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# IJHP

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### Editorial

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**From Hesitation to Action: The Power of Health Decision-Making****Sajid Hameed<sup>a</sup>**<sup>a</sup> Department of Public Health, Green International University, Lahore, Pakistan.Correspondence: [sajid.hameed@giu.edu.pk](mailto:sajid.hameed@giu.edu.pk)

“Decisions determine destiny”—this is especially relevant for healthcare. All health outcomes — from treating common illnesses to surviving life-threatening diseases — are the result of a chain of decisions. Whether individuals, families, and communities develop and maintain healthy, successful trajectories involves timely, informed, and deliberate decisions on the part of individuals, families, and communities. Whether it’s choosing when to go to a hospital, seek out professional help or follow medical advice, the ramifications of health-related decisions can be lifesaving — or life-threatening.

In an age of abundant and immediate information, deliberately deferring when to act on decisions related to health is an intellectual wobble. Several people delay care, misdiagnose, turn to incorrect information, or self-medicate. As seen in the research from the World Health Organization (WHO, 2023)<sup>1</sup>, the failure of decision-making concerning medical treatment adds a big component to the global burden of disease (World Health Organization, 2023).<sup>2</sup> Being unable to recognize when the time is right or the unwillingness to take action can lead a maintainable condition into a critical state.

Among the most relevant models is the “three-delay model,” initially designed to understand better maternal mortality and later generalized to explain the behavior of patients seeking for healthcare. This framework describes three essential delays: the delay in acknowledging the need for care, the delay in arriving at a health facility, and the delay in obtaining an adequate intervention (Thaddeus Sreen, 1994).<sup>3</sup> The initial delay—recognition is intrinsically linked to choice. If a person cannot tell when symptoms are serious, or if he or she is culturally or psychologically unwilling to act, timely intervention becomes impossible.

There are many factors influencing the effectiveness of decision making in health, such as health literacy, socio-economic status (eg, employment), cultural

norms, psychological preparedness and access to services. It must come as part of health literacy in particular. Another example is the likelihood of seeking care. If you have a good grasp of what symptoms, like, you know: chest pain, high fever, or persistent fatigue, etc. According to research, low health literacy has been linked to increased hospitalization rates, adverse health outcomes, and decreased use of preventive services.<sup>4</sup> Thus, enhancing health literacy at the population level is essential for public health.

Furthermore, decision-making does not occur in a vacuum. Societal demands, peers, and families usually have great influence. Many cultures, particularly collectivist ones, consult with elders or family members on health decisions. Although this might be helpful, it could also cause delays if classical cures or superstitions are given precedence above medical guidance. Hence required are culturally appropriate health promotion initiatives that honor customary views but underline the need of prompt health-care-seeking behavior.

The power to transform health decision-making lies in technology and digital health tools. Teleconsultation systems, mobile health apps, and artificial intelligence-powered symptom checkers let people evaluate their symptoms and make wise decisions. Research shows patients who turned to internet symptom checkers were more prone to seek adequate care and better interact with health care professionals.<sup>4</sup> Still, digital tools must be reliable, reachable, and easy to use to work well. Users can be misled by overdependence on unchecked internet knowledge, so reminding them about reputable sources becomes even more important through public awareness.

Another field in which the critical consequences of decision-making surfaced is mental health. Sufferers sometimes hide psychiatric symptoms because of stigma, fear of being judged, or ignorance, so much so. Prompt treatment is needed for suicidal thoughts, anxiety, and depression. Globally, more than 700,000

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people die by suicide every year, many of whom never received professional help, as the points out<sup>5</sup>. Preventing such disasters calls for promoting mental health awareness and encouraging help-seeking behavior.<sup>6</sup> Support for improved health decision-making also falls on policymakers and medical practitioners. From early on, public health initiatives, school-based education, and community outreach can all help to develop decision-making capabilities. Healthcare professionals need to establish settings where patients feel knowledgeable and respected. More research shows that shared decision-making—where physicians and patients cooperate to make healthcare choices—helps to enhance outcomes, compliance, and satisfaction.<sup>7</sup> In essence, decision-making is not just a cognitive behavior; it is a public health factor. The timing of help-seeking decisions, accuracy of those decisions, and confidence in them can all have a great impact on mortality and morbidity. Though personal actions are central, so too are institutional initiatives meant to increase access, reduce stigma, raise empowerment, and improve health literacy. Improving decision-making ability has to be elevated as a major approach to meet more patient-centered and preventive models of care toward better health outcomes.

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## Acceptance of Telemedicine in healthcare customers of District Karachi, Pakistan: a cross-sectional analysis

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### ABSTRACT

**Background and Objectives:** The global healthcare industry faced significant revenue and volume losses following the emergence of COVID-19 in December 2019. Telemedicine emerged as a potential solution to mitigate these challenges. The primary objectives were to determine the influence of internet browsing and immunosuppression on telemedicine acceptance and to evaluate the mediating role of fear of acquiring hospital-induced infections (HAI) in this relationship.

**METHODOLOGY:** A quantitative, cross-sectional study was conducted from April to September 2021. Data were collected using a validated online questionnaire distributed to patients, physicians, and health insurance providers in Karachi. The data were analyzed using SPSS version 24, employing correlation, regression, and mediation analysis. A p-value < 0.05 was considered statistically significant.

**RESULTS:** The study found that internet browsing significantly influenced telemedicine acceptance ( $p < 0.01$ ), while immunosuppression did not ( $p = 0.39$ ). The mediating role of fear of HAI was partially supported. The model's explanatory power was weak, with an R value of 0.29, indicating limited predictive capability.

**CONCLUSION:** The findings suggest limited acceptance of telemedicine among Karachi's population, highlighting the need for targeted awareness campaigns and policy adjustments. While internet browsing positively influenced telemedicine acceptance, immunosuppression did not. The study underscores the importance of addressing technological and health-related barriers to improve telemedicine adoption.

**KEYWORDS:** COVID-19, telemedicine, immunosuppression, internet browsing, healthcare acceptance.

### INTRODUCTION

The emergence of Covid-19 On December 1, 2019 cases resulted in a decrease in healthcare revenue and volume globally. Numerous systems have profited from the increased use of "telehealth," synonymous with "telemedicine." Telemedicine is the quick electronic communication of medical information between clinical practice locations for treatment and education [1]. The pandemic encouraged a shift from in-person consultations to telehealth services in Karachi, Pakistan, and other regions to reduce virus transmission risks. This shift has shown the potential of telemedicine to improve healthcare access but also raised questions about customer acceptance [2].

In addition, studies reveal that the perception of telemedicine has predominantly been favorable, with several patients reporting satisfaction with their telehealth experiences during the pandemic [3,4]. Factors affecting its acceptability encompass perceived advantages, usability, and the immediacy of healthcare need throughout the crisis [5]. Comprehending the dynamics of telemedicine adoption in Karachi is essential for guiding future healthcare policies and practices, especially as the healthcare environment evolves in the post-pandemic era [6]. The biggest problems in the health care system are creating telemedicine policies, licensing and accredit-

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ing doctors who practice telehealth, strengthening the information system, ensuring patients can access and understand technology, being at ease with it, and having a good relationship with their provider and the doctors that practice remote healthcare services struggle with time management, team building, professional health, and medical education [7]. The majority of studies examine social influence, effort expectancy, and enabling situations, with perceived usefulness (PU) and PEU mediating [8].

The study is grounded in the Technology. Internet browsing was chosen as a determinant due to its role in facilitating access to telemedicine services, while immunosuppression was selected to explore the impact of health vulnerabilities on telemedicine acceptance.

Thereby, this study aims to fill this gap by examining the impact of these variables on telemedicine acceptance among healthcare customers in Karachi, Pakistan. These findings can assist both public and private healthcare organizations in Pakistan in making informed decisions about the implementation of telemedicine projects. This, in turn, can inform health policymakers about the role of telemedicine as an initiative to enhance the country's healthcare sector.

The present study evaluates the dependent variable, acceptance of telemedicine, against the independent variables: internet browsing and immunosuppression. We also identified the impact of the mediating variable, fear of acquiring HAI, on the relationship between immunosuppression and acceptance of telemedicine.

## METHODOLOGY

This study employed a quantitative, cross-sectional design with a deductive approach. The target population included patients, physicians, and health insurance providers in Karachi, with a sample size of 384 respondents. The sample size was determined using a 95% confidence level and a 5% margin of error, based on the population of Karachi (16,459,000). Convenience sampling was used due to time constraints and accessibility.

Data were collected using an online questionnaire adapted from validated instruments, including the COVID-19 Fear Scale, the Prevalence of Immunosuppression Scale, and the Telemedicine Acceptance Scale. The questionnaire was distributed via Google Forms, and responses were recorded in Excel before being imported into SPSS for analysis. The data were analyzed using SPSS version 24. Descriptive statistics, correlation, regression, and mediation analysis were performed. Cronbach's alpha was used to assess the

reliability of the scales, with values above 0.7 considered acceptable. The mediation analysis was conducted using Hayes' PROCESS macro.

## RESULTS

Table 1 highlights the demographic characteristics of respondents. The sample consists of 384 respondents, with a nearly equal gender distribution (47.4% male, 52.6% female). The majority fall within the 21–35 age group (57%), followed by 36–50 years (21.9%) and 51–65 years (14.6%). Most respondents have a graduate degree (41.1%) and belong to the middle class (44.3%) or upper-middle class (43.2%). These demographic variables help contextualize the study's findings regarding telemedicine acceptance.

**Table 1: Demographic Characteristics of Respondents (N=384)**

Characteristic	Frequency	Percentage (%)
<b>Age Group</b>		
21–35 years	219	57.0
36–50 years	84	21.9
51–65 years	56	14.6
<b>Gender</b>		
Male	182	47.4
Female	201	52.6
<b>Education Level</b>		
Graduate Degree	158	41.1
College Degree	82	21.4
High School	59	15.4
<b>Socioeconomic Status</b>		
Middle Class	170	44.3
Upper Middle Class	165	43.2

Table 2 reveals the descriptive statistics of constructs in which the mean scores and standard deviations indicate moderate levels of Internet Browsing (Mean = 2.90, SD = 0.78), Immunosuppression (Mean = 2.03, SD = 1.14), and Telemedicine Acceptance (Mean = 2.81, SD = 0.79). Fear of Healthcare-Associated Infections (HAI) shows a relatively higher mean score (3.64, SD = 1.10), suggesting a notable concern among respondents. These values provide an overview of the distribution of key variables used in the regression and mediation analyses.

**Table 2: Model Summary (Regression Analysis)**

Variable	Mean ± SD	Range
Internet Browsing (IV1)	2.90 ± 0.78	1.00–4.70
Immunosuppression (IV2)	2.03 ± 1.14	1.00–5.00
Fear of HAI (Mediator)	3.64 ± 1.10	1.00–5.00
Telemedicine Acceptance (DV)	2.81 ± 0.79	0.86–5.00

Table 3 The regression model shows a weak relationship ( $R = 0.293$ ) and a low explanatory power ( $R^2 = 0.086$ , Adjusted  $R^2 = 0.081$ ). This suggests that only

8.6% of the variance in telemedicine acceptance is explained by Internet Browsing and Immunosuppression. The small  $R^2$  value indicates that other unmeasured factors may influence telemedicine acceptance, which is acknowledged as a limitation in the discussion.

**Table 3: Model Summary (Regression Analysis)**

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error
1	0.293	0.086	0.081	0.754

Table 4 indicates the ANOVA results confirm that the overall regression model is statistically significant ( $F = 17.740$ ,  $p < 0.001$ ), indicating that at least one of the predictor variables significantly contributes to explaining variations in Telemedicine Acceptance. However, despite statistical significance, the low  $R^2$  suggests the need for additional predictors to improve the model's explanatory power.

**Table 4: ANOVA Results**

Model	Sum of Squares	df	Mean Square	F	p-value
Regression	20.151	2	10.075	17.740	<0.001
Residual	215.246	379	0.568		
Total	235.397	381			

Table 5 shows Internet Browsing has a significant positive effect on Telemedicine Acceptance ( $B = 0.285$ ,  $p < 0.001$ ), suggesting that increased browsing is associated with higher acceptance. In contrast, Immunosuppression has a non-significant effect ( $B = -0.029$ ,  $p = 0.390$ ), implying that it does not significantly influence telemedicine acceptance. The confidence intervals confirm the significance of Internet Browsing while showing that Immunosuppression's effect crosses zero, reinforcing its non-significance.

**Table 5: Regression Coefficients with 95% Confidence Intervals**

Variable	B	Std. Error	$\beta$	t	p-value	95% CI (Lower–Upper)
Constant	2.045	0.173	–	11.849	<0.001	1.706–2.384
Internet Browsing (IV1)	0.285	0.050	0.284	5.726	<0.001	0.187–0.383
Immunosuppression (IV2)	-0.029	0.034	-0.043	-0.861	0.390	-0.096–0.038

V1: Internet Browsing; IV2: Immunosuppression; DV: Telemedicine Acceptance. Confidence intervals (CI) derived from 5,000 bootstrap samples. Bolded values indicate statistical significance ( $p < 0.05$ ).

Table 6 reveals the mediation analysis and it suggests that Immunosuppression does not significantly predict Fear of HAI ( $B = 0.060$ ,  $p = 0.224$ ). However, Fear of HAI significantly influences Telemedicine Acceptance ( $B = 0.116$ ,  $p = 0.001$ ). The indirect effect of Immunosuppression on Telemedicine Acceptance via Fear of

HAI is not significant ( $B = 0.007$ , 95% CI = -0.005 to 0.023), indicating that Fear of HAI does not mediate the relationship between Immunosuppression and Telemedicine Acceptance.

**Table 6: Mediation Analysis Results (Fear of HAI)**

Path	Effect	Boot SE	95% CI (Lower–Upper)	p-value
IV2 → Mediator (Fear of HAI)	0.060	0.050	-0.037–0.158	0.224
Mediator → DV (Telemedicine)	0.116	0.036	0.045–0.186	0.001
Indirect Effect	0.007	0.007	-0.005–0.023	–

Confidence intervals (CI) derived from 5,000 bootstrap samples

## DISCUSSION

The current study findings highlight the significant role of internet browsing in telemedicine acceptance, consistent with prior research on technology adoption frameworks such as the Technology Acceptance Model (TAM) and Social Cognitive Theory. These theories emphasize that familiarity with technology, as facilitated by frequent internet use, enhances perceived ease of use and usefulness, thereby driving acceptance [14, 15]. For instance, younger populations (e.g., Generation Y and Z), who are more tech-savvy, demonstrated higher telemedicine adoption rates, aligning with global trends where digital literacy correlates with telehealth utilization [16, 17].

Contrary to expectations, immunosuppression did not significantly influence telemedicine acceptance ( $p = 0.39$ ). This suggests that health vulnerabilities alone may not drive adoption, potentially due to cultural preferences for in-person consultations or distrust in remote diagnostics among immunocompromised patients [5]. However, the partial mediation effect of fear of hospital-acquired infections (HAI) indicates that while immunosuppression itself is not a direct predictor, the psychological fear of infection in clinical settings may indirectly encourage telemedicine use. This aligns with studies showing that perceived health risks during pandemics amplify reliance on telehealth [6, 7].

The present study is critically necessary at that time when COVID-19 lockdown restrictions began to relax, prompting healthcare regulators and professionals to seek a healthcare plan to mitigate the impact of future pandemics. This study found a low  $R$  value attributable to the negligible correlation between immunosuppression and the absence of a mediating effect of fear of getting HAI on the adoption of telemedicine [9]. This has facilitated opportunities for future researchers to include new variables to enhance the  $R$  value.

The acceptability of telemedicine among healthcare consumers in Karachi during the COVID-19 pandemic can be ascribed to various interconnected reasons. The

pandemic's urgency facilitated the swift development of telemedicine services. Research indicates that patients were predominantly content with telemedicine, highlighting advantages such as convenience, time efficiency, and less risk of infection [10, 11]. A recent survey has revealed that a substantial majority of participants deemed telemedicine beneficial during the epidemic with numerous individuals indicating a preference to persist with these services moving forward [2]. This corresponds with data from other regions, where patient satisfaction with telemedicine has been reported as high, especially when patients could connect successfully with their healthcare practitioners [12, 13].

Nonetheless, despite the favorable welcome, some challenges persist that may impede the long-term adoption of telemedicine in Karachi with inadequate technology infrastructure, insufficient training of healthcare personnel, and apprehensions about privacy and data security have been recognized as substantial obstacles [18]. A thorough assessment indicated that although telemedicine services were broadly accepted, their implementation encountered challenges associated with technical issues and regulatory frameworks [19]. The present study has tackled critical obstacles to facilitate the efficient integration of telemedicine into the healthcare system in Karachi and abroad.

Furthermore, the significance of healthcare practitioners in promoting telemedicine acceptability is paramount. Their thoughts and attitudes around telemedicine substantially affect patient acceptability. Research indicates that healthcare providers that are adequately trained and supportive of telemedicine are more inclined to promote its utilization among patients [20, 21]. Thereby, enhancing provider education and addressing their concerns regarding telemedicine can lead to improved patient outcomes and satisfaction.

#### Strength and Limitations of the study

The present study also bridges the gap that existed in prior researches from the perspective of the independent variables and mediating variables. Another advantage of this study is that it critically evaluates the customer's preferences and inclination towards telemedicine and telehealth in order to align independent organizational efforts in quality care delivery and growth of healthcare industry. The research is helpful for health legislative bodies in making policies for telemedicine and telehealth keeping in view the customer behavior and priorities. This study facilitates the Federal and Provincial Government of Pakistan to make discretion regarding allocation of budget for

restructuring telehealth in Pakistan.

The most prominent limitation of this study is it is quantitative study and it introduces biasness in responses since respondents have to choose any option from the fixed set of answers. In addition, it is a cross sectional research that studies a population at one point of time. The scope of this study is limited to Karachi City, only leaving behind a huge chunk on population of Pakistan and the other countries. The usage of simple random sampling technique has narrowed the scope of our study. The effect of predictors, outcome and mediator is checked but the effect of moderator is not studied in this research. Lastly, this research is conducted at the student level with in duration of four months only.

#### Future Considerations

First of all, it is imperative for the future studies to incorporate new independent variables to increase the R value of the research. Since, the role of mediation proved partial in this study, and future researchers could study the mediator as predictor to check its complete effect on acceptance of telemedicine, as well as introduce a moderator in the study. Further, this research could be done in countries where the scope of telemedicine is still emerging. Lastly, our worthy researchers may conduct this research as longitudinal design and could use systematic- random method of sampling.

### CONCLUSION

This study highlights that internet browsing significantly influences telemedicine acceptance, while immunosuppression does not. Fear of healthcare-associated infections (HAI) did not mediate this relationship, suggesting that telemedicine adoption is more technology-driven than health-risk motivated. Despite the model's statistical significance, its low explanatory power ( $R^2 = 0.086$ ) indicates that additional factors influence telemedicine acceptance.

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#### **Authors Contributions:**

**Abeer Ajaz:** Substantial contributions to the conception and design of the work.

**Sajjan Iqbal Memon:** Design of the work and the acquisition. Drafting the work.Final approval of the version to be published.

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**Knowledge, Attitudes, and practice of Nurses on Medication Errors in Saidu Group of Teaching Hospital Swat.***Majid Khan<sup>a</sup>, Najmus Saqib<sup>a</sup>, Muhammad Awais, Sadia Yahya<sup>a</sup>*<sup>a</sup> School of Nursing, The University of FaisalabadCorrespondence: [mjdhmd099@gmail.com](mailto:mjdhmd099@gmail.com)**ABSTRACT**

**Background and Objectives:** Enhancing human health is the primary objective of nurses. Among the most frequent, potentially dangerous mistakes that impact patient care are medication errors. These errors are seen as a worldwide issue that raises death rates, hospital stays, and associated expenses.

Aim is to study the medication errors of ordering, dispensing and administering and to compare the errors occurring in the Saidu group of teaching hospital with those occurring in the other health care setups around the world. To identify the most common mistake regarding the preparations of medication. To assess nurse's errors concerning administration of medication. To evaluate nurses' knowledge regarding Post administration of medication.

**METHODOLOGY:** At the Saidu group of teaching hospitals in Swat, a descriptive cross-sectional study was carried out. At Saidu Group of Teaching Hospital SWAT, 79 critical care nurses in total were chosen for the study and given an adopted questionnaire to complete. Questionnaire was consisted of four major parts, the demographic section, knowledge section, attitude section and practice. Data were entered into the SPSS version 26 software for analysis. And the results were represented in the form of frequency and percentages. For ethics stability, consent form is used and ethical approval was granted from college faculty and hospital committee.

**RESULTS:** The mean age in our study was 31 in which 68 % were male while 32% were female. 68% of the study participants (Nurses) label the medication cup and few nurses do not label the medication cup with patient's name or room number. Only 20% of participant did not report medication error.

**CONCLUSION:** Knowledge about medication process among nurses were good but further need a bit of improvement.

**KEYWORDS:** Medication error, knowledge, Nurse, attitude

**INTRODUCTION**

Any departure from the doctor's prescription order as it appears on the patient's chart is commonly referred to as a pharmaceutical mistake. Medication mistakes in hospitals happen roughly once every patient every day. Error rates for dosages administered during the cart-filling process range from 0.87% to 2.9%. A dispensing error occurs when pharmacy employees provide medications to nursing units or directly to patients in an ambulatory care pharmacy.(4). In 1983, 2876 people died from ME. By 1993, this number had risen to 7391, a 2.57-fold increase(16). Globally medication errors are among the major health and economic concerns. Annually 44,000 people die from preventable medication errors.1 One in every hundred Medi-

cation errors lead to adverse reaction that can result in death (11). Approximately 20% of all medication administrations result in error(17). Between one and two errors per patient each day go undetected in addition to those that are reported (5). Increased lengths of stay, readmissions, patient mortality, post-discharge impairment, and emotional anguish for the patient, family, and administering nurse are among the monetary and personal expenses linked to these mistakes(6). Errors can be found in five distinct stages of the MA process: prescription, typing, dispensing, administering, and patient condition/documentation monitoring(5). The administration stage is especially prone to mistakes (11). Errors are more likely to occur

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throughout these intricate procedures when requests or disruptions occur simultaneously (5). MA takes up between 16 and 40 percent of nurses' time (18). Since MA does not happen in a vacuum, it was determined that it actually "constitute[s] the day" because it was impossible to distinguish its effects from other duties, rather than taking up a specific amount of the nurses' day. Nurses' capacity to provide safe and efficient patient-centered care is impacted by how process interruptions are handled given the strong emphasis on MA (8).

#### Significance of the Study:

The medication error is one of the most common mistakes occur in health care system and nurses with pharmacist and physician have in important role in stopping these errors so our aim is to highlight these errors and give suggestion to overcome these errors.

#### Rational:

Patient admitted at health care setup have a chance of having victim of medication error so through this study we want to identify the statistics of these error and give suggestion about lowering the frequency of these error.

#### Operational definitions

**Registered Nurse:** A nurse is a person who is formally trained in a nursing institute and possesses a valid registration with Pakistan Nursing council.

**Knowledge:** Knowledge is understanding or awareness of nursing staff regarding the protocols of Medication administration.

**Attitude:** A settled way of thinking or feeling of nursing staff regarding Basic Life Support.

**Practice:** The actual application of Basic Life Support guidelines on patients by the nursing staff.

## METHODOLOGY

#### Type of Research

This is quantitative research, descriptive in nature. The data for this study was collected through a closed pre-coded questionnaire. Questionnaire included with closed ended questions. Quantitative examination is a method to test objective hypotheses and the relationship among variables (9). In our questionnaire there are four parts including demographic, educational level, practice and attitude of nurses toward the medication error.

#### Research Strategy:

A cross-sectional study was designed in public sectors of Swat to analyze the frequency of medication error and attitude of nurses toward the medication error. The study was conducted in public hospitals, (Public Hospital) Saidu group of Teaching Hospital, from March 20 to April 20 2022. The study was conducted through

pre coded, structured questionnaire. Questions were related to educational level and attitude of nurses toward the medication error. The questionnaire was given to the nurses of inclusion criteria randomly.

#### Research design:

A descriptive cross-sectional study was conducted in public hospitals of Swat. For data collection a structured questionnaire with consent form was attached, in which aim of the study and rights of participants and rules clearly mentioned. Questionnaire included with demographic knowledge practice and attitude section. Pilot study was done by 20 questionnaires to remove any type of error.

#### Pilot study:

Pilot study was done in Saidu Hospital Swat (SGTH). 20 Nurses were asked to fill the questionnaires. All Nurses had experience more than year in Nursing. 26 of our questions only few were found incorrect which is been remove from questionnaire.

#### Target Population

More than 420 nurses working in Saidu hospitals of Swat, which was a target population for this study

#### Sample Size

79 sample size was selected for the study, Nurses from Saidu government hospitals, Male and female with various designation from hospital was the part of it. we use RAOSOFT for finding our accurate sample size in which we take 10% error the reason we did not take 5% is we are the beginners so chances of error are there then we take 95% confidence level because its mostly used and our total population is 430 nurses in SGTH. So, the RAOSAFT give us sample size of 79 as a reference we attached the screen shot at the end of the study

#### Sampling Technique

Due to shortage of time and lack of resources we apply Non probability descriptive cross sectional sampling technique.

#### Data Collection Methods

Data was collected through a questionnaire which include close ended questions. And questionnaire was the instrument of the study every participant has asked in consent form that if they want to leave the study at any time, they are free to leave. Questionnaire is the best and suitable data collection method for quantitative study as proved by many articles.

#### Research Instrument

Well structured, close ended questionnaire was my research instrument. The questionnaire covered four parts:

- ☒ Demographic data
- ☒ Educational level
- ☒ Practice of nurses



## ☒ Attitude of nurses toward medication process

### Research survey:

When we modify our questionnaire and remove the incorrect questions from it then we visited to the Saidu group teaching hospital and discussion with the staff about the research and explain the questioned to them which they find difficult. Some staff just simply reject to give us data while some said that leave the questionnaire and come after an hour and take it and some filled it on the spot.

### Inclusion Criteria:

All those registered nurses in SGHT having a least one-year experience and performing duty in different wards and willing to share experiences with us are come in our inclusion criteria. (n=50).

### Exclusion Criteria:

Nurses who are not present in hospital during our study or those who are not willing to share their experiences with us are come in this part of our study.

### Sampling:

The sample was drawn by non-probability convenient sampling techniques from the nurses available at the hospital at the moment.

### Research Instrument:

For conducting the survey, we used questionnaire as an instrument. A close ended questionnaire was used with a nominal question. The language of the questionnaire is English. The questionnaire consists of five portions, the consent form, the demographic questions and the educational level the practice and attitude of nurses toward medication error.

### The demographic part:

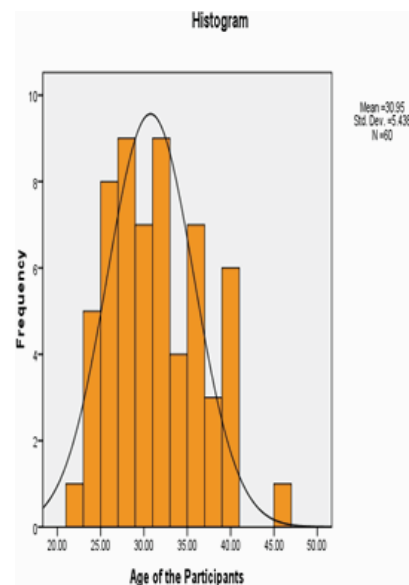
In this part of the questionnaire, we have asked the participants about age, gender, qualification. We also asked the nurses about their position and the options which we gave were diploma, specialization, BSN and MSN. Number of years in Nursing has been asked.

### Data Analysis:

Data analysis was performed using SPSS, version 26, software. Frequency distribution tables for categorized variables, and numerical indices of minimum, maximum, mean and standard deviation (SD) for research quantitative variables were provided by means of descriptive statistics, and tables related to comparisons and correlations were done using analytical statistics.

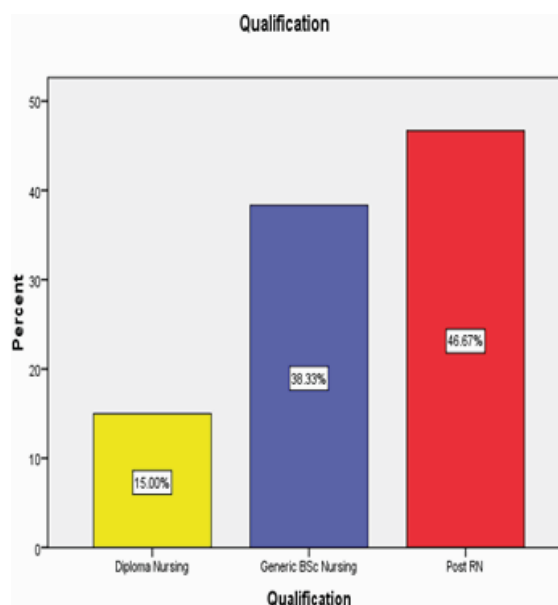
## RESULTS

Interpretation: The graph reveal mean age of the study participants (Nurses) is 31. And the standard deviation is 5.4.



**4.1 Graph no 1: Mean age and standard deviation of the study participants**

In our study most of the study participants were male (68%) and less were female nurses (32%).



**Graph no 2: Gender**

### Interpretation:

The education of nurses who were selected for the study was Diploma Nurses (15%), generic BScN (38%) and Post RN (47%).

**Table No 1: ignorance of medicines minor side effect by the nurses**

Do you check patient's armband prior to administer medication					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	47	78.3	78.3	78.3
	No	13	21.7	21.7	100.0
	Total	60	100.0	100.0	

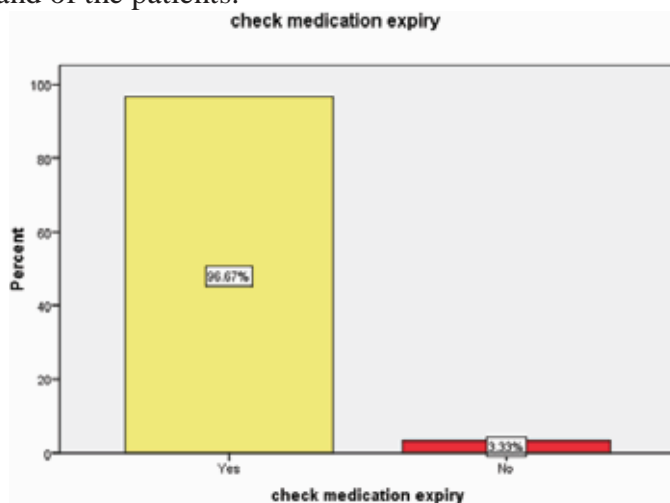
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	12	20.0	20.0	20.0
	No	48	80.0	80.0	100.0
	Total	60	100.0	100.0	

Interpretation: The mean experience of the nurses who were selected for the study was 8 year and standard deviation was 5.5%. The major reason for not participation and incomplete participation were family restrictions, time constraints and unexpected distance (attending) phone calls, physician calls for consultation and crying of children). Total 384 nursing mothers participated in study. Each district contributed around 33% participants. The socio-demographic variables of the study were district of residence, age and education of nursing mothers, number of children and place of delivery of last child. that among total participants, 72% (n=277) nursing

**Table No 2: Nurses checking patient armband prior to administer medication**

Do you prepare and carry medication of more than two patient at a time					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	29	48.3	48.3	48.3
	No	31	51.7	51.7	100.0
	Total	60	100.0	100.0	

Majority(78%) of the nurses check the patient armband before administering the medication to reduce the chances of error and very few ignore to check the armband of the patients.



**Graph no 7: Nurses check medication expiry when administering medicines**

Interpretation: Approximately all the study participant's nurses check the expiry of the medicines before administering the medication to the patients

**Table No 2: Nurses checking patient armband prior to administer medication**

Do you label syringes and bags with medication, name, and room number					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	43	71.7	71.7	71.7
	No	17	28.3	28.3	100.0
	Total	60	100.0	100.0	

Interpretation:

Maximum number (72%) of the study participant's label syringes and bags with medication, name and room number of the patients

## DISCUSSION

This study was conducted with aim of identifying potential medication errors with their prevalence in Saidu group of teaching hospital, in resource limited setting. The role of nurse in preventing medication errors was also investigated. It was found that medication errors were common in health care setup.

In our study the nurses that much open to answered the that what type of medication error they done and what were the conserveness after the incidence but most of the nurses 93.3% said that its necessary to report any error in the medication process. Through discussion with staff, we find out that most of the error occur in the administrative phase of medication process as same to the study saying that Approximately 78% (158) of the 202 surveys received included medication error in administration. (22). During the study period, 136 (68 %) medication errors were encountered in medication orders (n=200) by clinical pharmacists. Male gender was found most susceptible to medication errors (70.59%). Among the identified errors, prevalent error found was dosing error (27.21%), followed by incomplete prescription error (13).

Majority 68.33% of the participants in our study were male while only up to 32% were female which is also one of the reasons of low number of medication error as the study say that the response rate to the survey was 8.2%. Approximately 78% (158) of the 202 surveys received included medication error descriptions; we analyzed these 158 accounts. Of those nurses who admitted making an error, 87% were women(22).

The work load in government hospital is too huge because the number of nurses is too few in Saidu hospital. In our study 67% replied that there is enough staff

and the rest replied that there is no enough staff to handle work load which result poor patients care. Educational level section of our questionnaire has seven questions and the response to these questioned were 100% positive everyone knows the basics and have knowledge about medication error. Explanation of side effect from any medicines to the patients is important because it keep important role in patient's care. In our study 71.6% nurses replied that they explain the medication side prior to administering the medicine to the patients.

One of the main reasons of control medication error rate Is also that majority 73.3% nurses did not administer the medicine prepare by another nurse. And 97% of the participant have check the expiry rate before administering medicine.

### CONCLUSION

Results of the study confirm that frequency of medication error among nurses is not too much high but still it is significant and should be taken as a part of concern. The reason of low frequency of medication error is the educational level of nurses which was quite good and other reasons were the attitude of nurses toward medication process they check expiry before administration and explain the process to their patient. But still need to give more education on how to lower the frequency of error and what to do if any error occurs because some nurses answered that they did not report if medication error occur.

Recommendation:

This study result showed that the ratio of medication error among nurses selected from Saidu government teaching hospital Swat KPK is low. The main reason behind this is the work experience which was more than 8 year and the strong reason was educational level. 38% were BScN and 46% of nurses done their post RN only few were only diploma nurse which was the reasons of low medication error frequency. In one study the researcher said that 87% of error occur from female nurses and our study 68% were male but still need to overcome this problem and completely remove the medication error for which the government need to arrange session in which the more experience nurses need to take the class and share their experience.

Limitation

Due to insufficient time and lack of resources our research study is limited to Saidu government teaching hospital Swat KPK and to a sample size of 79 staff nurses. And convenient sampling method is applied because of insufficient time.

One of the main reasons of control medication error

rate Is also that majority 73.3% nurses did not administer the medicine prepare by another nurse. And 97% of the participant have check the expiry rate before administering medicine.

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**CONFLICT OF INTEREST:** None

**GRANT SUPPORT AND FINANCIAL DISCLOSURE:** None.

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#### **Authors Contributions:**

**Majid khan:** Substantial contribution to the conception, design of the work.

**Najmus Saqib, Muhammad Awais:** Survey and design of the work. Data collection. SPSS computing tool.

**Sadia Yahya:** Drafting for approval of the final version to be published.

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## Effects of Nurse-led based educational interventional on knowledge and practice for professional communication skill between inter and intra department among internee students

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### ABSTRACT

**Background and Objectives:** Effective communication is crucial in healthcare, yet intern students often struggle with communication skills, leading to errors and adverse events. To Assess the impact of nurse-led educational interventions on knowledge and practice of communication skills among intern students.

**METHODOLOGY:** A mixed-methods design was used, with a pre-post quasi-experimental study and focus groups. Intern students (n=30) received nurse-led educational interventions, including workshops and simulations, focusing on communication skills. Knowledge and practice were assessed using a questionnaire and observed simulations.

**RESULTS:** The mean difference of -8.500 shows that post-knowledge scores are, on average, 8.5 points higher than pre-knowledge scores. The confidence interval (-10.031 to -6.969) confirms that this difference is statistically significant and not due to random variation. The t-value of -11.355 and the degrees of freedom (29) further support the statistical significance of the results. The p-value of 0.000 indicates a highly significant difference between pre-knowledge and post-knowledge scores.

**CONCLUSION:** Key findings from the research suggest that intern nursing students who participated in the nurse led educational program demonstrated marked improvements in their ability to communicate effectively, resolve conflicts, and collaborate with peers and senior staff. This has positive implications for patient care, as effective communication is critical to ensuring safe and coordinated treatment

**KEYWORDS:** nurse-led base educational information, inter department, inter professional communication, knowledge attitude and practice, intern student, standard deviation, statistical package for the social sciences.

### INTRODUCTION

The introduction lays out the importance of effective communication in nursing practice, emphasizing its role in building therapeutic relationships, minimizing errors, and improving patient satisfaction and outcomes. It highlights the need for nursing students to develop strong communication skills to navigate complex clinical environments and address diverse patient needs. The challenges and hesitancies in communication among healthcare professionals, especially in voicing concerns or handling difficult conversations, are also acknowledged.<sup>1</sup>

The introduction suggests that while communication skills are crucial, nursing students often lack adequate training in this area. It mentions the significance of

educational interventions to enhance communication skills among intern students, both within and between departments. The article aims to explore a study focusing on the impact of nurse-led educational interventions, including simulations, on improving the communication abilities of intern students.<sup>2</sup>

Overall, the introduction sets the stage for the importance of the study in addressing the communication needs of nursing students and its potential implications for patient care and safety. The literature review provides insights into various studies related to communication skills training among healthcare professionals, particularly focusing on nursing students.<sup>3</sup> The literature review encompasses several studies

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focusing on various aspects of nursing, including clinical experience, educational qualifications, communication skills, and safety culture within healthcare settings.<sup>4</sup>

Kim and Sim (2020) conducted a study involving nurses, primarily aged 25-29, with a majority being university graduates. The sample predominantly comprised general nurses with varying levels of clinical experience, primarily working in secondary hospitals.<sup>5</sup>

Gutierrez-Puertas, Marquez-Hernandez et al. (2020) conducted a systematic review involving studies with a total sample size of 1,295 participants. These studies, mostly conducted in the last decade, covered areas such as mental health, end-of-life care, and maternity.<sup>6</sup> The majority of studies utilized quasi-experimental designs, focusing on pre-test and post-test measurements.<sup>7</sup>

Donovan et al. (2019) aimed to evaluate nursing students' communication skills through practical application in simulated scenarios. The study included undergraduate nursing students, with

Descriptive characteristics indicating a majority of female students, primarily with high school or higher education qualifications.<sup>8</sup>

Blake et al. (2019) investigated the impact of simulation on nursing students' therapeutic communication skills. Following the simulation, students reported improvements in their ability to communicate therapeutically, with both patients and peers participating in debriefing sessions to discuss strengths and weaknesses.<sup>9</sup>

Okuyama, Suzukamo et al. (2023) surveyed healthcare staff to assess safety culture, revealing predominance among women with less than six years of experience. The study highlighted areas for improvement, particularly in "no punitive response to errors," with better safety culture observed among more experienced staff and those with lower educational levels.<sup>10</sup>

Overall, these studies provide insights into various aspects of nursing, from clinical practice to education and safety culture, highlighting areas for further research and improvement in nursing practice.<sup>11-13</sup>

## OBJECTIVE

To assess the effects of nurse-led base educational interventional of knowledge and practice for professional communication skill between inter and intra department among internee students.

## METHODOLOGY

The research design utilized in this study is a quasi-ex-

perimental approach to investigate the impact of an intervention on the development of communication skills among nurses. Purposive sampling was employed to select participants from a population of 30 student nurses working in a hospital setting.

The study was conducted between February 2024 and June 2024, following approval from the Institutional Review Committee of the Faculty of Nursing at Ali Fatima Hospital. The sample size was determined using the formula  $n = N / (1 + N(e^2))$ , with  $n$  representing the sample size,  $N$  representing the population size, and  $e$  representing the margin of error (5%).

Inclusion criteria for participant selection included internee students and those identified as lacking in communication skills. Conversely, exclusion criteria comprised students who displayed a lack

of interest in participating and those who were proficient in communication with patients and staff nurses. In conclusion, The study employed a quasi-experimental design to assess the impact of an intervention on enhancing communication skills among nurses. Purposive sampling was used to select 30 student nurses from a hospital setting.

## RESULTS

Frequency: The number of respondents in the 18-24 years age group is 30. Percent: This represents the percentage of the total respondents, which is 100% in this case since all respondents fall within this age group. Valid Percent: This is also 100%, as all the data is valid and falls within this single age category. Cumulative Percent: This indicates that 100% of the cumulative total falls within the 18-24 years category. The sample consists entirely of females, with no other genders represented. Every individual (30 out of 30) in the sample is female, resulting in 100% for all percentage-based columns. There are no missing or invalid responses, ensuring that the valid percent matches the overall percent. The sample consists of individuals from four different departments. The Medical Surgical department has the highest representation with 33.3%. Pediatrics follows with 30.0%, Gynae with 20.0%, and Psychiatry with 16.7%. The cumulative percent column shows the progressive accumulation of percentages, reaching 100.0% at the final category. The last column shows the count of individuals with each qualification. In this case, there are 30 individuals with a Bachelor's degree.

**Table# 1:**

		f	%
AGE	18_24YEARS	30	100.0
GENDER	FEMALE	30	100.0
DEPARTMENT	MEDICAL	10	33.3
	SURGICAL		
	PEDIATRICS	9	30.0
	GYNAE	6	20.0
	PSYCIATRY	5	16.7
QUALIFICATION	BACHELOR	30	100.0
CLINICAL	LESS THAN	27	90.0
EXPERIENCE	1 YEAR		
	3 YEARS	3	10.0

mean difference of -8.500 shows that post-knowledge scores are, on average, 8.5 points higher than pre-knowledge scores.

The confidence interval (-10.031 to -6.969) confirms that this difference is statistically significant and not due to random variation.

The t-value of -11.355 and the degrees of freedom (29) further support the statistical significance of the results.

The p-value of 0.000 indicates a highly significant difference between pre-knowledge and post knowledge scores.

#### Paired Samples Statistics

	Mean	N	Std. Deviation	Value of p
Pair 1				
PREKNOWLEDGE	57.77	30	8.249	
POSTKNOWLEDGE	66.27	30	5.614	<.001

#### DISCUSSION

The study evaluated the impact of a nurse-led educational program aimed at improving communication skills among internee students, focusing on interactions within and between departments. Results showed a significant improvement in communication skills post intervention, with substantial increases in knowledge and skill levels. The study had a response rate of 72.5%, with participants predominantly female and aged between 19 and 33 years. Another study referenced highlighted issues in safety culture among hospital staff, with better results observed among more experienced staff and those with lower educational levels.

The significant difference in pre- and post-knowledge scores, along with large effect sizes, emphasized the effectiveness of the educational program. It was suggested that such structured interventions could enhance communication skills crucial for patient care

and interprofessional collaboration, leading to better coordination, reduced errors, and improved efficiency.<sup>14</sup>

The implications for nursing education and practice are noteworthy, emphasizing the importance of integrating nurse-led educational programs into curricula to improve communication skills. This approach can contribute to better patient outcomes, smoother workflow, and cohesive teamwork among healthcare professionals. Furthermore, the success of the program highlights the potential for nurse-led initiatives to drive educational improvements in various professional development areas.<sup>15-19</sup>

In summary, the nurse-led educational program had a significant and positive effect on communication skills among internee students, supporting its incorporation into nursing education to enhance collaboration and patient care. Further research is needed to explore the broader applications of nurse-led educational initiatives in healthcare.<sup>20</sup>

#### CONCLUSION

The research on a nurse-led educational program targeting communication skills in intern nursing students reveals promising outcomes. Participants showed significant improvements in communication, conflict resolution, and collaboration, suggesting positive impacts on patient care.

However, limitations like small sample size and subjective assessments underscore the need for further robust studies. Despite challenges, the program proves effective, recommending continued investment to foster communication excellence in healthcare teams, thereby enhancing patient outcomes and workplace efficiency.

#### RECOMMENDATION

- Nurse-led education can foster better collaboration and communication among intern students from different departments, promoting a teamwork approach to patient care.

- Effective communication is critical in healthcare settings. Nurse-led education can improve communication skills, reducing errors and improving patient safety.

- Intern students who participate in nurse-led education may feel more confident in their communication abilities, leading to better interactions with patients, families, and healthcare.

#### LIMITATIONS

- The number of intern students available for participation might be small, reducing the statistical power and the ability to generalize findings.

- Ensuring informed consent and maintaining confidentiality can be challenging, particularly in a learning environment.
- Obtaining ethical approval for the study may be complex and time-consuming, delaying the research process.

#### CONFLICT OF INTEREST

. No conflict of interest

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## Impact of the COVID-19 Pandemic on Contact Lens Usage Patterns in Pakistan

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## ABSTRACT

**Background and Objectives:** The COVID-19 pandemic has affected the daily life routine with a reduction in social activities due to lockdown. It has affected the use of contact lenses. The study aimed at evaluating the pattern of contact lens wear and possible explanations for contact lens discontinuation during pandemic in our population.

**METHODOLOGY:** After taking written informed consent a self-designed printed/online questionnaire was given to study participants. Data was entered and analyzed by SPSS version V.25 software. Frequencies and percentages are given for categorical variables. The continuous data is summarized in the form of mean  $\pm$  standard deviation or median (IQR) depending upon the distribution. The distribution of data was assessed by Shapiro-Wilk's statistics. To establish relationship between categorical variables Pearson's Chi-square test was applied.

**RESULTS:** Our study concludes that the individuals had increased the hygiene and replacement schedules for lenses. Almost half of the study subject discontinued contact lens wear during COVID-19 pandemic. The most frequent cause of discontinuation of contact lens wear was social isolation.

**CONCLUSION:** There is recommendation for contact lens wearers to maintain their contact lens case replacement and cleaning habit. If the wearer is feeling sick because of coronavirus, then they should temporary discontinued their lenses and after recovery resume wearing their lenses but the new ones.

**KEYWORDS:** Contact lens, COVID-19 impact, Discontinuation, Pattern of CL wear, Contact lens hygiene. CL care, behavior toward CL wear and care.

## INTRODUCTION

Contact lenses are the corrective lenses directly placed on the surface of the cornea<sup>1</sup>. Contact lenses are used to treat refractive error, keratoconus, anisometropia, unilateral aphakia, and also used for therapeutic purposes. Quality of life gets improved by using contact lenses because it's not only corrected refractive errors, it also provides a better appearance.

## 1.1. Types: -

There are different types of contact lenses

- Soft bandage contact lenses

For therapeutic use

- Hard contact lens
- Soft contact lens
- RGP contact lens
- Hybrid contact lens
- Scleral contact lens

- Multifocal contact lens
- Painted contact lenses

In aniridia, coloboma for cosmetic purpose

Types based on wearing time

- ☒ Daily wear
- ☒ Extended wear
- ☒ Disposable

The prevalence of myopia is increasing day by day. It has been reported that 28 % of the global population was affected by 2010 and nearly 50 % of the global population will be affected by 2050. High myopia is associated with many sight threatening problems and causes permanent visual defects. Although some multifocal and extended depth of focus soft lenses were found effective in slowing down the progression of

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myopia.<sup>3</sup> Eye care practitioners or optometrists agree on the importance of myopia management by contact lenses for rapid development or higher myopia in children's. Majority of eye care practitioner in Australia and New Zealand have strong interest in the management of myopia by CL, they think it is the right option and it should be given to everyone. Similarly, it is the common practice in these countries to introduce myopia managing CL in children under 15 year of age. The proportion of ECP's using CL for management of myopia in children more than 10 years of age is much higher (78%) as compared to the ECP's (50%) treating children in less than 8 years of age. Approximately 6 out of 10 eye care practitioners recommend increasing outdoor activities and reduce screen time for pediatric myopes.<sup>4,5</sup>

#### COVID-19 Pandemic

The period of COVID-19 Pandemic is considered as March-August 2020.

#### Contact lens discontinuation

A subject will be considered as having discontinued using the contact lenses if he/she stopped using contact lenses for a week or few days in a week (Pucker & Tichenor, 2020).

The discontinuation will be as

- Temporary

Discontinued the contact lenses temporarily but again continued wearing contact lens during March-August 2020

- Permanent

Never used contact lenses during March-August 2020.

#### Rationale

Limited data is available describing the pattern of contact lens use changes in COVID-19 pandemic period. Also, the available data show variable results regarding reasons for discontinuation or continuation of CL use during COVID-19. The present study is designed to bridge this gap by investigating the pattern of contact lens wear as well as exploring the reasons for the discontinuation of use if any during the pandemic.

#### Objectives

- To determine the pattern of contact lens use during COVID -19 pandemic.
- To determine the frequency of patients discontinuing the contact lens wear during the COVID -19 pandemic.
- To determine the causes of stopping contact lens use during COVID -19 pandemic.

## METHODOLOGY

### 1. Study design

This is descriptive study.

### 2. Place of study

At Nain Sukh Eye Hospital Saddar, Rawalpindi.

### 3. Study duration

2 months (1/5/2021 – 30/6/2021)

### 4. Sampling technique

A Convenient sampling technique has been used.

### 5. Sample size

The following formula (Daniel, 1999) was used for sample size calculation

$$n = \frac{Z^2 P (1 - P)}{d^2}$$

Where n = sample size,

- Z = Z statistic for a level of confidence, value is 1.96
- P = Expected prevalence or proportion, value is 31.5% (Irfan, et al., 2019).
- d = Precision, value is 0.10

According to this formula, the sample size should be 86.

### 6. Inclusion criteria

- All contact lens users who are presenting in the eye OPD will be included in this study.

### 7. Exclusion criteria

- Patients who discontinued their lenses because of any systemic disease or due to ocular pathology i.e. eye trauma or eye infection etc.

### 8. Data collection procedure

After taking written informed consent a self-designed printed questionnaire was given to walk-in participants and the online version of the self-designed questionnaire was sent to the participants whose data was taken from the register of Nain Sukh eye hospital who visited or attended eye OPD during March to August 2020.

The questionnaire has 4 sections in the Performa used to collect the data i.e. Section 1 representing demographic data of participants (such as name, age, gender, and occupation), and CL history (the type of lenses, wearing time, the purpose of CL wear, and from where they purchased their lenses). Section 2 representing the change in the personal behavior or attitude toward CL wear during COVID-19 if they didn't discontinue their lenses. Section 3 representing the question in which contact lens users tell about how they change the pattern of CL wear and care. Section 4 representing the questions in which contact lens users tell us about possible reasons of contact lens discontinuation.

## 9. Data analysis

Data was entered and analyzed by SPSS software 25. Frequencies and percentages was given for categorical variables. The continuous data was summarized in the form of mean  $\pm$  standard deviation or median (IQR) depending upon the distribution. The distribution of data will be assessed by Shapiro-Wilk's statistics. The Pearson's chi-square test was be applied compare the categorical variables.

## RESULTS

Our sample comprised of hundred and twenty individuals who were using contact lenses. The incomplete questionnaires were excluded from the results. A total of 99 completed forms were finally used for data analysis. Around two thirds of study subjects were females (n=71, 71.72%) and one third were males (n=28, 28.28%).

The mean age of all study subjects was  $25.98 \pm 5.78$  years. The mean age of females was  $26.65 \pm 6.39$  years and that of males was  $24.29 \pm 3.33$  years.

The results revealed that most of the individuals relied on optical shops for buying contact lenses irrespective of the COVID-19 pandemic. However, there was a significant rise from (6.1%) to (22.2%) in the utilization of online purchasing facilities during the COVID-19 pandemic (p-value = 0.005). In pre COVID era 42 (42.4%) individuals were wearing their lenses for 4-7 hours. The contact lens wearing time did not adequately change due to the COVID-19 pandemic situation (Table 1).

Variables		Frequency		p-value
		During COVID-19 pandemic	Pre-COVID Era	
Contact lens case Replacement duration	1 month	24 (24.2%)	22 (22.2%)	0.973
	3 monthly	18 (18.2%)	18 (18.2%)	
	6 monthly	14 (14.1%)	13 (13.1%)	
	Others	43 (43.4%)	46 (46.5%)	
Contact lens purchase source	optical shop	60 (60.6%)	72 (72.7%)	0.005*
	clinical practitioner	17 (17.2%)	21 (21.2%)	
	Online	22 (22.2%)	6 (6.1%)	
Contact lens wear time	3 hours or less	23 (23.2%)	19 (19.2%)	0.279
	4 to 7 hours	31 (31.3%)	42 (42.4%)	
	7-10 hours	22 (22.2%)	14 (14.1%)	
	more than 10	23 (23.2%)	24 (24.2%)	

Table 2. Frequency distribution of responses given by study subjects who temporarily or permanently discontinued CL usage due to reasons given below during COVID-19 Pandemic

Variables	Discontinuity	Strongly disagree		Disagree		Neutral		Agree		Strongly Agree	
		n	%	n	%	n	%	n	%	n	%
Limited access to purchase the CLs and their solution during lockdown	Temporary (n=23)	1	4.3	0	0	4	17.4	7	30.4	11	47.8
	Permanent (n=26)	0	0	4	15.4	14	53.8	1	3.8	7	26.9
	Total (n=49)	1	2.1	4	8.2	18	36.7	8	16.3	18	36.7
Reduced Social Activity	Temporary (n=23)	1	4.3	0	0	3	13	11	47.8	8	34.8
	Permanent (n=26)	4	15.4	0	0	1	3.8	6	23.1	15	57.7
	Total (n=49)	5	10.2	0	0	4	8.2	17	34.7	23	46.9
Financial restraint	Temporary (n=23)	1	4.3	0	0	5	21.7	1	4.3	16	69.6
	Permanent (n=26)	4	15.4	4	15.4	8	30.8	6	23.1	4	15.4
	Total (n=49)	5	10.2	4	8.2	13	26.5	7	14.3	20	40.8
Fear of acquiring infection	Temporary (n=23)	1	4.3	6	26.1	5	21.7	4	17.4	7	30.4
	Permanent (n=26)	0	0	10	38.5	1	3.8	4	15.4	11	42.3
	Total (n=49)	1	2.1	16	32.6	6	12.2	8	16.3	18	36.7
	Temporary (n=23)	0	0	0	0	4	17.4	6	26.1	13	56.5

\*p-value  $\leq 0.05$  is considered statistically significant

There were total of 49 (49.5%) individuals who discontinued contact lens usage during COVID-19 Pandemic. It was noted that out of these 49 study subject, 53.1% (n=26) individuals discontinued CL usage permanently from March to August 2020, whereas 46.9% (n=23) individuals temporarily discontinued the CL usage during the same time period. Out of all the study participants, 50.5% (n=50) individuals continued to follow the same contact lens wearing routine as before the COVID-19 pandemic.

When assessing the reasons focusing on either permanent or temporary discontinuation of contact lens usage i.e., 82.6% individuals discontinued their lenses temporarily because they thought spectacles provide protective covering or effect against coronavirus and another reason was the reduced social activities or lockdown. 78.2% individuals responded that limited access was the contributing factor for temporary discontinuation and decrease in the usage of contact lenses. 80.8% individuals discontinued their lenses permanently due to reduced social activities or lockdown and 57.7% individuals were agreed that they discontinued CLs due to fear of infection and spectacle provide protection during COVID-19 Pandemic.



## DISCUSSION

Contact lenses have many uses and primarily they are used for vision. Mostly people use contact lenses to look better. COVID-19 has changed a lot of daily practices in almost every aspect of life. Contact lens wear is no exception.

The aim of our study to see the change in pattern of CL wear during pandemic and to find the possible reason of CL discontinuation if they discontinued their lenses during COVID-19 Pandemic.

Another study shows similar results, out of total contact lens users (n= 385, 77%) were females and 75% users use contact lenses to correct refractive error. In current study (n=68, 68.7%) were using CLs for correcting eyesight and out of 99 individual 72 (72.72%) were females and 28 (28.28%) were males (Khan, et al., 2013). There is a little difference because of sample size.6-10

This study conclude that the (n=41, 41.4%) were agreed they reduced their CL wearing time, (n=29, 29.3%) were using their lenses normally as before pandemic and (n=29, 29.3%) individual were showing neutral attitude regarding the statement of reducing CL wearing time during COVID-19 that means few days they are wearing their lenses as usual and few days they changed their wearing time according to their need. Our study results showed an almost similar trend with Morgan, (2020) study where the contact lens wearing decreased a little, however, the ones using the lenses kept the normal routine. In the Morgan (2020) study, a four days survey was conducted on individuals using contact lenses. A response rate of 23 % was enrolled for assessment.11-15 Out of the total sample, eighty-nine percent percent of the cluster described that they were living in a tough 'lockdown' condition with the rest eleven percent reported to spend the life as per routine. Out of the individuals were self-isolated, twenty two

percent reported they were using their lenses like the routine before COVID-19, five (six percent) were using their lenses frequently than normal routine and the remaining sixty-four patients (seventy two percent) were wearing their lenses less than normal routine. Out of those who are living normally eleven individuals, six (fifty five percent) had a usual usage, forty-five percent reported that they were reducing their use of lenses. many replied that they were using their lenses less than usual since they did not have much need or activities that would require the use of lenses. Since the

most common activities or occasions of use were reported as when meeting friends or socializing (which wasn't possible due to COVID-19 restrictions). Individuals also reported that they were not much socializing, such as work, parties etc. due to which they did not feel like using lenses. Other reasons for decreased lens wear during lockdown included apprehension about infection (8 %), financial restraints (5 %), glasses being currently more convenient in all the protective measures (three percent), around three percent reported that they were using lenses less due to the inadequacy of availability of the lenses. Around three percent did not have any good reason to stop using lenses in pandemic. The same results were true for our study, where we concluded that the most common concern was a decrease in socializing causing reduced usage of lenses, and risk of infection causing a decrease inclination towards the use. Our results explained that the majority of individuals are lockdown who were using their contact lenses in the past causing a decreased trend in usage16

Our study results revealed that the second common reason for CL discontinuation as documented by 70.7% individuals was the idea of protective effects of the glasses against the ocular transmission of the disease. Literature supports the results

Recommendations are made that non-public protective equipment like eye protection (goggles or safety spectacles), together with face masks should be adopted to cut back the likelihood of infection through either airborne or transmission mechanisms. In the ophthalmology clinic, the employment of slit lamp shields is inspired to decrease the spread of COVID-19 among doctors because of examination.

Similar results were predicted by a study that wiped out Greece. it was reported that in the lockdown in Greece about 42.5% of the individuals believed that the chance of acquiring infection by using contact lenses was less (29%) and discontinuation was extremely effective (13.5%). Only a minority (18 %) of the participants do believe that the use of contact lenses during pandemics increases the chances of COVID-19 infection. This study presented the likelihood of reducing or ceasing the employment of CLs during the COVID-19 pandemic17

Contrary to our results, the study by Cordona (2021) highlighted the contact lens wear behaviors during COVID-19. A total of 247 individuals were included and their responses were analyzed. Around sixty-eight percent replaced their lenses every month, around seventy-five percent used proper cleanliness protocols

and solutions. Around eighty percent possessed the lens casing. These results were slightly different to our results however, our sample did not show a change in preference to a multipurpose solution as such. Due to the COVID-10 pandemic, around twenty-eight percent individuals stopped using lenses, around forty-nine percent reduced the use this was inconsistent with our study results. Patients showed decreased compliance towards

hygiene and maintenance of lenses. Around thirty-six percent individuals did not follow hand hygiene protocols, around thirty two percent avoided changing the lenses. Around twenty-three percent did not clean their cases to place lenses, and twenty-seven percent replied that they were not aware of the maintenance of lenses. They claimed that they were not adequately informed by the health care staff as to how to maintain lenses. There is little difference in these two studies because of study location and awareness in contact lens users.18-20

## CONCLUSION

Our study concludes that the individuals had increased the hygiene and replacement schedules for lenses. Almost half of the study subject discontinued contact lens wear during COVID-19 pandemic. The most frequent cause of discontinuation of contact lens wear was social isolation.

### 8. Recommendation:

The following points should be considered

- Educate the contact lens wearer they should maintain their hand hygiene practice whether there is COVID-19 or not.
- If the wearer is feeling sick then temporary discontinued their lenses and after recovery, resume wearing their lenses but use the fresh ones and dispose of the old contact lenses and their case
- A healthy individual can wear their lenses but should follow the proper cleaning and handling protocol.

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## Risk factors for shin splints in running sports

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### ABSTRACT

**Background and Objectives:** Shin splints is pain on anterior side of lower leg below knee and above ankle also called medial Tibial stress syndrome (MTSS). Shin splints are common in players participating in running sports. Risk factors for shin splints in these sports are over activity, playing on hard surface, using inappropriate foot wear, foot deformity in players, no warm up and no stretching. To study risk factors for shin splints in running sports in Lahore.

**METHODOLOGY:** A case control study was conducted in Lahore in 2017 in which 179 players were included and risk factors for shin splints were studied in these players. Data was collected from players, using self-structured questionnaire.

**RESULTS:** Odds ratio for stretching before running was 0.929, and odds ratio for inappropriate foot wear was 0.971, so they were not proved as risk factors for shin splints. Odds ratio for not warming up before running was 1.383, Odds ratio for players playing on hard surfaces was 1.262, Odds ratio for shin splints in players having any foot deformity was 1.048 and odds ratio for players running more than 100km per week was calculated 1.60 so these are proved risk factors. Mean age for players having shin splints was calculated as 22.2 and the range of age for players was 15 to 30.

**CONCLUSION:** Odds ratio for over activity, running on hard surface, foot deformity and players not warming up before running were more than 1, so they are proved as risk factors for shin splints. Two risk factors using inappropriate foot wear and stretching before running were not proved as risk factors for shin splints.

**KEYWORDS:** Shin plates, sports, medial tibial stress syndrome, players

### INTRODUCTION

As the involvement of people is increasing in sports, rate of acute and Overuse trauma is also increasing. If a sportsman performs over activity Stress will be on bones and muscles of lower limb (1). Now a days there is much more need to study injuries in running sports. 10% cases of injuries caused by over stressing the muscles are frequent in athletes. Pain of shin splints is relieved by resting. Tibial injuries are 75% because of its anatomical importance for runners which may cause leg pain symptoms, medial Tibial stress syndrome MTSS. Shin splints, compartment syndrome, and stress fractures. Feeling of pain is along posteromedial border medially and distally on Tibial surface. On clinical examination tenderness is present at the posterior and medial Tibial borders. Normal pulses on peripheral region and no changes in neurology present (2). Contributing factors for shin splints

includes hard training surface, any deformity in lower extremity, inadequate stretching, inappropriate foot-wear and inadequate strength. If symptoms overlap diagnosis will be difficult. Pain is localized on medial border of distal third of tibia. For diagnosis of shin pain most common test is palpatory test. Shin splints are necessary to diagnosed and rehabilitation is necessary (3). Foot deformities and running style also contributing factors in shin splints. So comparison of players with and without shin pain indicates players with foot deformity and landing on ground with eversion have more shin pain and have abnormal biomechanics. There may be excessive pronation present when causes shin pain. On the other hand training errors, shoe design, surface type decreased flexibility and biomechanics contribute in shin splints (4).

The term shin splints was used for many years for pain

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resulting on Tibial region after over activity in running sports .It is also known as medial Tibial stress syndrome .Shin splints is associated with pain after over activity and is exercise induced pain. There are many theories present which explain occurrence and diagnosis of shin splints. Shin splints is mainly diagnosed by periostitis and inflammation (5).Symptoms include pain. Inflammation, discomfort and increased intra compartmental pressure pain increases with activity and relieves with rest. Treatments includes orthotics NSAI,DS and ultrasound(4, 6). Shin splints is a long lasting chronic pain in an athlete causative factors for shin pain are anatomical ,physiological and environmental factors location of shin pain is medial side of tibia and lateral side of tibia on both upper and lower portions of tibia. Intra compartmental pressure is also increased (7).According to American Medical Association(AMA) definition shin splints is also known medial Tibial distress syndrome type2 its diagnosis can be made by following criteria as after repetitive activity on tough grounds player will have pain and discomfort in the leg , or due to over activity of foot flexors. Shin splints is diagnosed on the base of inflammation in shin region in case of fractures or ischemia it is not shin splints (8).

Tearing of muscle fibers at interface of bone and muscle at the muscle-bone interface is a cause inflammation and pain. Therapeutically treatment protocol includes biomechanical interventions (orthotics), NSAID's and ultrasound (9). Shin splints are localized pain in leg and Tibial bone. Shin splints can also mixed with other pathological conditions which cause lack of positive identification of shin splints. A study conducted on multiple aspects of injury of shin splints which included the factors and causes which could lead to shin splints. Investigation of risk factors of shin splints in females is also studied (10).Shin splints are characterized by pain on posteromedial border of tibia.it increases with activity and decreases with rest and on diffused area. On examination there is tenderness all other neurological conditions are normal (11). During running three types of forces act on muscles and these forces are compressive, tensile and shearing. These forces push muscles and deform them (12).

Shin splint is an injury which is very painful and constrains the performance of athlete. Both intrinsic and extrinsic factors causes shin splints. studies indicate that shin splints is not a compartment syndrome so it will not be mixed with compartment syndrome but periostitis is a etiology and it is a medical condition caused by inflammation of the periosteum, a layer of

connective tissue that surrounds bone. Some studies indicate changes in bone anatomy can be a cause for chronic shin pain. Shin pain may be felt on tibialis posterior and osseous .Shin splints that are caused by muscle weakness involved muscle may be flexor digitorum muscle. Shin splints may be acute and chronic, acute shin splints may include periostitis and sever pain while chronic shin splints may include minor fracture, muscle tear by compressive forces, and compartmental syndrome (8).

## METHODOLOGY

### STUDY DESIGN:

Case control study design was used.

### STUDY SETTINGS:

In Lahore:

- Football clubs of Lahore registered with Pakistan Football Federation Lahore:

1. Fame football club Lahore.
2. Choung football club Lahore.
3. Township Football club Lahore.

- Hockey clubs of Lahore registered with Pakistan Hockey Federation Lahore:

1. Pakistan national hockey team
2. Quaid -e-Azam hockey club
3. Nobel hockey club
4. Youngster hockey club
5. Johar town hockey club

- Rugby clubs of Lahore registered with Pakistan Rugby union.

1. Pakistan National Rugby team.
2. Rugby Union players

### DURATION OF STUDY:

This study was completed in 3months after approval of synopsis.

### SAMPLE SELECTION CRITERIA:

Inclusion criteria for cases:

- Players with shin splints.
- Both genders equally included.
- Players' ages should be 15 to 30.

Exclusion criteria for cases:

- Previous history of fracture of tibia.
- Presence of any other neurological or vascular pathology of lower limb.

Inclusion criteria for controls:

- Players without history of shin splints.
- Both genders equally included.
- Age should be 15 to 30.

Exclusion criteria for controls:

- Previous history of fracture of tibia.
- Presence of any other neurological or vascular pathology of lower limb.

## METHODOLOGY / DATA COLLECTION PROCEDURE:

A case control study was conducted in Lahore in 2017 in which 179 players were included and risk factors for shin splints were studied in these players. An informed consent was taken from the subjects included in study. Data was collected from players, using self-structured questionnaires.

### SAMPLE SIZE:

Sample size was 179 USING RAO SOFT with 95% confidence interval and 5% margin of error response distribution is 70% and population will be 400.

Formula is:

$$\begin{aligned}x &= Z(c/100)2r(100-r). \\n &= N \times / ((N-1) E^2 + x). \\E &= \text{Sqrt} [(N - n) x/n (N-1)].\end{aligned}$$

$n$  = the sample size.

$E$  = margin of error.

$r$  = the fraction of responses that you are interested in.  
 $Z(c/100)$  is the critical value for the confidence level  $c$ .

### SAMPLING. TECHNIQUE

Non probability convenient sampling technique was used.

## RESULTS

Mean age of players having shin pain 22.6 and mean age not having shin pain 23.7.

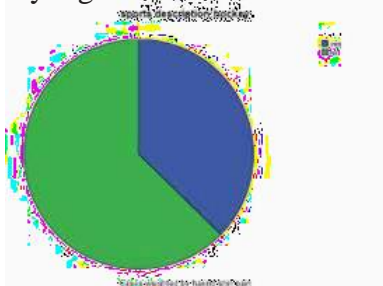
Total 179 players from Hockey, Soccer and rugby.

Female players were 17 and 162 were male players.

**Table 1: Socio-demographic profile of players having Shin Splints:**

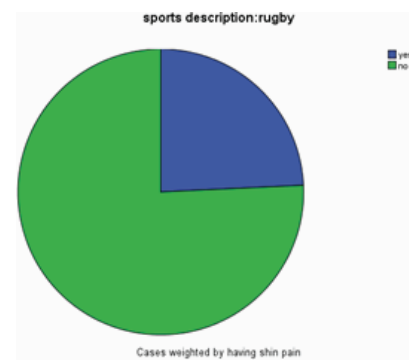
Socio-demographic profile:		Shin pain	
		Yes(cases)	No(controls)
Age( mean±Sd) (15-30)		22.2±3.581	23.7±2.8
Gender	Male	83	79
	female	7	10

This pie chart shows in hockey player's incidence of shin splints very high.



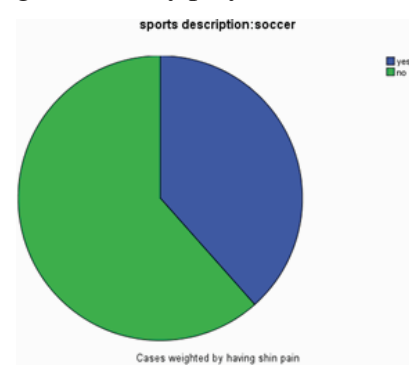
**Pie chart1: Incidence of shin splints in hockey players**

This pie chart shows in rugby players incidence of shin splints was low.



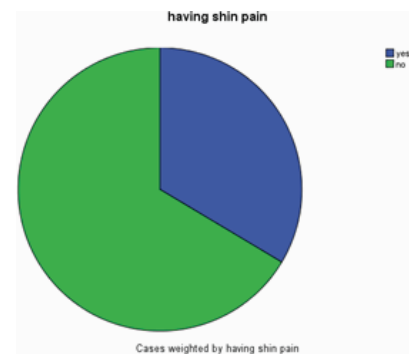
**Pie chart2: Incidence of shin splints in Rugby players:**

This pie chart shows in soccer players incidence of shin splints is high as hockey players.



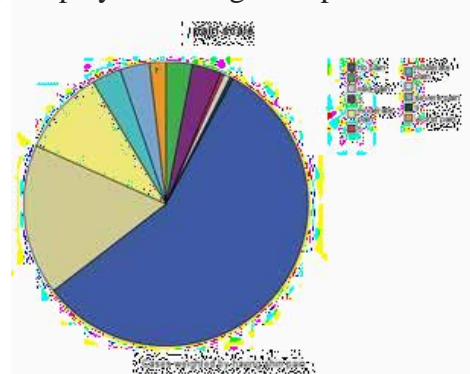
**Pie chart3: Incidence of shin splints in soccer players**

Large number of Players having shin splints.



**Pie chart4.Cases and controls**

Pain scale indicates incidence of shin splints pain high percentage of players having mild pain.



**Pie Chart5.VAS**

**Table2. Odds Ratio for relative risk factors**

Risk Factors		Shin Having splints		Odd's ratio value
		Yes	No	
1. No warm up	Yes	84	6	1.383(0.460-4.16)
	No	81	8	
2. No Stretching before running	Yes	76	14	0.929(0.409-2.410)
	No	76	13	
3.Hard training surface	Yes	66	24	1.262(0.661-2.410)
	No	61	28	
4.Inappropriate footwear	Yes	74	16	0.791(0.356-1.759)
	No	76	13	

## DISCUSSION

Stephen B Thacker in his study in 2002 about risk factors for shin splints found intrinsic and extrinsic risk factors for shin splint, intrinsic risk factors include age, gender, conditioning, physical defects and psychological defects. Extrinsic risk factors include type of sports played, equipment used by the players e.g. shoes, other extrinsic factors are playing surface and type of sports (8). In accordance with my study following risk factors, foot deformity 1.098, no warm up before running 1.383, and training on hard surface 1.262 have odds ratio more than one and were proved as risk factors for shin splints. Using inappropriate foot wear have Odds ratio 0.791 was not proved in my study. On the other hand in hockey players all of them use appropriate footwear while training but there training surface is hard, they train on ground with thin green carpet.

In another study in 2014 on 15 years old lifesaving competitor risk factors identified for shin splints are Foot posture is considered as main risk factor for shin splints. For checking foot deformity foot posture index (FPI) was used in this study (17). Odds ratio calculated for players having foot deformity was 1.04. Foot deformity was proved as Risk factor for shin splints in my study. It was proved if a player having any foot deformity including varus valgus or flat foot he will have shin splints. Those players having any foot deformity shin splints may become chronic.

Other studies in 1985 by Huges et.al and in 2003 by Kvale et.al on risk factors for shin splints identifies symptoms as pain on anterior two third of tibia and Medio lateral region of tibia. In these studies risk factors and etiology of shin splints was studied. Main risk factors identified in this study are excessive running, hard training surface, and gender and foot deformity (10, 12). In accordance with my study following risk factors, foot deformity 1.098, hard training surface 1.262 and players over training running more than 100 km per week odds ratio 1.86 over training was proved as a strong risk factor in my study. Risk factors identified in this study are approved risk factors and odds ratio calculated was more than one.

Another study in 1994 on incidence of shin splints in contact running sports risk factors were identified. Shin splints incidence increases by forceful contact to ground of players while running and jumping on hard surface (18). Odds ratio of players running on hard surfaces 1.2 so in accordance with my study this risk factor proved.

A study in 2001 conducted on high school runners in America defines etiology of shin splints as stress injury and it occurs in runners running long distances. In this study etiology for shin splints is based on three categories as training errors, interactions between inappropriate shoes and ground and anatomical deformities (4, 19). Odds ratio calculated for inappropriate footwear was 0.791 this risk factor not proved in accordance with my study. Foot deformity has odds ratio 1.04 was proved. For players running long distances more than 100 km per week odds ratio was 1.6 this risk factor proved. Training errors include training on hard surfaces, no stretching and no warm up. Odds ratio of players running on hard surfaces 1.2 so in accordance with my study this risk factor proved. Odds ratio for no warm up was 1.383 was proved and no stretching has odds ratio 0.929 was not proved in my study.

According to a study in 2014 by JP Difiori it was difficult to set a limit for over use of muscles. Studies indicate that players running more than 16 hours per week having more shin pain average half of a soccer match of equals running 12 km. Average range for overuse of muscles is 100 km per week (20). This risk factor approved strongly as a risk factor in accordance with my study. Odds ratio of players running more than 100 km per week was 1.6.

According to study in 2008 shin splints are caused by

over activity and diagnosed by pain at shin bone. Due to stress periostitis may be present a medical condition caused by inflammation of the periosteal, a layer of connective tissue that surrounds bone (3). Over activity is a proved risk factor in my study having odds ratio 1.6.

Study published by ministry of defense in 2008 in London. According to this study shin splints accounts for 6-16% injuries that occur in running sports. Main risk factors are as following over activity, foot deformity, no warm up, training on hard surfaces and no stretching (5). In my study odds ratio calculated for over activity running above 100 km per week was 1.6 which indicates that this is a strong risk factor anatomical foot deformities have odds ratio 1.098, no warm up 1.383, hard training surface 1.262 are proved risk factors and no stretching have odds ratio 0.929 was not proved in my study.

### CONCLUSION

This study was conducted to study risk factors for shin splints (MTSS) results shows incidence of shin splints in different age groups and also proves risk factors for shin splints. Mean age for players having shin splints was calculated 22.3 years. Players included in study having age range from 15 to 30. Relative risk factors for shin splints were studied in running sports like Hockey, Rugby and Soccer. There were six risk factors included in my study which are following any foot deformity 1.098, over activity running more than 100 km per week 1.6, warm-up 1.382, and running on hard surfaces 1.262, inappropriate foot wear 0.791 and no stretching 0.929 four of these risk factors having odds ratio more than one and were proved as risk factors two risk factors stretching before running and foot wear have odds ratio less than one and were not proved. If a player runs on a hard surface ground reactional forces were increased and caused shin splints. Foot deformity may contribute to chronic shin splints. Limitations:

Since shin splints can resemble other disorders, such as stress fractures, diagnosing them can be challenging. Furthermore, psychological issues like the anxiety of losing fitness could keep athletes from completely following rest schedules. Since there is no one-size-fits-all answer, a customized strategy is required. Economical or practical considerations may also restrict access to resources and expert care, such as physical therapy or custom orthotics.

Recommendation:

Athletes should wear suitable footwear, raise their exercise intensity gradually, and frequently stretch and

strengthen their lower leg muscles, especially the tibialis anterior and calves, to prevent and manage shin splints. Risk can also be decreased by choosing softer running surfaces, enhancing running form, and implementing cross-training. It's also crucial to treat any muscular imbalances and recuperate properly with rest days.

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#### Authors Contributions:

**Aziz Subhani:** Substantial contributions to the conception and design of the work.

**Rukhshanda Sarwer:** Design of the work and the acquisition. Drafting the work. Final approval of the version to be published.

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