Original Article

OPEN ACCESS

Knowledge and Attitude Regarding Needle Stick Injury among Undergraduate Nursing Students

Nazim Shahzad[1*], Raja[1], Tufail Ahmad[1] and Afsha Bibi[1]

[1]Faculty of Nursing and Midwifery, Ziauddin University, Karachi, Pakistan

ARTICLE INFO

ABSTRACT

Needle stick injuries pose a significant risk to undergraduate nursing students, potentially exposing them to serious infections. Understanding their knowledge and attitudes towards needle stick injury prevention is essential for enhancing safety protocols and education. **Objective:** To assess the level of knowledge and attitudes of nursing students regarding needle stick injuries. **Methods:** A cross-sectional study design was used to assess the knowledge and attitudes of undergraduate nursing students regarding needle stick injury. This study was conducted among 145 undergraduate nursing students at a private institute in Karachi Pakistan were included which was assessed by an online survey. **Results:** The students show a good knowledge score with a mean of 5.724 (SD=1.45). The range of accurate answers to each question ranges from 21.4% to 89.7%. 62.1% (n=90) show good knowledge. The students had a positive attitude toward needle stick injuries with a mean of 19.66 and SD=3.16. The students showed a positive attitude regarding needle stick injuries was 64.2% (n=93). **Conclusions:** It was concluded that students show good knowledge and a positive attitude towards needle stick injury. According to this study after performing nursing interventions recap of the syringe is recommended to decrease the risk of needle stick injury remains challenging, but overall knowledge was good and positive attitude of the students towards needle stick injury.

INTRODUCTION

Majority of the nursing students encounter certain side effects/challenges during clinical or training sites that compromise their safety or the safety of the client. One main challenge nursing students face is needle stick injury [1]. A penetrating/cut wound in the skin caused by a needle or sharp instrument in a healthcare setting is called a needle stick injury (NSI) [2]. NSIs are far more common in underdeveloped nations. In Pakistan, India, Nepal, and Nigeria, the yearly incidence of NSIs is typically more than 50% [3]. In India, the overall prevalence of needle stick injury among nursing college students was 16%. The majority of the students were aware of universal precaution guidelines, and 57% of students were aware of the diseases transmitted by NSI [4]. Globally the prevalence of NSIs reported among nursing students, the prevalence of NSI has ranged from 8.7 to 71% [5]. The frequency of NSIs among nursing students in Asia remains high. Approximately 60% of nursing students in China report experiencing at least one NSI while completing their clinical rotations [6]. The Italian Study on Human Immunodeficiency Virus (HIV) Occupational Risk stated that injuries due to occupational exposure to biological risks are the most common type of injury for healthcare workers, including both trainees and nursing students, and account for 41% of the total number of notifications. It is noted that two-thirds of these are related to needle stick injuries [7]. NSIs are a major problem for nursing students, like other healthcare providers, nursing students are not protected from sharp injuries because of their lack of knowledge and experience [8]. Pathogens such as HIV, Hepatitis B and C with post-exposure transmission rates of 0.4%, 30%, and 5–10, respectively, may be present in

02

individuals harmed by contaminated needle exposure [1]. The majority of the students have poor knowledge about safe injection techniques and NSIs, and they also engage in unsafe practices [9]. Nursing students must be taught about the details of NSI and how to prevent its effects. Literature is scarce on NSIs, especially with nursing students from developing countries like Pakistan [10]. The student nurses of Oman show the average score for all knowledge was 6.6 out of 10 (SD=2.1) and 18.2% (n=32) of the students sustained injuries from needle sticks, they reported that recapping needles was the primary cause of NSI (59%, n=19) [11].

The study aims to uncover knowledge gaps and attitudes that may increase the risk of NSIs by assessing these students' existing knowledge and attitudes. The study's ultimate goal is to improve nursing students' safety in clinical settings by encouraging improved preventive measures and a more knowledgeable and cautious handling of needles and sharp instruments.

METHODS

A descriptive cross-sectional study was conducted at a private nursing institute in Karachi Pakistan among undergraduate nursing students. All the enrolled nursing students were approached, while passed out students and those who didn't respond to the online survey or who gave incomplete information were excluded from the study. The simple random sampling technique was utilized for the study and sample size was calculated by OpenEpi by taking a 14.1% prevalence of NSI from the previous study [1] 95% confidence level and 5% confidence limit. The calculated sample size was n=145 by specifying the population of 600. Open accessed, structured and validated tools were used for assessing the knowledge and attitude of undergraduate nursing students [1]. The questionnaire consists of 12 questions, and consists of two parts, in the part first researcher asked for demographic data like gender, study year, and previous knowledge of NSI, and the second part had seven knowledge questions related to general knowledge of NSI, just like definitions of NSI, information about blood-borne diseases, and maximum capacity of sharps containers. Each question had two choices. The incorrect answer was worth 0; the correct answer was worth 1, the knowledge levels have been categorized into three tiers, namely poor, fair, and good. Therefore, percentage ranges less than 50% indicated poor knowledge, 50-75% represented fair knowledge, and greater than 75% signified good knowledge. The second section consisted of five statements about attitudes toward NSI. Responses fell between 1 and 5, using a Likert-type scale with five points: "Strongly Agree 5," to "Strongly Disagree 1"). Classifying into three attitude levels based on score ranges: a score of 12 or less indicated poor attitude, scores from 13 to 18 represented fair attitude, and scores from 19 to 25 signified good attitude. After the approval was

held from the ethical review committee at the Institute of Nursing and Allied Health Sciences where the study was conducted, with approval number (HSNHS/2024/098). Students were provided with a Google Forms study that was administered via WhatsApp. Information about the study with its aims was sent together with guidelines and instruments for participants' guidance in answering the questionnaire. By submitting the completed online questionnaire, the participants gave consent to take part in the research. These surveys were sent several times to prompt the students to complete them. The research study was conducted in two months from August to September 2024. To avoid a repeat of the survey, there was a restriction on the number of times a participant can take the survey. Data were analyzed by using SPSS version 22.0. For descriptive analysis, mean (S.D) was used for parametric data and non-parametric data, and median IQR was viewed. For the categorical variable, frequency and percentages have been calculated. To determine the association with demographic variables Chi-square or Fisher's exact test has been applied.

RESULTS

A total of 145 (n=145) students filled out the online Google form in which 30.3% (n=44), 32.4% (n=47) and 37.2% (n=54) 2nd year, 3rd year and 4th-year students were assessed respectively. Most of the students were male students 74.5% (n=108) and female students were 25.5% (n=37). Regarding previous education most of the students 56.6% (n=82) have received formal training on NSI prevention and management and the other 43.4% (n=63) did not receive any formal training on NSI prevention and management (Table 1).

Table 1: Demographic Characteristics of Study Participants

Category	n (%)
Total Students	145 (100)
Year of Study	
2nd Year	44 (30.3)
3rd Year	47 (32.4)
4nd Year	54 (37.2)
Gender	
Male	108 (74.5)
Female	37 (25.5)
Previous Education on NSI Prevention	
Received Formal Training	82 (56.6)
Did Not Received Formal Training	63 (43.4)

The total NSI knowledge ranged from 1 to 7 with a mean of 5.724 (SD=1.45). The range of accurate answers to each question ranges from 21.4% to 89.7%. "NSI is defined as wounds caused by needles that accidentally puncture the skin" received the highest accurate answer percentage 89.7% (n=130). The lowest accurate answer percentage 21.4% (n=31) was for the question "Recap of the syringe

Shahzad N et al.,

upon completion of nursing care should be performed to reduce the possibility of a needle stick injury". Majority of the students showed good knowledge regarding NSI 62.1% (n=90), 29% (n=42) students had fair knowledge about NSI and only 9% (n=13) students had poor knowledge about NSI (Table 2).

Table 2: Level of Knowledge regarding NSI among study participants

Level of Knowledge	n (%)
Poor Knowledge	13 (9)
Fair Knowledge	42 (29)
Good Knowledge	90 (62.1)
Total	145

Knowledge-related statements from students were noted (Table 3).

Table 3: Knowledge-Related Statements among study participants

No	Statement	True n (%)	False n (%)
1	Needle stick injuries are wounds from needles that accidentally puncture the skin.	130 (89.7)	15 (10.3)
2	Recap of the syringe upon completion of nursing care should be performed to reduce the possibility of a needle stick injury (False*).	114 (78.6)	31 (21.4)
3	Technics and Safer devices, gloves should be worn to prevent needle stick accidents.	120 (82.8)	17 (11.7)
4	Hepatitis B & C, and HIV, are the blood-borne pathogens most f frequently exposed to by health care providers when they experience NSI	128 (88.3)	17 (11.7)
5	The maximum capacity of a sharp container is 75%.	105 (72.4)	40 (27.6)
6	Soap and water use wash area to minimize the risk of infection after having had NSI.	112 (72.2)	33 (27.6)
7	Dispose in a sharp container practice minimizes injury risk.	121 (83.4)	24 (16.6)

The level of attitude was recorded (Table 4).

Table 4: Level of Attitude towards NSI among study participants

Level of Attitude	N (%)
Poor Knowledge	4 (2.8)
Fair Knowledge	48 (33.1)
Good Knowledge	93 (64.1)
Total	145

In general, the students show a positive attitude regarding NSI the mean score is 19.66, the range is 16.00, and SD=3.16. likewise, 64.1% (n=93) students showed a good attitude toward NSI, some students 33.1% (n=48) had a fair attitude toward NSI and just 2.4% (n=4) students had a poor attitude regarding NSI. More than half 82(56.6%) of the study participants agreed to report NSI immediately 36.6% (n=53) strongly agreed that NSI is the most

common event and 40.7% (n=59) agreed that NSI is the most common event and 44.8(n=65) were believed (Table 5).

Table 5: Attitude-Related Statements among study participants

No	Attitude Statements	Strongly Agreen (%)	Agreen n (%)	Neutral n (%)	Disagree n (%)	Strongly Disagree n (%)
1	Report NSI Immediately	82 (56.6)	45 (31.0)	9 (6.2)	5 (3.4)	4 (2.8)
2	I Am Worry About NSI	48 (33.1)	51 (35.2)	19 (13.1)	12 (8.3)	15 (10.3)
3	NSI Is a Common Event	53 (36.6)	59 (40.7)	21 (14.5)	10 (6.9)	2 (1.4)
4	NSI Is Neglected	25 (17.2)	43 (29.7)	21 (14.5)	44 (30.3)	11 (7.6)
5	I Think NSI Is Preventable	65 (44.8)	57 (39.3)	15 (10.3)	6 (4.1)	2 (1.4)

DISCUSSION

The knowledge and attitudes of nursing students regarding NSIs are thoroughly examined in this study, which also identifies areas of strength and potential improvement in NSI management and prevention. Upon juxtaposing these results with global research, several revelations become apparent. The highest risk to nursing students during clinical trials is NSIs because they result from unintentional contact with contaminated blood and bodily fluids can compromise patient safety [1]. The current study showed remarkable findings about nursing students' knowledge regarding NSIs. The knowledge level among nursing students in this study, with a mean score of 5.724 (SD=1.45), is relatively high. This is consistent with findings from other studies conducted in different countries. The low accuracy of 21.4% for the question on syringe recapping contrasts with findings from international studies such as those by [12] in Pakistan, where 80% of participants correctly identified that recapping syringes is not recommended. In addition, students have enough knowledge about NSI. This finding is consistent with a study done in Saudi Arabia where participants also had sufficient knowledge regarding NSI [1] and contrasted with global investigations indicating students' insufficient knowledge about NSI [13-15]. A notable proportion of nursing students has prior knowledge of and understanding of NSIs which points out that they have been in contact with the causes as well as the risk factors of these practices. Moreover, nursing students are at high risk of blood-borne pathogens transmitted via NSI [16]. This can be attributed to the fact that senior nursing students had taken more courses and spent more time learning and practicing infection control techniques making them better than their junior colleagues. This finding bridged the gap between the need for an extra year to prepare students for infection control and the other factors affecting their performance in clinical practices. As for NSI management, a favourable perception was recorded with a mean score of 19.66 (SD=3.16). This

04

favourable perception is consistent with other studies. For instance, one study reported that a large proportion of registered nurse students in Turkey were willing to prevent NSIs [17], displaying an inclination that was also evident in our study. The opinions of the participants toward NSI were favourable and in line with a prior study [1] which was similar to an international study that revealed positive attitudes among nursing students towards NSI [18]. The positive attitudes of students attest to the fact that nursing schools are the best setting for improving students' decision-making abilities and increasing their awareness of and behaviour regarding NSI attitudes before transmission in clinical practice [19]. However, the study also revealed areas of concern regarding attitudes, such as a smaller proportion of students believing NSIs are preventable (44.8%). This contrasts with a study in India, where 65% of nursing students believed in the preventability of NSIs [20]. This discrepancy highlights a potential area for improvement in fostering a belief in the effectiveness of preventive measures. There were also limitations on this investigation. The use of online surveys for data collection may result in recall bias and inaccurate conclusions. The study's limited generalizability may stem from its execution in a single private nursing college. However, there isn't much research about injuries and safety issues in nursing education in Pakistan, therefore this study fills the gap in knowledge in that area. Future research is strongly encouraged, especially with students pursuing careers in healthcare.

CONCLUSIONS

It was concluded that the students showed good knowledge and a positive attitude towards NSI. According to this study after performing nursing interventions recap of the syringe is recommended to decrease the risk of NSI remains challenging, but overall knowledge was good and positive attitude of the students towards NSI.

Authors Contribution

Conceptualization: NS
Methodology: TA
Formal analysis: R
Writing review and editing: AB

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

Conflicts of Interest

The authors declare no conflict of interest.

Source of Funding

REFERENCES

[1] Al-Mugheed K, Farghaly SM, Baghdadi NA, Oweidat I, Alzoubi MM. Incidence, Knowledge, Attitude and Practice Toward Needle Stick Injury among Nursing Students in Saudi Arabia. Frontiers in Public Health. 2023 May; 11: 1160680. doi: 10.3389/fpubh.2023.1160680.

[2] Dhayagude S, Tolpadi A, Mane A, Modak M. Financial Impact of Needle Stick Injury on a Tertiary Care Teaching Hospital. Clinical Epidemiology and Global Health. 2024 Sep; 29: 101726. doi: 10.1016/j.cegh.2024.101726.

[3] Abdallah M. Assessment of Knowledge, Attitude & Practice of Primary Health Care Workers Toward Needle Stick Injury. Journal of Cardiovascular Disease Research. 2021; 12(7): 192-210.

[4] Ramya MR, Geetha M, Lakshmi N, Jawahar SS. A Study of Needle Stick Injuries among Nursing College Students in a Tertiary Care Hospital in Chengalpattu District, Tamil Nadu. Journal of Indian Association of Preventive and Social Medicine. 2021; 12(3): 60-67. doi: 10.51957/Healthline_235_2021.

[5] Abdelmalik MA, Alhowaymel FM, Fadlalmola H, Mohammaed MO, Abbakr I, Alenezi A et al. Global Prevalence of Needle Stick Injuries among Nurses: A Comprehensive Systematic Review and Meta-Analysis. Journal of Clinical Nursing. 2023 Sep; 32(17-18): 5619-31. doi: 10.1111/jocn.16661.

[6] Wang D, Anuwatnonthakate A, Nilvarangkul K. Knowledge Attitude and Practice Regarding Prevention of Needle Stick Injuries among Nursing Students in Henan Province, China. Journal of the Pakistan Medical Association. 2021 Oct; 71(10): 2-420. doi: 10.47391/JPMA.03-429.

[7] Bagnasco A, Zanini M, Catania G, Watson R, Hayter M, Dasso N *et al.* Predicting Needle Stick and Sharps Injuries in Nursing Students: Development of the SNNIP Scale. Nursing Open. 2020 Sep; 7(5): 1578-87. doi: 10.1002/nop2.540.

[8] Amer RK. Nursing Students' Knowledge and Practices Related to Sharp Object Injury and Management at A University in the Western Cape Province (Doctoral dissertation, Cape Peninsula University of Technology). 2019.

[9] Ibrahim S, Salem N, Soliman S. Assessment of Safe Injection Practices and Needlestick Injury among Nursing Students at Mansoura University. Mansoura Nursing Journal. 2021 Jan; 8(1): 59-76. doi: 10.21608/mnj.2021.179797.

[10] Irshad R, Ateeb M, Bibi A, Asif M, Jabbar S. Assessment of Knowledge and Practice About Needle Stick Injury among Nurses at Nishtar Hospital

in Multan; A hospital-based cross-sectional study. International Journal of Natural Medicine and Health Sciences. 2023 Mar; 2(2): 27-34.

[11] Al Qadire M, Ballad CA, Al Omari O, Aldiabat KM, Shindi YA, Khalaf A. Prevalence, Student Nurses' Knowledge and Practices of Needle Stick Injuries During Clinical Training: A Cross-Sectional Survey. BioMed Central Nursing.2021 Dec; 20: 1-7. doi: 10.1186/s12912-021-00711-2.

[12] Khan R and Pari B. Impact of Needle Stick Injuries On Student Nurses at Kth Hospital, Peshawar, Pakistan. Quantum Journal of Social Sciences and Humanities. 2023 Aug; 4(4): 268-76. doi: 10.55197/qjssh.v4i4.280.

[13] Almuslami OK, Fadul SS, Munshi SS, Sangoof FM, Mersal NA. Awareness and Prevalence of Needle Stick Injury among Nursing Students at King Abdulaziz University. Evidence-Based Nursing Research. 2022 Aug; 5(1): 14-23. doi: 10.47104/ebnro js3.v5i1.266.

[14] Ali M, Bibi A, Khan J, Arshad S, Durdana M, Musafir Y. Student Nurses Knowledge of Needle Stick Injuries at a Private Institute, Karachi: Nurses Knowledge of Needle Stick Injuries. Pakistan Journal of Health Sciences.2023 Apr; 4(4): 79-83. doi: 10.54393/pjhs.v 4i04.662.

[15] Madhumitha M, Kumar MS, Gurunathan D. Awareness of Needle stick Injury among Undergraduate Students. Drug Invention Today. 2019 Mar; 11(3): 773-779.

[16] Suliman M, Al Qadire M, Alazzam M, Aloush S, Alsaraireh A, Alsaraireh FA. Students Nurses' Knowledge and Prevalence of Needle Stick Injury in Jordan. Nurse education today.2018 Jan; 60: 23-7. doi: 10.1016/j.nedt.2017.09.015.

[17] Bilek Ö, Kiran S, Duygulu S, Yıldız AN. The Awareness and Empowerment Aspects of the Needle Sticks and Other Sharps Injuries and Reporting in Nursing Education: A Cross-Sectional Survey. Workplace Health & Safety.2022 Sep;70(9): 421-30.doi: 10.1177/21650799211049810.

[18] Ditching NA, F Furatero AG, S Iquiña RV, M Sabulao AD, Supremo JM, Oducado RM. Factors Associated with Nursing Students' Intention to Report Needle Stick Injuries: Applying The Theory of Planned Behavior. Nurse Media Journal of Nursing.2020; 10(3): 234-243. doi: 10.14710/nmjn.v10i3.31975.

[19] Rababa M, Bani-Hamad D, Hayajneh AA, Al Mugheed K. Nurses' Knowledge, Attitudes, Practice, and Decision-Making Skills Related to Sepsis Assessment and Management. Electronic Journal of General Medicine. 2022 Dec; 19(6). doi:10.29333/ejg m/12556.

[20] Mahajan P, Shinde S, Pandey N, Sharma Y, Kousal V, Bavoria S. Needle Stick Injuries as an Occupational Hazard: Awareness, Perception and Practices Amongst Nurses in A Premier Tertiary Care Hospital of Northern India. European Journal of Molecular and Clinical Medicine. 2022; 9(03).