

Awareness and Prevalence of Needle Stick Injury among Nursing Students at King Abdulaziz University

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ABSTRACT

Context: Nurses and other health care workers, and at the same time nursing students in clinical training, are at high risk for needle stick injury. The main problem is that needle stick injury (NSIs) can lead to an increase in the risk of over 20 types of infection transmission among health care workers (HCWs), and the most dangerous infections are hepatitis C virus (HCV), hepatitis B virus (HBV), and human immunodeficiency virus (HIV).

Aim: This study aimed to explore awareness and assess the prevalence of needle stick injury among nursing students at King Abdulaziz University, KSA.

Methods: A cross-sectional study was conducted among a convenience sample of 217 nursing students at King Abdulaziz University. A pretested, structured self-administered questionnaire was used for data collection.

Results: Most of the students (92.6%) were aware that it is necessary to report the needlestick injury, 90.8% thought that there was a chance of getting an infectious disease from a needle stick, and 47.9% knew that all HIV, Hepatitis B, and Hepatitis C are of these infections. About one-third of students (32.3%) knew that the most common cause of needle stick injury was recapping the needle. For students' practice, 91.2% and 74.2% wore protective gear while handling sharp instruments and did not recap the needle after use. The mean knowledge and practice scores were 9.43 ± 2.96 and 1.65 ± 0.52 , respectively. The prevalence of needle stick injuries among nursing students was 14.7%.

Conclusion: The study concludes that a good awareness level of nursing students regarding needle stick injuries. This data emphasizes the importance of increased awareness, training, and education of nursing students for preventing needlestick injuries and reporting the incidence.

Keywords: Needle stick injury, awareness, prevalence, nursing students

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1. Introduction

Nurses and other health care workers, and at the same time nursing students in clinical training, are at high risk for needle stick injury. Needles stick injuries represent an occupational hazard for millions of healthcare workers. In a report by the *Centers for Disease Control and Prevention* (2019), an estimated 600,000 to one million needle stick injuries happen annually worldwide. In other studies, two-thirds of healthcare workers in hospitals were injured by sharp or needle sticks (Abebe et al., 2018).

In other studies, two-thirds of the healthcare workers were injured by sharp or needle sticks. Furthermore, studies from Addis Ababa, Arba Minch, Bahir Dar, and Awi Zone found that 66.6%, 42.1%, 18.7%, and 31.0%, respectively, of HCWs were exposed to needle stick and sharp injuries

(Feleke, 2013; Kelebore et al., 2016; Walle, 2013; Dilie, 2017).

It is estimated that around three million needle stick injuries occur globally each year, while the world health organization (WHO) stated that of the 35 million healthcare workers, 2 million experience percutaneous exposure to infectious diseases each year. 37.6% of Hepatitis B, 39% of Hepatitis C, and 4.4% of HIV/AIDS in healthcare workers worldwide are due to needle stick injuries (WHO, 2002).

Needle stick injuries play a major role in transmitting serious pathogens born to blood among healthcare workers (Alfulayw et al., 2021). A single accident could be sufficient to cause a serious infection (CDC, 2019). While the universal guidelines, as mentioned by King and Strony (2023), have reduced the risk of needlestick injuries over the last 30 years, these injuries continue to occur at a much lower rate.

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Healthcare professionals at the highest risk for needlestick injuries are surgeons, ER workers, laboratory professionals, and nurses.

The use of needles is inevitable in healthcare. However, every hospital has guidelines for properly handling and disposing of needles, and with the latest design of safety-conscious needles, needlestick injuries continue to occur. In most cases, needlestick injuries occur chiefly because of unsafe practices and gross negligence on the part of healthcare workers (King & Strony, 2023).

In the past, most needlestick injuries occurred when the needle was re-sheathed after blood was taken from the patient. Although this practice is no longer recommended. This practice is more concerning when healthcare workers ignore policies and discard needles directly into plastic bags instead of sharp containers (Nirmala & Suni, 2019). Factors that increase the risk of body fluid exposure are failure to take universal precautions, not following the provisions of the safety protocol, high-risk procedures that increase the risk of blood exposure, such as withdrawal of blood, working in the dialysis unit, administration of blood, use of needles and other sharp devices that lack safety features (King & Strony, 2023).

Many healthcare institutions have now adopted unique ways to prevent such injuries. There are now established protocols in the operating room on how the nurse will pass the equipment and needles to the surgeon and vice versa. Double gloves are another method of avoiding needlestick injuries (Fičko et al., 2020).

2. Significance of the study

Needle stick injuries (NSIs) increase the risk of over 20 infectious diseases among HCWs, including hepatitis B, hepatitis C, and HIV. According to the *Centers for Disease Control and Prevention (CDC) (2019)*. NSIs usually occur when using diagnostic or therapeutic procedures; the most common incidents occur with previously used needles (Hada et al., 2018).

A study was done in the Al-jouf region to determine knowledge and prevalence of needle stick injuries among nurses working in hemodialysis units. The study revealed that the knowledge of hemodialysis nurses in the Al-jouf region about the risks associated with needlestick injuries and the use of preventive measures was inadequate. NSI prevalence showed that almost two-thirds of the nurses (68%) suffered at least one NSI in the past three months. This finding is considered a significant finding indicating concerns regarding the magnitude of the problem (Tawil, 2016).

A recent retrospective study done in 2020 revealed that the proportion of needle sticks and sharp injuries (NSSIs) was highest among nurses and cleaners compared to physicians, other workers, and lab technicians (Saadeh, 2020). Needle stick injuries are among healthcare workers' most important occupational injuries. Any punctures caused by a contaminated sharp object such as a needle, ampoule, or scalpel can lead to infection transmission. More than 20 pathogens that can transmit infection have been registered, and the most dangerous infections are hepatitis C virus

(HCV), hepatitis B virus (HBV), the human immunodeficiency virus (HIV), and, more rarely, malaria, human T cell leukemia virus, and Ebola. A needle stick injury is a major health hazard that can also cause considerable stress to nurses, nursing students, and their families. As well as the emotional distress associated with NSI, it is one of the biggest concerns from a healthcare professional's perspective, and the totality of its burden, including legal compensation and absenteeism. Thus, the current study explored the awareness and prevalence of needle stick injury among nursing students at King Abdulaziz University, KSA.

3. Aim of the study

This study aimed to explore awareness and assess the prevalence of needle stick injury among nursing students at King Abdulaziz University, KSA.

3.1. Research Questions

- What is the level of awareness of nursing students regarding needle stick injury at King Abdulaziz University?
- What is the prevalence of needle stick injury among nursing students at King Abdulaziz University?

4. Subjects and Methods

4.1. Research design

A cross-sectional study design was used. Cross-sectional studies are used both descriptively and analytically. Descriptive cross-sectional studies characterize the prevalence of a health outcome in a specified population. The study variables were needle stick injury prevalence and awareness of nursing students.

4.2. Research setting

The study was done in the Faculty of Nursing, King Abdulaziz University, Jeddah, Kingdom of Saudi Arabia. The faculty of nursing is established in 1433 H. The nursing curriculum was and still is a four-year academic program followed by a one-year internship program.

4.3. Subjects

A convenience sample of 217 nursing students was included in the study by a non-probability convenience sampling method, according to the availability and accessibility of the data. The inclusion criteria were nursing students of both genders who were studying in any academic grade and willing to participate.

4.4. Tools of the study

4.4.1. Structured Interview Questionnaire

The researcher develops this questionnaire to collect data regarding the student sociodemographic characteristics and nursing students' awareness regarding NSIs. Questions were categorized into four sections. The first section included demographic data about gender, the academic year, and attending educational training. The second section aimed to assess the prevalence of NSIs. It has been measured by

statistical analysis. It consists of two questions about previous exposure and reporting a needle stick injury.

The third section included eight questions to assess students' awareness regarding risks related to needle stick injury; for example, is it necessary to report the NSI, do you think there is a chance of getting an infectious disease from NSI, and what causes of NSIs.

The fourth section aimed to assess the student practice regarding NSI. It included two questions regarding the student's reported practice that measured awareness regarding wearing gloves/protective gear while handling sharp instruments and recapping the needle after use.

Scoring system

For every right chosen answer for awareness and right practice, a score of "1" was given, leaving a score of 14 (because some questions have more than one correct answer) for the awareness section and a score of "2" for the practice section. Students who had 50% of the total awareness score were classified as having poor awareness, who had 50%-75% of the total score were classified as having fair awareness, and those who got 75% and more of the total awareness score were classified as having good awareness.

4.5. Procedures

Validity: The researcher developed the tool after extensively reviewing relevant literature. The content of the constructed tool was revised by a jury of 5 experts in the field of Medical Surgical Nursing, Nursing leadership and Management, Maternal and Child Health Nursing, and Critical Care Nursing Departments, Faculty of Nursing at King Abdul Aziz University to test the content validity, completeness, and clarity of items. Comments and suggestions of the jury were considered, and the tool was modified accordingly. The reliability of the developed tools was tested using the Cronbach alpha test (0.81).

Ethical considerations: Ethical approval for the study was obtained from the Scientific Research Ethics Committee of the Faculty of Nursing, King Abdulaziz University, KSA. The participants' consent for participation was required by asking them at the beginning of the survey after explaining the study's aim. A letter to the dean to obtain consent for data collection is provided and approved.

Pilot study: Data was collected using the online version in English from on 10% of the study sample (22 nursing students) from the faculty of nursing at KAU to examine the feasibility of the study and applicability of the study tool of data collection. By sending a link to the students (<https://forms.gle/wQ6UoxuDfQ2CTood8>). It took two days to complete. Then modification was done, and the number of students included in the pilot study was excluded from the study sample. The link was sent to all students' groups. The answered questionnaires were analyzed. Time of data collection from 22/01/2021 to 10/04/2021. The students participating in the study were of both genders and from all grade levels.

4.6. Limitations of the study

The limitations were the inability to generalize the survey results to the population because we took a

convenient sample. Also, the sample size we took was constructed only for the nursing students from King Abdulaziz University only colleges in KSA. In particular, the nature of the self-report survey is one of the main constraints of this study.

4.7. Data analysis

Statistical analysis was conducted by SPSS Statistical Package for Social Science, version 25. Percentages and frequencies were used to summarize qualitative data, and the Chi-squared test (χ^2) was applied to test the relationship between variables. Mean and standard deviation (mean \pm SD) were used to summarize quantitative data. Spearman correlation was used to detect the relationship between variables. The significance threshold was set at a p-value of ≤ 0.05 .

5. Result

Table 1 shows that 41.9% of students were in the fourth academic year, and 86.6% were females. Of them, only 24% had attended educational training about needle stick injury, and most of this training was in the KAU faculty of nursing generally and the 2nd year especially.

Figure 1 illustrates that 14.7% of students had previous exposure to needle stick injury; of them, 62.5% reported the incident to the head of the department.

Table 2 shows that 92.6% of students were aware that it is necessary to report a needlestick injury, 90.8% thought there was a chance of getting an infectious disease from a needle stick, and 47.9% of them knew that all HIV and Hepatitis B, and Hepatitis C are of these infections. About one-third of students (32.3%) knew that the most common cause of needle stick injury was recapping the needle. Also, 71.9% and 24.4% are aware that after a needle stick, one should get tested as soon as possible or within 4-6 months after exposure, respectively.

Almost half of the students (46.1%) knew that tests should be done after a needle stick were all tests, HIV, Hepatitis B tests, and Hepatitis C tests. Besides, 92.2% thought hepatitis B vaccination was necessary for all students. 94% and 56.7% are aware that sharps disposal containers used immediately after injection can reduce the risk of needle stick injury and washing the wound with soap and water is effective after a needle stick injury, respectively. The mean total knowledge and practice scores were 9.43 ± 2.96 .

Table 3 shows students nurses' practice regarding NSI; 91.2% and 74.2% were wearing gloves/protective gear while handling sharp instruments and were not recapping the needle after using, respectively. The mean total practice scores were 1.65 ± 0.52 .

Table 4 shows the relation between the level of students' awareness and their academic grade, gender, practice, and attending educational training. The table shows a significant relationship between students' grades and awareness levels. The students in the fourth grade showed the best awareness levels; 45.1% and 53.8% showed good and fair awareness, respectively. The table also shows a significant gender awareness difference as females showed a better awareness

level of 44.1%, and 48.9% had a good and fair awareness level. Those who were wearing gloves/protective equipment while handling sharp instruments, 44.4%, and 47.5% had better awareness levels (good and fair, respectively). Also, those who recapped the needle after using 49.1% and 44.1% showed good and fair practice levels, respectively. Besides,

student nurses who attended education training had higher knowledge (good knowledge among 63.5%)

Figure 2 reveals a significant positive correlation between knowledge and practice scores ($r= 0.19$, $p\text{-value}= 0.006$).

Table (1): Frequency and percentage distribution of student nurses' demographic characteristics (n=217).

Variables	Frequency	Percentage
Academic grade		
Second year	77	35.5
Third year	49	22.6
Fourth-year	91	41.9
Gender		
Female	188	86.6
Male	29	13.4
Attending educational training about needle stick injury		
No	165	76
Yes	52	24
If yes, please specify the following:		
At KAU faculty of nursing	15	6.9
2nd year in a microbiology course	1	0.5
At KAU faculty of nursing in 2nd year	12	5.5
At KAU faculty of nursing in labs	1	0.5
At KAU faculty of nursing surgery course	1	0.5
At the Simulation Center	3	1.4
With MOH workshop	3	1.4
Not specified	17	7.9

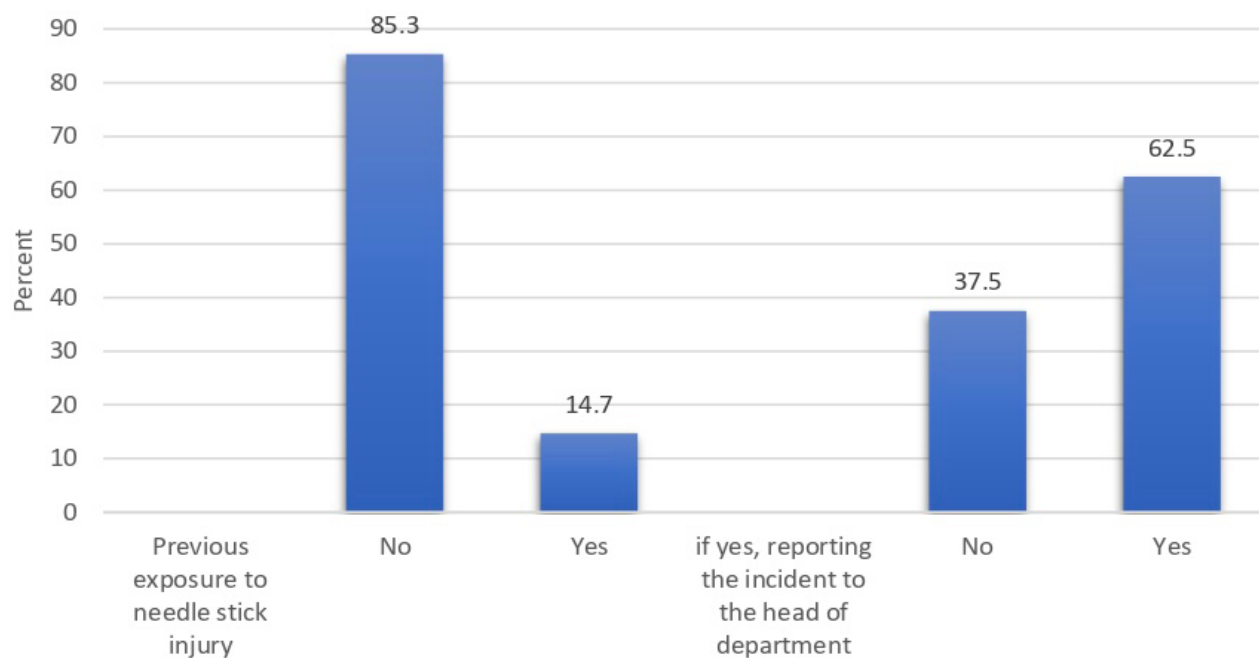


Figure (1): Percentage distribution of the participants according to their previous exposure to needle stick injury.

Table (2): Frequency and percentage distribution of student nurses' awareness about needle stick injury (n= 217).

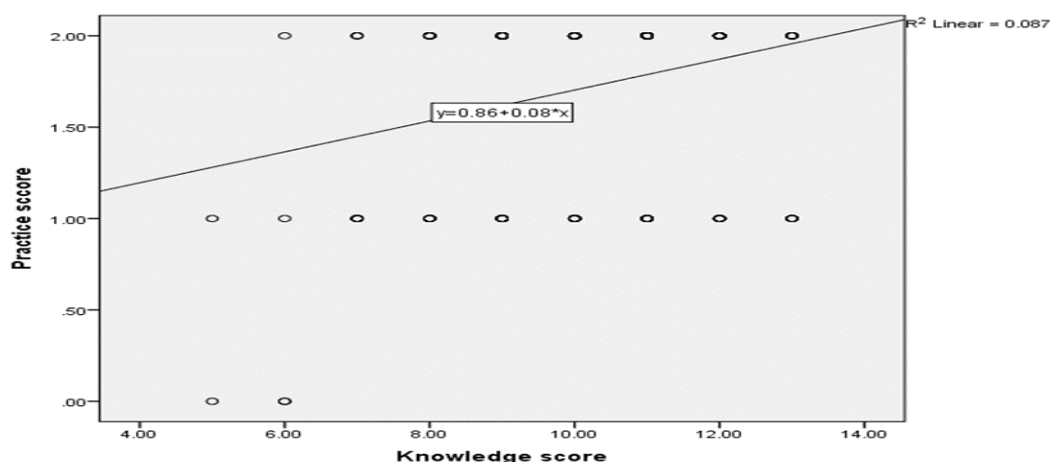
Variables	Frequency	Percentage
Is it necessary to report a needlestick injury?		
No	16	7.4
Yes (correct answer)	201	92.6
Do you think there is a chance of getting an infectious disease from a needle stick?		
No	20	9.2
Yes (correct answer)	197	90.8
If yes, What kind of diseases? (All are correct)		
Hepatitis B	7	3.2
Hepatitis B, Hepatitis C	4	1.8
Hepatitis C	3	1.4
HIV	15	6.9
HIV, Hepatitis B	52	24
HIV, Hepatitis B, Hepatitis C	104	47.9
HIV, Hepatitis C	12	5.5
Which of the following is the most common cause of needle stick injury?		
During disposal of the needle	12	5.5
During suturing procedures	9	4.1
During suturing procedures and disposal of the needle	5	2.3
Recapping the needle (correct answer)	70	32.3
Recapping the needle and during disposal of the needle	63	29
Recapping the needle and during suturing procedures	28	12.9
Recapping the needle during suturing procedures and disposal of the needle	30	13.8
How long after a needle stick should you get tested?		
One year after exposure	8	3.7
4-6 months after exposure	53	24.4
As soon as possible (correct answer)	156	71.9
What tests are done after a needle stick? (All are correct)		
HBV	21	9.7
HCV	6	2.8
HBV, HCV	6	2.8
AIDS	20	9.2
AIDS, HBV	56	25.8
AIDS, HCV	8	3.7
All tests (AIDS, HBV, HCV)	100	46.1
Do you think hepatitis B vaccination is necessary for all students?		
No	17	7.8
Yes (correct answer)	200	92.2
Can sharps disposal containers used immediately after injection reduce the risk of needle stick injury?		
No	13	6
Yes (correct answer)	204	94
After a needle stick injury, is washing the wound with soap and water effective?		
No	94	43.3
Yes (correct answer)	123	56.7
Mean Knowledge score		9.43±2.96

Table (3): Frequency and percentage distribution of student nurses' Practices about NSI (n= 217).

Variables	Frequency	Percentage
Do you wear gloves/protective gear while handling sharp instruments?		
No	19	8.8
Yes (correct practice)	198	91.2
Do you recap the needle after using it?		
No (correct practice)	161	74.2
Yes	56	25.8
Mean total practice score	1.65 ± 0.52	

Table (4): Relation between students' awareness level about needle stick injury and their academic year, gender, and practice (n=217).

Variables	Awareness level						χ^2	p-value
	Poor		Fair		Good			
	No.	%	No.	%	No.	%		
Academic grade								
Second year	21	27.3	23	29.9	33	42.9	32.39	< 0.001
Third year	3	6.1	25	51	21	42.9		
Fourth-year	1	1.1	49	53.8	41	45.1		
Gender								
Female	13	6.9	92	48.9	83	44.1	31.59	< 0.001
Male	12	41.4	5	17.2	12	41.4		
Do you use gloves or other protective equipment while using sharp instruments?								
No	9	47.4	3	15.8	7	36.8	27.34	< 0.001
Yes (correct practice)	16	8.1	94	47.5	88	44.4		
Do you recap the needle after using it?								
No (correct practice)	14	25	26	46.4	16	28.6	15.94	< 0.001
Yes	11	6.8	71	44.1	79	49.1		
Attending educational training about needle stick injury?								
Yes	21	9.6	58	26.9	138	63.5	11.1	0.004
No	26	12.1	109	50.3	82	37.6		



N.B.: ($r = 0.19$, $p\text{-value} = 0.006$)

Figure (2): Spearman's correlation analysis between knowledge and practice scores.

6. Discussion

Needles stick injuries represent an occupational hazard for millions of healthcare workers. It usually occurs when using diagnostic or therapeutic procedures with previously used needles. At the same time, the current study explored awareness and assessed the prevalence of needle stick injury among nursing students at King Abdulaziz University, KSA.

The study reveals that nearly half of the students were in the fourth academic grade. This result is in line with *Suliman et al. (2018)*, who stated that almost half of the students were in the fourth academic year. In contrast, this result contradicts *Jelly et al. (2015)* in a study entitled "The occurrence and knowledge about needle stick injury among nursing students." They highlighted that almost half of the students were in the third academic year.

Regarding gender, most of the students were females. This finding might be due to nursing education for males being started recently. This result agrees with *Suliman et al. (2018)*, who mentioned that more than half of the studied nurses were females.

The current study reports that almost a quarter had attended educational training about needle stick injury. Most of this training was in the KAU Faculty of Nursing generally and the second year especially. The reason is that most nursing students start their training at the hospital in the second year, so the college focuses on increasing their awareness regarding the hospital environment. *Yang et al. (2007)*, in a study titled "The effectiveness of a training program on reducing needlestick injuries/sharp object injuries among soon graduate vocational nursing school students in Southern Taiwan," mentioned that after educational intervention, the incidence of NSIs/SIs decreased significantly from 50.5% pretest to 25.2% post-test.

The present study reveals that the student nurses who experienced needle stick injuries in this study more than one-tenth. The highest percentage of them reported the NSI to the head of the department. This finding is an indicator of the nursing students' fair awareness. Results of another study showed that the student's incidents of exposure to NSI are less than they have. Furthermore, three-quarters of students who had suffered NSI did not inform their clinical instructors in a study entitled "Evaluations of stress level caused by fear of exposure to needle stick injury among nurses" (*Ali & Mohamed, 2018*).

Several other studies have shown a high occurrence of needle stick injuries among nursing students. In a study conducted in Hodeidah governorate, Yemen, three-quarters of the sample of the HCWs providing injections in the hospitals reported that a used needle had pricked them during work a study titled "Unsafe injection practices in Hodeidah governorate" (*Abkar, 2013*). Another study conducted in Pakistan in tertiary care hospitals reported that two third of a sample of the nurses were exposed to at least one needle stick injury during their career in a study entitled "Needle stick injuries–risk and preventive factors: A study among health care workers in tertiary care hospitals in Pakistan" (*Afridi et al., 2013*).

A study conducted in Egypt by *Hanafi (2011)* entitled "Needlestick injuries among health care workers of University of Alexandria Hospitals." The study indicated that around three-quarters of nurses had suffered at least one needle stick injury in the last 12 months. Also, a study conducted in India by *Muralidhar et al. (2010)* entitled "Needle stick injuries among health care workers in a tertiary care hospital of India" and conducted in a tertiary care hospital. They found that three-quarters of nurses were exposed to needlestick injuries in their careers.

This result contradicts a study entitled "Needlestick injuries among nursing students" (*Wan-Xia, 2010*), which mentioned that a total of 1144 incidents of needlestick injuries were reported among the 246 nursing students during the time of the internship. The overall rate of needlestick injuries among these nurses was 100%. At the same time, this result contradicts another study by *Smith and Legga (2005)*, entitled "Needlestick and sharps injuries among nursing students, which emphasized that needlestick injuries were not reported and the main reason for non-reporting was that the item was unused on a patient prior needlestick injury.

Another indicator of fair awareness, the findings of the present study reveal that most of the students were aware of the necessity of reporting the NSIs, NSIs had the chance of getting an infectious disease, testing after NSI, the necessity of vaccination against HBV, and the immediate use of sharp container can reduce the incidence of NSI. More than half of them know that washing the wound with soap and water is effective after NSI. Around one-third of them correctly answered the question of the possible cause of NSI, the test that should be done after NSI.

This result agrees with another study entitled "Investigating needle stick injuries, incidence, knowledge, and perception among South Jordanian nursing students" (*Nawafleh et al., 2018*), which mentioned that the majority of the study sample of all students agreed that poor handling of sharp materials leads to infection and referred to the possibility of HBV that travels through the needlestick, the majority of the studied respondents replied that this virus is transmitted through needlestick indicating that a large percentage of nursing students accept this fact. Regarding HIV transmission through needlestick, most of the studied respondents answered positively.

While this result contradicts another study entitled "Needlestick and sharps injuries among nursing students," *Smith and Leggat (2005)* emphasized that opening the needle cap was the most causative event. Since less than half of the students know that all tests should be done, it is recommended that the training program should be mandatory for student nurses before graduation to protect themselves from infection.

Also, the current study results reveal that most nursing students realize the chance of getting an infection from NSI and the necessity of Hepatitis B vaccination for nursing students. These findings agree with another study entitled "Investigating needle stick injuries: Incidence, knowledge, and perception among South Jordanian nursing students" (*Nawafleh et al. (2018)*), which stated that most student nurses

thought that hepatitis B vaccination is necessary for every student.

The current study reveals that most student nurses answered correctly that sharp disposal containers used immediately after injections could reduce the risk of NSI. This result reflects a fair student awareness and agrees with the study of *El-hazmi (2008)* entitled "Needle stick and sharps injuries among health care workers: Biomedical Research," which emphasizes that a minority of the study sample do not use sharps disposal containers immediately after injection.

The current study reveals a fair total mean score of awareness that reflects good preparation of students in basic nursing in the second year. These study findings contradict the results of *Shanthibala (2018)*, who reported that only a quarter of the nurses had adequate awareness. However, it is compatible with the results obtained from previous studies. A study conducted in Southeast Nigeria in tertiary health institutions revealed that most nurses had a good awareness of a study entitled "Knowledge and practice of universal precautions against blood-borne pathogens amongst house officers and nurses in tertiary health institutions in Southeast Nigeria" (*Adinma, 2009*).

In contrast to the present study findings, a study entitled "Needle stick injuries among health care workers in AL-Madinah AL-Munawara Governmental Hospitals in Saudi Arabia" (*Albeladi et al., 2021*). The study emphasized that more than half of the study sample thought squeezing the affected part and cleaning it with disinfectant was the most effective. This result agrees with the study "Needle stick injuries and their related safety measures among nurses in a university hospital, Mehdi" (*Jahangiri et al. 2016*), which stated that approximately three-quarters of the study sample reports washing the wound with soap and water are effective.

As for student practice, the present study revealed that most of the study sample wore gloves/protective gear while handling sharp instruments. This result is compatible with their fair awareness level evidenced in this study. In line with this finding, *Elsherbey and Niazy (2018)* mentioned that most student nurses use protective equipment (gloves) when handling sharp instruments and during procedures. While this result contradicted *Norsayani (2003)*, who emphasized that three-quarters of students thought wearing gloves were of no benefit, as the needle would penetrate the glove.

In addition, for students' practice. The present study reveals that around three-quarters of students were not recapping the needle after using it because students were trained in college not to recap the needle. This result agrees with *Suliman et al. (2018)*, who stated that more than half of the sample did not recap the syringe after performing nursing interventions.

The current study also reveals a statistically significant relationship between the level of student nurses' awareness and their academic grades, gender, commitment to using gloves and needle recapping, and attending educational training. As the elder students were more aware of NSI, it might be due to their experience throughout the different academic grades. Those who had a correct reported practice also had fair knowledge, which was evidenced by the

significant positive relationship between student knowledge and practice. The study also reveals an association between attending educational training and good awareness. These study findings were similar to *Nasir & Al-Khaidi (2022)*, who reported a significant positive relationship between knowledge and practice in a study entitled "Knowledge, Attitude, and Practice Regarding Needle Stick Injuries Among Health Care Workers in Baghdad Teaching Hospital and Ghazy Al-Hariri Hospital for Surgical Specialties in 2020."

7. Conclusion

In light of the current study, it can be concluded that: the study reveals a low prevalence rate (14.7%) of needle stick injuries among nursing students and a good level of awareness.

8. Recommendations

- Students should receive ongoing instruction about the need to follow conventional infection control precautions and be fully educated on safe needles use and disposal.
- Nursing students should be educated about the dangers of blood-borne pathogen transmission and how to avoid it.
- Instructions for nursing students should be reiterated regularly, and clinical supervision should be handled to guarantee compliance in all clinical encounters involving NSIs.

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