

ASSESSMENT OF KNOWLEDGE REGARDING NEEDLE STICK INJURY AMONG UNDERGRADUATE NURSING STUDENTS IN KARACHI, PAKISTAN

Awais Masih¹, Danish Ahmed Khan^{*2}, Noman Dilshad³, Simran Javed⁴, Sahar Zeb⁵

^{1,3,4,5}Jesus and Mary Institute of Nursing and Allied Sciences Karachi

^{*2}Male College of Nursing, Sindh Government Hospital Liaquatabad Karachi

²danish_khan864@hotmail.com

DOI: <https://doi.org/10.5281/zenodo.21056225>

Keywords

Needle Stick Injury, Nursing Students, Knowledge, Socio-demographic Variables, Association.

Article History

Received: 24 April 2026

Accepted: 06 June 2026

Published: 21 June 2026

Copyright @Author

Corresponding Author: *

Danish Ahmed Khan

Abstract

Objectives:

To assess the knowledge of Needle Stick Injuries (NSIs) among undergraduate nursing students

Method:

An analytical cross-sectional study design was utilized. Nursing students of Jesus and Mary Institute of Nursing & Allied Sciences and College of Nursing, Sindh Government Hospital Liaquatabad Karachi, comprised the study population. Convenient, non-probability sampling was used, with a target sample of 173, calculated using Open EPI. To evaluate the relationship of the socio-demographic variables, Independent t-test and ANOVA were used.

Results:

The results of current study showed that 88.4% of nursing students had a high level of NSI knowledge, and 11.6% had a low level of NSI knowledge. Knowledge of NSIs, was significantly associated with the study year ($p = 0.022$) and family income ($p = 0.030$).

Conclusion:

Most of the nursing students had adequate knowledge of needle stick injuries, and knowledge of NSIs was significantly associated with the study year and the level of family income. To enhance understanding and reduce the risks related to work, ongoing education and training on infection control should be implemented.

INTRODUCTION

Needle-stick injury (NSI) presents risks for blood-borne infections and requires students to engage in extra unsafe practices during the training where the students are most likely to become stressful and perform many invasive procedures.[1] Reporting NSIs is a challenge and leads to more blood infection and mental illness risks to the healthcare workers. Problems related to needle recapping and NSI reporting are still present even with the existing knowledge of the problems. [2] NSIs is regarded as an occupational risk for nurses,

and potential exposure to HIV, HBV, and HCV is a concern as the prevalence of injuries is high in Jeddah, Saudi Arabia. To protect nurses, appropriate training and safety measures are needed. [3] Needle-stick and sharps injuries (NSSIs) present risks to almost one-third of the healthcare workers in Northwestern Ethiopia. [4] NSIs are a concern to the healthcare workers in a surveyed area and almost one-third of the nurses had reported NSSIs. NSSIs are caused by unsafe working conditions and poor management of contaminated sharps. [5]. Needlestick injuries are

challenges faced by nursing students due to incidents that occur during blood draws, injections, needle cap removals, and improper disposal of used needles. Once a needlestick injury occurs, nursing students are vulnerable to blood-borne infections such as HIV and Hepatitis B and C. It is noted that needlestick injuries are underreported due to lack of knowledge regarding the needlestick injury reporting procedure and fear. There is a correlation that shows a lack of knowledge of the procedure and fear of injury result in higher incidences of needlestick injuries as a result of a lack of compliance with procedures. [6] It is estimated that the global prevalence for needlestick injuries that occur among the nursing population is between 19% and 76%. It is agreed that the lack of adherence to basic procedures and disposal of needles contributes to needlestick injuries. Research that adopts the Health Belief Model and focuses on needlestick injuries shows that having training sessions improves participants' knowledge, increases their perceived susceptibility to needlestick injuries, and allows them to better implement procedures to mitigate risks associated with needlestick injuries. [7] Every year, millions of nursing staff are exposed to needlestick injuries. Developed countries such as Pakistan are aware of the risks, but safety procedures are not implemented. This is due to accidental injuries, careless disposals, lack of training. [8] NSI is widespread among Healthcare practitioners, caused by behaviors like recapping and disposing of needles incorrectly, along with negligence. After an injury, stress and fear are the emotional issues the injured person worsens the condition. Research shows that due to the lack of clinical experience, nursing students are at a greater risk. Taking the initiative to vaccinate and apply interferon control measures prevents NSI. [9] World-wide, NSIs are a common hazard for professional nurses. Due to NSIs, the WHO states that there is a high probability of catching HBV, HCV, and HIV, and the prevalence is about 46-51% in countries like Iran. NSIs are the result of inadequate clinical skills and negligence; therefore, nurses who have a high level of clinical competence are more likely to follow safety measures, thus reducing needle stick injuries. [10]

Furthermore, there is a high occurrence of needle stick injuries (NSIs) in nursing students, with some reports indicating a 64.5% occurrence. In nursing education, NSIs go unreported, as does a lack of knowledge on safety precautions and infection control. Also, the unsafe practices of needle stick recapping and needle stick disposal, along with a lack of monitoring, contribute to NSIs among nursing students. [11] The prevalence rate of NSIs among nursing students, during the early phase of clinical practice, is between 18% and 60%, and is influenced by the educational background of the nurse. [12] This is the current situation in many clinical areas for nursing students, especially in high risk areas of the clinic, such as the surgery and medicine wards. The primary cause of NSIs in the clinical areas is broken ampules and safety not being a priority. The hurried practice, carelessness, and lack of personal protective equipment also contribute to NSIs. [13] The SNNIP scale indicates the perception and behavior of nursing students, and shows that 39% of nursing students suffer NSIs when they perform injections. Importantly, inexperienced second-year students are likely to be high-risk students. Behaviors can be influenced by perceived obstacles and benefits of preventive behaviors. Education and simulation will have an impact on injury occurrences. [14] Needle stick injury continues to be a major global occupational health issue for nursing students due to the potential of disease exposure. Students are conscious of the dangers of disease. However, awareness of prevention methods, such as vaccination, is lacking. [15] Needle stick injuries occur to nursing students despite initial prevention training. Studies show a predominant, yet insufficient, safety knowledge and practice. The most common hazards are the recapping of needles and inappropriate disposal of equipment. Among nursing students, there is a documented knowledge gap of the importance of post-exposure prophylaxis. [16] Results of the systematic review showed that around 35% of nursing students globally, experience NSIs, with the most cases in Asia. Nursing students in their practice are especially vulnerable. Fear and social stigma have led to underreporting NSIs as high as 63%. In

order to promote reporting NSIs, an adequate injury prevention framework and workshops are required. [17] Needle stick injuries are a global nursing student health and safety issue. Insufficient safety practices and observance are the main drivers. Global high incidences with inadequate reporting have been documented. Immunization, infection control training, and simulation education all support the prevention of infection control. Infection reporting practices also must be developed [18]. The objectives of this study are to assess the knowledge regarding needle-stick injuries among BS nursing students and determine the association between knowledge regarding needle-stick injuries and selected demographic characteristics of BS nursing students.

METHODs

An analytical cross-sectional study design was used to assess the knowledge of needle stick injuries among nursing students. The study is conducted nursing students at Jesus and Mary Institutes of Nursing and Allied Health Sciences and Male College of Nursing, Sindh Govt. Hospital Liaquatabad Karachi. The study was conducted from January to March 2026. A convenience sampling technique is used to select participants who met inclusion criteria. The sample size was estimated to be 173 participants, on the prevalence of Knowledge About Needle Stick Injuries as 22.4%, at 95% confidence, with an 80% power of study, 5% margin of error, and the estimated population size of 500, was calculated in the open EPI Software as a one sample proportion test. Inclusion criteria involves 2nd, 3rd, and 4th year BS nursing students those willing to participate, while 1st Year BS nursing students were excluded. Prior to the data collection, permission was secured from the relevant nursing institutes. Participant consents were secured. A self-developed questionnaire was used for data collection. Prior to the main study, a pilot study

was conducted on 10 participants to assess the reliability of the tool. The collected pilot data were entered and analyzed using SPSS. The reliability of the questionnaire was tested using Cronbach's alpha, which showed a value greater than 0.82, indicating good reliability and validity of the instrument. Data Analysis were done using SPSS software Version 25 using descriptive statistics, independent t-test and ANOVA were used as statistical tests.

RESULTS

Table 1 presents the results of the investigation conducted on 173 respondents focusing on their socio-demographic variables. Focusing on the age variable in data collected, the age group that dominated was 18-22 years, at (49.1%), while the second highest was age group 23-28 years, at (48.6%). The age group above 28 years ranked last, making up only (2.3%). Concerning gender, majority were males at (90.2%) while females were only (9.8%). Focusing on their marital status, majority (83.2%) were single, while (15.6%) were married, and (1.2%) were in the other category. Respondents from second year dominated the survey at (67.6%), while respondents in third year and fourth year were at (17.3%) and (15.0%) respectively. The dominant family structure was nuclear, making up (56.1%) of the respondents, while the rest came from extended family structures. Focusing on participants' places of residence, the highest percentage (67.6%) resided with their families, (24.9%) resided in hostels while (7.5%) resided with friends. On family income, majority (41.6%) fell into the income bracket of PKR 50,000-100,000, while (29.5%) of the respondents earned less than PKR 50,000. The rest of the respondents (22.5%) reported earning PKR 100,000-200,000, while only (6.4%) of the respondents earned over PKR 200,000. Focusing on substance abuse, only (9.8%) of the respondents reported substance abuse, while (90.2%) were in the non-abusing category.

Table 1: Socio-demographic characteristics

Socio-Demographic Variables	Characteristics	N (%)
Age	18-22	85 (49.1)
	23-27	84 (48.6)
	28-Above	4 (2.3)
Gender	Male	156 (90.2)
	Female	17 (9.8)
Marital Status	Married	27 (15.6)
	Unmarried	144 (83.2)
	Others	2 (1.2)
Academic Year	Second year	117 (67.6)
	Third year	30 (17.3)
	Fourth year	26 (15.0)
Family	Extended	76 (43.9)
	Nuclear	97 (56.1)
Residence	Family	117 (67.6)
	Friends	13 (7.5)
	Hostel	43 (24.9)
Family Income	Below 50K	51 (29.5)
	50K-100K	72 (41.6)
	100K-200K	39 (22.5)
	Above 200K	11 (6.4)
Substance Abuse	Yes	17 (9.8)
	No	156 (90.2)

Table 2 results indicated that the majority of the nursing students, 88.4%, had good understanding of Needle Stick Injury. Meanwhile, 11.6% of the total sample had poor knowledge of Needle Stick Injury.

Table 2: Level of Knowledge

Level of Knowledge	Percentage	Scores Obtained
Good Knowledge	88.4 %	Above 50%
Poor Knowledge	11.6 %	Below 50%

Table 3 shows demographic variables and knowledge level score associations. Age with knowledge had no significant relationship with ($p= 0.194$). Knowledge and gender had no significant relationship ($p =0.927$). Knowledge with marital status had no significant difference ($p =0.102$). Knowledge level was not significantly

associated with type of residence ($p =0.272$). Knowledge level was not significantly associated with family structure ($p =0.402$). Knowledge level was also not significantly associated with variables like substance abuse ($p =0.722$). The significant relationships were found with academic year and family income with ($p =0.022, 0.030$).

Table 3: Association of demographic variables with Knowledge level score

Variables	Mean \pm SD	N	P- Value
Age			
18-22	6.51 \pm 1.875	85	0.194
23-27	6.92 \pm 1.523	84	
28- Above	7.50 \pm 1.000	4	
Gender			
Male	6.72 \pm 1.766	156	0.927
Female	6.76 \pm 1.033	17	
Marital Status			
Married	7.22 \pm 1.625	27	0.102
Unmarried	6.66 \pm 1.710	144	
others	5.00 \pm 0.000	2	
Degree Year			
2 nd Year	6.63 \pm 1.794	117	0.022*
3 rd Year	7.47 \pm 1.613	30	
4 th Year	6.31 \pm 1.087	26	
Family			
Extended	6.61 \pm 1.804	76	0.402
Nuclear	6.82 \pm 1.627	97	
Residence			
Family	6.61 \pm 1.771	117	0.272
Friends	6.62 \pm 1.121	13	
Hostel	7.09 \pm 1.645	43	
Family Income			
Below 50K	6.62 \pm 1.724	51	0.030*
50K-100K	6.93 \pm 1.647	72	
100K-200K	7.15 \pm 1.647	39	
Above 200K	6.27 \pm 1.737	11	
Substance Abuse			
Yes	6.59 \pm 1.583	17	0.722
No	6.74 \pm 1.722	156	

DISCUSSION

This study investigates the association between socio-demographic factors and awareness of needlestick injuries among nursing students. The findings of this study show that the majority of nursing students have a good level of knowledge on needlestick injuries (88.4%). This is similar to a study conducted in Pokhara, Nepal, which showed that 90.1% of study participants had knowledge of needlestick injury in a descriptive cross-sectional study [19]. As for socio-demographic factors, age is assumed not to be associated with the knowledge score, in line with a study conducted in Kirkuk City, where no

significant relationship was found between age and knowledge of needlestick injuries. Gender is also assumed not to be associated with the knowledge score. This assumption is also in line with the study conducted in Kirkuk City, which showed no significant relationship between gender and knowledge of needlestick injuries [20]. However, in a study conducted at Khyber Teaching Hospital, Peshawar, Pakistan, a significant association was found between gender and needlestick injuries [21]. These differences can be attributed to a range of factors, including study design and setting, among others. In contrast to gender, education may be expected to

have an association with knowledge of needlestick injuries; students of the senior class may possess better knowledge due to the exposure of advanced theoretical learning and practical experience and teaching during the study process. [22] In a descriptive cross-sectional study conducted in Karachi, Pakistan, needle stick injury knowledge was investigated in relation to multiple sociodemographic categories. It was determined that education was the only category that was significantly associated with knowledge regarding needle stick injuries [23].

CONCLUSION

According to the study, many nursing students were knowledgeable about NSIs. The level of knowledge was significantly linked to the academic year and family income. To enhance understanding and reduce the risks related to work, ongoing education and training on infection control should be implemented. NSI prevention training should take place regularly, clinical supervision during practice should be improved, Safe disposal of needles along with infection control must be practiced properly, future research should have a larger sample size and be done in different institutes.

REFERENCES

1. Keicher F, Zirkel J, Leutritz T, König S. Combatting the occurrence of needle-stick injuries in a medical school: why is it still an issue? *BMC Med Educ.* 2024;24:312. doi:10.1186/s12909-024-05309-1.
2. Alsabaani A, Alqahtani NSS, Alqahtani SSS, Al-Lugbi JHJ, Asiri MAS, Salem SEE, Alasmari AA, Mahmood SE, Alalyani M. Incidence, knowledge, attitude and practice toward needle stick injury among health care workers in Abha City, Saudi Arabia. *Front Public Health.* 2022 Feb 14;10:771190. doi:10.3389/fpubh.2022.771190.
3. Alharazi R, Almutary H, Felemban O, Alariany AS, Alshamrani FA, Hawsawi EH, Alsulami LM. Prevalence of needle stick injuries among nurses in Jeddah, Saudi Arabia. *Nurs Res Rev.* 2022 Dec 14;12:235-246. doi:10.2147/NRR.S376343.
4. Berhan Z, Maleda A, Gizeyatu A, Sisay T, Lingerew M, Kloos H, et al. Prevalence and associated factors of needle stick and sharps injuries among healthcare workers in northwestern Ethiopia. *PLoS One.* 2021 Sep 24;16(9):e0252039. doi:10.1371/journal.pone.0252039.
5. Liyew B, Sultan M, Michael M, Tilahun AD, Kassew T. Magnitude and determinants of needlestick and sharp injuries among nurses working in Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia. *Biomed Res Int.* 2020 Dec 18;2020:6295841. doi:10.1155/2020/6295841.
6. 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. *Front Public Health.* 2023 May 4;11:1160680. doi:10.3389/fpubh.2023.1160680.
7. Ledinski Fičko S, Mlinar M, Hošnjak AM, Smrekar M, Kurtović B, Babić J. Nursing student's knowledge about understanding and prevention of needle stick injury. *Croat Nurs J.* 2020 Mar 30;4(1):73-80. doi:10.24141/2/4/1/6.
8. Alinejad N, Bijani M, Malekhosseini M, Nasrabadi M, Afzali Harsini P, Jeihooni AK. Effect of educational intervention based on health belief model on nurses' compliance with standard precautions in preventing needle stick injuries. *BMC Nurs.* 2023 Jul 18;22:180. doi:10.1186/s12912-023-01347-0.
9. Gulnaz M, Rasool G, Ullah S, Salamat S, Hyder A, Majeed S. Knowledge regarding needle stick injury among nurses of tertiary care hospitals of Lahore. *NURSEARCHER J Nurs Midwifery Sci.* 2024 Jun 30;4(2). doi:10.54393/nrs.v4i02.85.
10. Khan R, Pari B. Impact of needle stick injuries on student nurses at KTH Hospital, Peshawar, Pakistan. *Quantum J Soc Sci Humanit.* 2023 Jul 20;4(4):268-276. doi:10.55197/qjssh.v4i4.280.

11. Huang J, Li N, Xu H, Liu Y, An N, Cai Z. Global prevalence, risk factors, and reporting practice of needlestick and sharps injuries among dental students: a systematic review and meta-analysis. *J Hosp Infect.* 2022 Jul 1;129:89-101. doi:10.1016/j.jhin.2022.06.015.
12. Janjua SS, Hanan A, Sarwar H, Afzal M, Ali A. Awareness in nursing students regarding prevention of needle stick injuries. *Nursesearcher J Nurs Midwifery Sci.* 2022 Jun 30;2(1). doi:10.54393/nrs.v2i01.30.
13. Ledinski Fičko S, Mlinar M, Hošnjak AM, Smrekar M, Kurtović B, Babić J. Nursing student's knowledge about understanding and prevention of needle stick injury. *Croat Nurs J.* 2020 Mar 30;4(1):73-80. doi:10.24141/2/4/1/6.
14. Reference (Vancouver style): Palloş A, Demirca K, Özkan S. Evaluation of needlestick and sharp injuries, contributing factors, and preventive measures among nursing students. *CURARE J Nurs.* 2024 Oct 23;6:21-29. doi:10.26650/CURARE.2024.1570121.
15. Bagnasco A, Zanini M, Catania G, Watson R, Hayter M, Dasso N, Dini G, Agodi A, Pasquarella C, Zotti CM, Durando P, Sasso L. Predicting needlestick and sharps injuries in nursing students: development of the SNNIP scale. *Nursing Open.* 2020 May 21;7(5):1578-87. doi:10.1002/nop2.540.
16. Almuslami OK, Fadul SS, Munshi SS, Sangoof FM, Mersal NA. Awareness and prevalence of needle stick injury among nursing students at King Abdulaziz University. *Evid Based Nurs Res.* 2022 Aug 21;5(1):14-23. doi:10.47104/ebnrojs3.v5i1.266.
17. Al Qadire M, Ballad CAC, Al Omari O, Aldiabat KM, Abu Shindi Y, Khalaf A. Prevalence, student nurses' knowledge and practices of needle stick injuries during clinical training: a cross-sectional survey. *BMC Nurs.* 2021 May 21;20:187. doi:10.1186/s12912-021-00711-2
18. Xu X, Yin Y, Wang H, Wang F. Prevalence of needle-stick injury among nursing students: a systematic review and meta-analysis. *Front Public Health.* 2022 Aug 15;10:937887. doi:10.3389/fpubh.2022.937887.
19. Ali M, Bibi A, Khan J, Arshad S, Durdana M, Musafir Y. Student nurses knowledge of needle stick injuries at a private institute, Karachi. *Pakistan Journal of Health Sciences.* 2023;4(4). doi:10.54393/pjhs.v4i04.662
20. Khadka S, Parajuli S, Tiwari S. Knowledge regarding Needle Stick Injury among Nursing Students of Selected Nursing Colleges in Pokhara. *Journal of Birgunj Nursing Campus.* 2024 Dec 28;2(1):77-83.
21. Mohammed SA, Mahmood NA. Needlestick and Sharp Injuries Among Nurses in Kirkuk City Hospitals: Prevalence and Contributing Factors. *Journal of Pioneering Medical Sciences.* 2025 Sep 5;14:33-9.
22. Khan M, Ali S, Siddiq A, Fida S, Ahmad G, Malik M. Prevalence and prevention of needle stick injuries among nurses in tertiary care hospitals of Peshawar, Pakistan. *Journal of Surgery and Medical Case Reports.* 2025;2(4):054. doi:10.64142/jsmcr.2.4.48.
23. 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 30:79-83.