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Knowledge, Attitudes, and Practices Concerning Needle-Stick Injuries Among Healthcare Workers: A Cross-Sectional Study at Khyber Teaching Hospital, Peshawar

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Article Details

ABSTRACT

Keywords: NSI, Health Care Workers, KTH

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INTRODUCTION: The introduction of bloods or others potentially hazardous materials by a hollow needle or other sharps instrument such as needle, surgical blades, contaminated broken glass etc. into the body of healthcare providers, during the performance of their duty is known as Needle Stick Injuries. NSI are the main risk factor for most common blood borne diseases such as human immunodeficiency virus, hepatitis c virus, and hepatitis B virus. The aim of the current study was to assess knowledge attitude and Practices among healthcare workers regarding needle stick injuries at Khyber teaching hospital Peshawar, Pakistan.

METHODS: A cross-sectional study was conducted among healthcare workers. A structured pre-tested questionnaire was administered in a total of 150 healthcare workers to fill the questionnaire during the months of March and April 2025. SPSS 27.0 was used for data analysis. Percentages of the categorical variables were computed and compared by Chi square test at a 5% level of significance.

RESULTS: In our study a total of 150 health care workers were observed. They included 55 males and 95 females. Among these health care workers 129 were those who got Needle Stick Injury during their hospital hours with 86% ratio and 21 were those who didn't get the Needle Stick Injury during their practical experience with 14% ratio. Only 54.7% were familiar with the definition of NSI. Rests of them were not exactly familiar to the NSI. Only 62.7% HEALTH CARE WORKERS were familiar that all the three HBV, HCV, HIV are common blood borne pathogens to which they are more likely exposed to during practical work. Rests of them were not exactly familiar with this.

CONCLUSION: Most healthcare workers got needle stuck injuries, despite knowing of risk, frequency was high due to burden and inadequate protective measures. There is need to provide adequate protective equipment, proper training for needle stick injuries and post exposure prophylaxis to all healthcare workers.

INTRODUCTION:

The introduction of bloods or other potentially hazardous materials by a hollow needle or other sharps instrument such as needle, surgical blades, contaminated broken glass etc. into the body of healthcare providers, during the performance of their duty, which are the risk of most common blood borne diseases such as human immunodeficiency virus (HIV), hepatitis c virus (HCV), and hepatitis B virus (HBV) is known Needle Stick Injuries⁽¹⁾.

NSIs mostly occur when healthcare providers exchange needles, recapping syringes, tie off sutures, overload of sharp containers, during cannulation and breaking of vials. Health care workers mostly dealing to a range of hazards during their duties, NSI has been recognized one of the biggest occupation hazard among Healthcare Workers.

Due to the recognized risk of needle-stick injuries, safeguards have been put in place to attempt to lessen the risk of injury which includes the policy of universal precautions and needleless systems to connect with intravenous tubing. Several strategies have been adopted for use in the healthcare setting, which includes double gloving, having a neutral zone in which to pass sharps, and the use of blunt tip needles. Wearing two pairs of gloves is a practice which protects healthcare workers from patients' blood and bodily fluids⁽⁸⁾.

Needle stick injuries is a serious issue, a common cause of blood borne diseases. Worldwide estimate that 33% of new cases of Hepatitis B, 42% of Hepatitis C and 2 % of HIV occurred due to unsafe injection practices (13). In Pakistan the frequency of needle stick injuries as high as 58% and the two major diseases Hepatitis B and C may be transmitted through affected needles, Hepatitis B transmission is 20-40% (13).

The above mentioned points obviously show the importance of this study to be conducted and the result will help to increase the awareness of safe needle practices. Hence the knowledge about causes and management of needle stick injuries among health care workers is expected to be the main goal of those dealing with needles and other sharps. There was little study available about needle stick injuries in Peshawar. Therefore the primary purpose of this study was to assess the knowledge and practice among health care workers regarding needle stick injuries at tertiary care hospital in Peshawar.

MATERIALS AND METHODS

This study was a cross-sectional study carried out at Khyber Teaching Hospital Peshawar, Pakistan. This study was carried out on 150 Health care workers, after obtaining their informed consent to participate. The questions were asked through a pre designed close ended questionnaire, which was ethically reviewed and approved by departmental research committee. No ethical issue or harm risk was involved in this study. This questionnaire was utilized to collect the data which contained close-ended questions consisting of 3 sections. Firstly the information section, in second and third sections, questions related to practice and knowledge regarding NSIs were asked. The practice related questions were categorized in 'yes' and 'no' response and knowledge related questions were with multiple choices.

The duration of the study was 4 months. March – April 2025. The sample size for the present study was calculated using the standard formula for estimating a population proportion in cross-sectional research. A confidence level of 95% was selected, corresponding to a Z-score of 1.96. In the absence of prior prevalence data, a population proportion of 50% was assumed, as this provides the maximum variability and ensures an adequate and conservative sample size. A margin of error of 8% was chosen, which is considered acceptable for descriptive studies conducted within limited time and resource constraints. Based on these parameters, the sample size was calculated using the sample size formula and substituting the values into the formula yielded a sample size of 150 participants. Accordingly, a total of 150 respondents were included in the study. Non probability convenient sampling technique was used. All Staff nurses, paramedical staff, 3rd & 4th year nursing students were included while administration staff, Doctors, 1st & 2nd year nursing students were excluded from the study. The statistical tool used for data analysis was SPSS version 27.0. Descriptive statistics was used for frequencies while Chi square test was used for gender wise frequencies. All the assumptions of

the tests were fulfilled in order to apply the tests for analysis.

RESULTS

The distribution of participants in our study across different professional categories shows a diverse representation. Out of the total 150 participants, students constituted the largest group, with 50 individuals (33.3%). Female nurses formed the second largest group, comprising 43 participants (28.7%), followed by male nurses, who accounted for 29 participants (19.3%). Technicians represented 28 participants, making up 18.7% of the total sample.

Table no 3.1: Ratios of health care workers participated

Category	Frequency (n)	Percentage (%)
Male Nurses	29	19.3
Female Nurses	43	28.7
Students	50	33.3
Technicians	28	18.7
Total	150	100.0

Table no 3.1: Ratios of health care workers participated

Distribution of Needle Stick Injury (NSI) by Designation

The response rate were 100% all the participants actively participated. Among these health care workers 129 were those who got the Needle Stick Injury with 86% ratio (in which male nurses with the ratio of 69%, female nurses with the ratio of 72.1%, students with the ratio of 100% and technicians with the ratio of 100%) and 21 were those who didn't got the NSI during their practical experience with 14% ratio. According to the survey the major cause of getting NSI was the "recapping" of the syringes with the ratio of 42.3% , second was the "breaking of ampule" with the ratio of 33.8% ,the "cannulation" was the third major cause with the ratio of 13.8% and the administering of injection with the ratio of 10.0% on fourth one . Among health care workers the 63.3% were those who use to wear gloves before performing any procedure while 36.0% health care workers do not wear gloves before performing any procedure. Results showed that the majority of them were not recapping the needle having the ratio of 32.7%. The 30.0% of them were recapping using both hands without tongs or forceps. Only 22.7% of them were recapping with "one hand method" the recommended method. The causes of getting NSIs ,the major cause is the "lack of protective measures" with 41.1% ratio. The second major cause was the "heavy workload" with ratio of 33.6%. Total 129 cases were there about getting injury but only 41.9% of them have reported about the injury while 57.4% injuries are not reported to the head or the concerned ones. Only 54.7% were familiar about the definition of NSI. Rests of them were not exactly familiar to the NSI. 62.7% HEALTH CARE WORKERS were familiar that all the three HB Virus, HC Virus and HI virus are the common blood borne viruses to which they are more likely exposed to, during practical work. Rests of them were not exactly familiar to this. The 33.6 % of them (who got the injury) got the pretest counseling after the exposure to the NSI. While 66.4% didn't got the pretest counseling after the exposure to the NSI.

Table no 3.2 shows that total 150 health care workers were observed .They included 29 male nurse, 43 female nurse, 50 students and 28 technicians. Among these Health care workers 129 were those who got the needle stick injury with 86% ratio while 21 were those who didn't got the NSI during their practice experience with the ratio of 14% ratio. Tab no 3.2.

Table 3.2: Distribution of Needle Stick Injury (NSI) by Designation (N = 150)

Designation	Yes, n (%)	No, n (%)	Total, n (%)
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Male Nurses	20 (69.0)	9 (31.0)	29 (100.0)
Female Nurses	31 (72.1)	12 (27.9)	43 (100.0)
Students	50 (100.0)	0 (0.0)	50 (100.0)
Technicians	28 (100.0)	0 (0.0)	28 (100.0)
Total	129 (86.0)	21 (14.0)	150 (100.0)

Distribution of Causes of Needle Stick Injury by Designation

According to the results the major cause of getting NSIs was the “recapping “ of the syringes with the ratio of 42.3% , second was the “breaking of ampule” with the ratio of 33.8% ,the “cannulation” was the third major cause with the ratio of 13.8% and the administering of injection with the ratio of 10.0% on fourth one table no 3.3.

Table 3.3: Distribution of Causes of Needle Stick Injury by Designation (N = 130)

Designation	Recapping Needle(%)	Breaking Ampoules(%)	Administering Injection (%)	During Cannulation(%)	Total (%)
Male Nurses	7 (35.0)	12 (60.0)	0 (0.0)	1 (5.0)	20 (100.0)
Female Nurses	18 (56.3)	10 (31.3)	1 (3.1)	3 (9.4)	32 (100.0)
Students	23 (46.0)	18 (36.0)	5 (10.0)	4 (8.0)	50 (100.0)
Technicians	7 (25.0)	4 (14.3)	7 (25.0)	10 (35.7)	28 (100.0)
Total	55 (42.3)	44 (33.8)	13 (10.0)	18 (13.8)	130 (100.0)

Practices, Knowledge, and Reporting Behavior Related to Needle Stick Injuries among Health Care Workers

The consolidated findings presented in Table below provide an overall picture of the practices, awareness, and reporting behavior of health care workers regarding needle stick injuries. With respect to routine safety practices, nearly two-thirds of the participants (63.3%) reported that they wear gloves before performing any procedure. However, a considerable proportion (36.7%) admitted that they do not consistently use gloves. When recapping practices were explored, a mixed pattern was observed. Although 32.7% of the respondents stated that they do not recap needles at all, which is considered a safer practice, only 22.7% reported using the recommended one-hand scoop method. Worryingly, 30.0% of the participants were recapping needles using both hands without the use of tongs or forceps.

Analysis of the causes of needle stick injuries revealed that the most frequently reported factor was the lack of protective measures (41.1%). This was followed by heavy workload (33.6%), suggesting that both system-level deficiencies and work pressure play a major role in the occurrence of such injuries. Smaller proportions of injuries were attributed to inattention or haste (13.7%) and other miscellaneous causes (11.6%). Regarding reporting behavior, the findings showed that less than half of the injured participants (41.9%) reported their needle stick injury to the concerned authorities, while a majority (57.4%) did not report the incident.

In terms of knowledge, just over half of the participants (54.7%) correctly identified needle stick injury as injuries caused by both needles and sharps. Although this reflects a moderate level of awareness, a substantial

proportion still lacked accurate understanding of the definition. Similarly, awareness of common blood-borne pathogens was not universal. While 62.7% correctly identified hepatitis B virus, hepatitis C virus, and human immunodeficiency virus as the major blood-borne pathogens to which health care workers are exposed, more than one-third of the participants were not fully aware of this risk. Finally, among those who sustained a needle stick injury, only 33.6% reported receiving pre-test counseling following exposure, whereas 66.4% did not receive any counseling.

Table 3.X: Summary of Needle Stick Injury (NSI)–Related Practices, Knowledge, and Reporting among Health Care Workers

Variable	Category / Response	Frequency (n)	Percentage	Total (N)
Wearing gloves before procedures	Yes	95	63.3	150
	No	55	36.7	
Recapping method used	One-hand scoop method	34	22.7	150
	Using tongs/forceps	22	14.7	
	Both hands without tongs	45	30.0	
	Do not recap	49	32.7	
Causes of NSI	Heavy workload	49	33.6	146
	Lack of protective measures	60	41.1	
	Inattention / haste	20	13.7	
	Others	17	11.6	
Reporting of NSI cases	Reported	54	41.9	129
	Not reported	74	57.4	
Correct knowledge of NSI definition	Needles and sharps	82	54.7	150
	Other / incorrect options	68	45.3	
Knowledge of common blood-borne pathogens	HBV, HCV & HIV	94	62.7	150
	Other / incorrect options	56	37.3	
Pre-test counselling after NSI	Received counselling	—	33.6	Injured only
	Did not receive counselling	—	66.4	

DISCUSSION

NSI are the main risk factor for most common blood borne diseases such as HIV, HBV & HCV. In the current study only 62.7% Healthcare workers were familiar that all the three (HCV, HBV and HIV) are common blood-borne pathogens which they are more likely exposed to, during their hospital duties. Our study found 129 cases of NSI, in which only 41.9% reported the injury while 57.4% had not reported to the head or concerned ones. This finding was somewhat better than the findings of the study by Taylor et al., 2011, 81% of participants were of opinion that NSI reporting is not useful. Similarly, results were seen in the study 29% of participants had experienced NSI but none had reported. A study shows that around 55% students had not

reported about NSI¹⁴ (Taylor et al., 2011) . These observations show that most of the Healthcare workers, including medical and nursing students, were unaware of the fact that each kind of NSI should be reported. In our study among Health care workers 36.0% do not wear gloves while dealing the patients, it is a highly risk for a HEALTH CARE WORKERS that not using personal protection while dealing patients. A study Kumar et al., 2012 showed that 28.2% of Health care workers were not using gloves while dealing with the patients(Kumar et al., 2012). Such type of malpractice may be observed due to heavy workload on Health care workers, stress, unawareness and increased number of patients especially in emergency department of a tertiary care hospital in Peshawar.

Our study showed that majority of Health care workers were not recapping the needles having the ratio of 32.7%. Among the others 30.0% were recapping the needles using both hands without tongs and forceps. And only 22.7% of them were recapping the needles with “one hand method” the recommended method. A study by Gnansounou 2019 has revealed that 10 %-25 % of needle stick injuries occur during recapping of needles after usage. Another study in 2003 has shown that only 66% of workers were aware of the Universal Precaution Guidelines (Gnansounou, 2019).

In the present study recapping of the needle syringes was the major cause of getting NSI as majority of the NSI occurred due to recapping of needles. A study by Balouchi et al., 2015 showed that 64% of Health care workers got needle stick injuries during needle recapping. The reason for the greater contribution of recapping needle syringes to the injury is that recapping of the syringes are most commonly practiced by Health care workers having the greatest contact with it (Balouchi et al., 2015).

In our study majority of the healthcare workers were not vaccinated against HBV. Mostly this is because of not availability of resources in underdeveloped countries. Similarly, other protective measures were not good enough in Hospital including in our study. Regular screening and immunization are important for all Health care workers, but it seems to be impossible in Pakistan due to less availability of resources.

Keeping in view the current situation of needle stick injuries in Khyber teaching hospitals, all hospitals and health care settings should be provided with all preventive skills and preventive instruments against blood borne diseases. Record keeping and reporting of needle stick and sharp injuries should be considered as an important part of the infectious control activity. Post-exposure prophylaxis and protective equipment’s should be provided by hospital management. Universal precautions and good practices should be an important part of the syllabuses for all Health care workers. Vaccination program should be mandatory for all Health care workers. There is need of Hospital infection control committee that can conduct regular trainings for universal precaution and post-exposure prophylaxis implementation. Also, there should be provision of Insurance for HEALTH CARE WORKERS suffering from NSI.

CONCLUSION

Our study on the knowledge and practices among healthcare workers with regards to NSI, revealed that though the health care workers had adequate knowledge on NSI but majority of them were unaware that it needs to be reported. These findings suggest the need for organizing a sensitizing session on the course of action to be taken following a NSI and updating Health care workers about the use and availability of personal protective equipment. Awareness regarding NSI can be further reiterated by displaying charts with the information related to steps to be followed in case of NSI.

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