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Assessment of knowledge and practice regarding prevention and management of needle stick injury among staff nurses in selected hospital, West Bengal

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Background: Healthcare workers (HCWs) are exposed to blood-borne infections by pathogens, such as HIV, and hepatitis B and C viruses, as they perform their clinical activities in the hospital. The activities associated with majority of needle stick injuries are administering injections, withdrawing blood, recapping needles, disposing off needles and handling trash. [1]
It further notes that 37.6% of hepatitis B, 39% of hepatitis C, and 4.4% of Human Immunodeficiency Virus (HIV)/AIDS among HCWs around the world are due to NSIs (WHO). [2] Knowledge and preventive practice is a necessity in prevention and control of needle stick injuries so that effective measures could be taken as required and thereby reduces cross contamination of diseases from patients to nurses and also from nurses to patients.
Materials and Methods: In this non-experimental descriptive survey research study conducted among 100 staff nurses at Howrah District Hospital, Howrah, West Bengal from 4/12/23 to 6/1/24 were selected by convenient sampling technique, semi - structured questionnaire for demographic variables and structured questionnaire on assessment of knowledge and structured observational checklist on assessment of practice regarding needle stick injury among staff nurses were used for data collection.
Results: The findings of the study revealed that majority (54%) staff nurses belonged to the age group 21-30 yrs. Majority (86%) staff nurses got in-service training. Only 9% staff nurses had Needle Stick Injury and among them 22.22% staff nurses not taken PEP medication. Majority of them had average knowledge and practice regarding prevention & management of needle stick injury. There was positive correlation exists between the knowledge score & practice score of staff nurses as the 'r' value (0.320) with a "t" value 3.344 at df (98), which was significant at 0.05 level of significance. There were statistically significant associations found between knowledge score with age, working experience, professional qualifications and in-service training at 0.05 level of significance. There were also statistically significant associations found between practice score with professional qualification at 0.05 level of significance.
Conclusion: In conclusion, among 100 Staff nurses nine (9) were exposure to needle stick injury last one year. Among them two Staff Nurses were not taken Post Exposure Prophylaxis (PEP) medication due to their ignorance. That is very serious matter. The exposure of Staff Nurses to needle stick injury and its underreported is still a prevalent issue.

Keywords: Knowledge, practice, prevention, management, Needle stick injury, staff nurse

Introduction

Needle stick injuries (NSI) are wounds caused by needles that accidentally puncture the skin, are truly an occupational hazard for medical personnel who work with hypodermic and other types of needles and could transmit many pathogens including bacteria and deadly blood borne viruses like HBV (Hepatitis B Virus), HCV (Hepatitis C Virus) and HIV (Human Immune deficiency Virus) [3]. NSI increasing day by day and globally approximately 2 million health care workers suffer from infection per year through this route [4]. Information on occupational exposure, prevalence of the disease and the factors related to it are required for the establishment of an effective infection control programme [5]. Nursing personnel form an important risk group for occupational exposure to needle stick injuries as they are directly involved in the patient care activities. So, the knowledge of nurses about the prevention and management of needle stick injuries and practicing standard precautions is troublesome. Keeping these points in mind, the researcher planned and conducted a study to assess knowledge and practice regarding prevention &management of needle stick injury among staff nurse and to address this important issue in healthcare settings.

Materials and Methods

This non-experimental descriptive survey research study conducted to assess knowledge and practice regarding prevention and management of Needle Stick Injury in Selected Hospital, West Bengal among 100 staff nurses at Howrah District Hospital, Howrah, West Bengal from 4/12/23 to 6/1/24.

Study Design: Non-experimental, descriptive survey research design.

Study Location: This study was conducted at Howrah District Hospital, Howrah, West Bengal.

Study Duration: From 4/12/23 to 6/1/24

Sample Size: 100 staff nurses

Sample size calculation: In the present study, the sample constituted of 100 staff nurses at Howrah District Hospital, Howrah, West Bengal. Appropriate sample size for the present study was determined by using following; $N=Z^2pq/e^2$(Z=confidence limit-1.96, p=prevalence rate q=1-p, e=allowable error=10%)
Tentative sample size = 89
Z= confidence limit (1.96), P = prevalence rate (61.4%) from previous study.
q=1-P (100-61.4) =37.6
n=1.96x1.96x61.4x37,6/100
d=9
n =89
For pilot study =10
For final study =100

Subjects and selection method: The study population was drawn by non-probability convenient sampling technique among 100 staff nurses at Howrah District Hospital, Howrah, West Bengal.

Inclusion criteria

- Qualified staff nurses with GNM diploma/BSc nursing.
- Staff nurses who are willing to participate in the study.
- Staff nurses who are available at the time of study.

Exclusion criteria

- Staff nurses who are in long absent.

Procedure methodology

After written informed consent, appropriate sitting arrangement was set for data collection at the corner of nursing station. After sample selection paper pencil test was taken to fill up Tool-I that is Semi-structured questionnaire was used for assessment of demographic characteristics of staff nurses. The questionnaire included socio-demographic characteristics such as age, working experience, Professional Qualification Inservice training, experience needle stick injury, take PEP medication after needle stick injury.
Tool-II Structured questionnaire on assessment of knowledge of staff nurses regarding prevention& management of needle stick injury. It consists of 25 items. Area, I Concept of needle stick injury composed 9 item, Area II Prevention of needle stick injury composed 8 item, Area III Management after needle stick injury composed 8 items. Each item consists with 4(four) option, one right answer and three wrong answers.
Tool-III Structured observational checklist on assessment of practice regarding needle stick injury among staff nurse. Observation checklist was made with the help of injection safety audit format of west Bengal. Total 24 steps consist Yes and No option, the score of 1(one) was given for Yes and 0 for No. For entire data collection procedure average time taken or each subject for completion of semi structured for back ground information 5 min for structure knowledge questioner about 20-25 min, for observation checklist 8-10 min. Collected data was recorded carefully.

Statistical analysis

Descriptive and inferential statistics were used for data analysis. To assess the demographic characteristics frequency and percentage was used. Frequency, percentage, mean and mean percentage was used for assessment of knowledge and practice of staff nurses regarding prevention & management of needle stick injury. Correlation Co-efficient was used for assessment of relationship between knowledge and practice of staff nurses regarding prevention & management of needle stick injury. Chi-square was performed to test association between knowledge and practice of staff nurses regarding prevention & management of needle stick injury with selected demographic variables.

Result

Table 1: Frequency and percentage distribution of demographic characteristics of staff nurses, n= 100

Demographic variables	Frequency (%)
Age in years	
21-30	54 (54%)
31-40	35 (35%)
41-50	7 (7%)
51-60	4 (4%)
Working experiences	
1-10	80 (80%)
11-20	10 (10%)
>20	10 (10%)
Professional qualifications	
GNM	77 (77%)
B.Sc.	15 (15%)
P. B. B. Sc	8 (8%)
Inservice Training on infection control and BMW	
Yes	86 (86%)
No	14 (14%)

Exposure of NSI	
Yes	9 (9%)
No	91 (91%)
PEP medication taken after needle stick injury (n=9)	
Yes	7(77.78%)
No	2(22.22%)

Data presented in Table 1 shows that majority (54%) staff nurses belonged to the age group 21-30 yrs. As for working experiences, majority (80%) staff nurses had an experience of 1-10 yrs. Most of the (77%) staff nurses were having professional qualification as GNM. Majority (86%) staff nurses got Inservice training on infection control and BMW. Majority 91(91%) staff nurses had no exposure of needle stick injury. It was observed that majority (77.78) were having pep medication after needle stick injury.

Table 2: Frequency and percentage distribution of knowledge of staff nurses regarding prevention & management of needle stick injury n= 100

Level of knowledge	Frequency (%)
Good (>Mean+1SD) (>20.06+2.44)	9 (9%)
Average (Mean±1SD) (20.06±2.44)	78 (78%)
Poor (>Mean-1SD) (>20.06-2.44)	13 (13%)

Table 2 shows that majority (78%) Staff nurse's knowledge regarding prevention and management of needle stick injury was average, (9%) staff nurse's knowledge was good and (13%) staff nurse's knowledge was poor.

Table 3: Area wise maximum possible score, mean, mean% score of knowledge of staff nurses regarding prevention & management of needle stick injury n=100

Area wise knowledge	Maximum possible score	Mean	Mean%	Rank
Area - I:				
Concept of needle stick injury	9	7.43	82.56	2
Area - II:				
Prevention of needle stick injury	8	6.75	84.38	1
Area - III:				
Management after needle stick injury	8	5.88	73.50	3

Table 3 shows that regarding area wise knowledge of staff nurses regarding prevention & management of needle stick injury, prevention of needle stick injury was first (84.38%) followed by concept of needle stick injury was first (82.56%), and management after needle stick injury (73.50%).

Table 4: Frequency and percentage distribution of practice score of staff nurses regarding prevention & management of needle stick injury n=100

Practice score	Frequency (%)
Good (>Mean+1SD) (>21.54+1.78)	24 (24%)
Average (Mean±1SD) (21.54±1.78)	61 (61%)
Poor (>Mean-1SD) (>21.54-1.78)	15 (15%)

Data presented in Table 4 shows that majority (61%) staff nurses practice score regarding prevention & management of needle stick injury was average, 24% staff nurses practice score was good and 15% staff nurses practice score was poor.

Table 5: Relationship between knowledge and practice of staff nurses regarding prevention & management of needle stick injury n= 100

Variables	Mean	SD	Correlation coefficient ('r')	t-value
Knowledge score of staff nurse	20.06	2.44	0.320	3.344
Existing practice score of staff	21.54	1.78		

't' (98) 1.984; Significant at $p<0.05$

The data presented in table 5 reveals that there was positive correlation exists between the knowledge score & practice score of staff nurses as the 'r' value (0.320) with a "t" value 3.344 at df (98), which was significant at 0.05 level of significance.

Table 6: Association between knowledge of staff nurses regarding prevention & management of needle stick injury and selected demographic variables n= 100

Variables	Knowledge score		Chi-square value	df	P-value
	≥Median	<Median			
Age in years					
≤31	23	34	3.968*	1	0.0464
>31	26	17			
Working experience					
≤10 years	35	45	4.412*	1	0.0356
>10 years	14	6			
Professional qualification					
GNM	42	35	4.119*	1	0.0423
Other than GNM	7	16			
Inservice training					
Yes	38	48	4.404*	1	0.0359
No	11	3			

$\chi^2(df_1)$ 3.841, *Significant at $p<0.05$

Table 6 shows that there were statistically significant associations found between knowledge score with age, working experience, professional qualifications and in-service training at 0.05 level of significance.

Table 7: Association between practice score of staff nurses regarding prevention & management of needle stick injury and selected demographic variables n=100

Variables	Practice score		Chi-square value	df	P-value
	≥Median	<Median			
Professional qualification					
GNM	31	46	6.617*	1	0.0101
Other than GNM	2	21			

$\chi^2(df_1)$ 3.841, *Significant at $p<0.05$

Table 7 revealed that there was significant association found between practice score with professional qualification at 0.05 level of significance.

Discussion

Discussion related to the demographic characteristics of staff nurses

Present study supported by Mrs. Dasgupta S, Dr. Dasgupta A (2019) [6] was done a study to estimate the knowledge of staff nurses regarding prevention and management of needle stick injuries. Convenient sampling technique was used to select 100 professionally qualified (GNM Gr. II) staff nurses of a District Hospital in West Bengal. The study finding reveled that among 100 sample 62% had NSI, among them 72% did not report Needle Stick Injury [6].

Discussion related to the knowledge of staff nurses regarding prevention & management of needle stick injury

Present study supported by George F (2020) [7] was conducted a study to assess the effectiveness of structured teaching programme on knowledge regarding prevention and management of needle stick injury among selected student nurses. 100 student nurses were selected using stratified random sampling technique. Results of the pre-test revealed that about 5% had good knowledge score, 44% had poor knowledge, and 51% had average knowledge about prevention and management of needle stick injury [7].

A similar study was conducted by Mohammed MU, Reddy K V (2020) [8] to assess the knowledge of Needle stick injuries (NSI) among nursing staffs, among nursing staffs of a tertiary care teaching hospital. Subjects were 100 nursing staffs. Response rate was 80%, Incidence of NSI was 45%, Only 24% of the nurses were aware of the definition of NSI, about 90% of them were aware of the infections transmitted, 85% of them are unaware of 'no-recapping' technique of disposal, 90% of them were aware of standard precautions, Overall knowledge is adequate among 65% nurses. Only 35% nurses reported their NSI after incident, 24% knew post exposure prophylaxis, 98% of the reported NSI incidents NSI were due to recapping of needles [8].

Another study conducted by Buyite ST *et al* (2021) [9] to assess knowledge, attitude, and practice on injection safety among staff nurses in MGM Hospital at Aurangabad. A descriptive research design was done among 100 staff nurses. Subjects were selected by non- probability purposive sampling. Results found that 64% had average knowledge. [9]

Discussion related to the practice of staff nurses regarding prevention & management of needle stick injury

Buyite ST *et al* (2021) [9] conducted a study to assess knowledge, attitude, and practice on injection safety among staff nurses in MGM Hospital at Aurangabad. A descriptive research design was done among 100 staff nurses. Results found that among staff nurse's majority, 69% had average practice, followed by 5% had good practice and 26% had poor practice regarding injection safety [9].

A similar study conducted by Kulkarni RS, Giri PA, Gangwal PR (2016) [10] to assess the knowledge and practices amongst nurses regarding injection safety. A total of 70 nurses were enrolled in this study. Results found that majority 92.85% nurses knew that sharp waste should be discarded in blue container but while practicing only 40% of nurse's segregate sharp waste and 81.43% of the nurses

didn't wear protective gloves while giving injection. The present study concluded that there was average level of knowledge and poor practices on injection safety amongst nurses [10].

Discussion related to the relationship between knowledge and practice of staff nurses regarding prevention & management of needle stick injury

This study finding was supported by Mrs. Dasgupta S, Dr. Dasgupta A (2019) [6] conducted a study to assess the knowledge of staff nurses regarding prevention and management of needle stick injuries. Convenient sampling technique was used to select 100 professionally qualified (GNM Gr. II) staff nurses of a District Hospital in West Bengal. The study findings revealed that there is significant relationship between knowledge and practices of staff nurses ($r= 0.7$, $t= 11.12$, $p< 0.05$) [6].

Discussion related to the association between knowledge of staff nurses with selected demographic variables

The present study result was unsupported by Mrs. Dasgupta S, Dr. Dasgupta A (2019) [6] conducted a study to estimate the knowledge of staff nurses regarding prevention and management of needle stick injuries. Convenient sampling technique was used to select 100 professionally qualified (GNM Gr. II) staff nurses of a District Hospital in West Bengal. Chi -square test also showed significant association between knowledge and practice scores and incidence of NSI (P <05) [6].

Another study by Alwabr, Gawad M. A (2018) [11] was conducted to assess the level of knowledge and practice of needle sticks injury prevention measures and to estimate the incidence of exposure to needlestick injury among nurses working in the governmental hospitals. A cross-sectional study among a random sample of nurses (n = 259) were conducted. Results found that there was a statistically significant association (P < 0.001) between the knowledge and practice [11].

Discussion related to the association between practice of staff nurses with selected demographic variables

The present study result was unsupported by Mrs. Dasgupta S, Dr. Dasgupta A (2019) [6] done a study to estimate the knowledge of staff nurses regarding prevention and management of needle stick injuries. Convenient sampling technique was used to select 100 professionally qualified (GNM Gr. II) staff nurses of a District Hospital in West Bengal. Chi -square test also showed significant association between knowledge and practice scores and incidence of NSI (P <05) [6].

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Conclusion

From the above study it can be concluded that majority of the study participants had average knowledge and practice regarding prevention & management of needle stick injury. There was significant positive correlation found between knowledge and practice regarding prevention & management of needle stick injury. Increasing awareness among Staff Nurses and providing regular training on safe use of needle, Standard injection safety guidelines and use of Universal precautions is highly recommended.

Conflict of Interest

Not available.

Financial Support

Not available.

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