, out of which 22 (6%) patients had severe dengue fever. Liver function tests and creatinine kinase of these patients were performed. The results indicated that the level of liver enzymes were elevated in dengue fever however the level of creatinine kinase did not differ by dengue fever(18).

TL. Nguyen et al., studied the impact of dengue hemorrhagic fever on liver function. The study shows the data were collected from 45 patients with confirmed dengue hemorrhagic fever. The level of serum transaminase was measured in these patients. The results showed abnormal level of aspartate transaminase and alanine transaminase in 97.7% and 37.3% of patients. While the level of aspartate transaminase is 5 times higher than the level of alanine transaminase in mild to moderate cases(19).

In 2018 by Mukker, Payal, and Smitha Kiran, studied 123 dengue cases. The result indicated low level of platelets (thrombocytopenia <1lakh) in 121 patients and more the 1 lakh in 2 patients. While lowest platelet count was observed in patients with low age range(20). Our results are comparable to these studies as it indicates adults between the ages of 31 and 60 were most frequently affected by low platelet counts. Aspartate transaminase (AST), alanine transaminase (ALT), and alkaline phosphatase (ALP) levels were also found to be increased in individuals between the ages of 5 and 30 in 26%, 27%, and 8.5% of instances, respectively. The majority of patients with higher AST, ALT, and ALP values were between the ages of 31 and 60, with 53.5%, 52%, and 15.7% of patients displaying increased levels, respectively. In 14%, 14%, and 3.7% of patients between 61 and 90 years old, respectively, increased levels of AST, ALT, and ALP were found.

CONCLUSION

It is concluded that dengue fever causes low platelet count and elevation in liver enzymes especially in aspartate transaminase (AST), alanine transaminase (ALT) and alkaline phosphatase (ALP). The elevation of aminotransferases and low platelet count is most common in adults. Dengue virus also affects the hepatic cells and lead to hepatocellular injury that cause elevation of liver enzymes.

Sources of Support:
No funding was received for this article.

Data Availability:
All raw and processed data is available.

Disclaimer:
The views expressed in this manuscript are those of the authors and not those of the institutions they are affiliated with.

ACKNOWLEDGEMENT: None
CONFLICT OF INTEREST: None
GRANT SUPPORT AND FINANCIAL DISCLOSURE: None.

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Authors Contributions:

Taha Sahar and Alishba Abid: Substantial contributions to the conception and design of the work.

Rehmat Ullah: Design of the work and the acquisition. Drafting the work.

Alia Bibi: Final approval of the version to be published.

Submitted for publication: 26-04-2024
Accepted after revision: 07-05-2024

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