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Knowledge Regarding Needle Stick Injury & use of Personal Protective Equipment among Nurses at Dhaka Medical College Hospital, Dhaka

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ABSTRACT

Background: Health care workers are at increased risk of acquiring blood-borne infections as they are occupationally exposed to blood and body fluidsoccupational hazards such as needle stick injuries, sharps injury. Properly use of Personal Protective Equipment or PPE to help protect health care workers.

Objective*:* This study was conducted to assess the level of Knowledge Regarding Needle Stick Injury & use of Personal Protective Equipment among Nurses at Dhaka Medical College Hospital, Dhaka.

Methods & materials: The study was a cross-sectional study, which was conducted at Dhaka Medical College Hospital, Dhaka, Bangladesh during the period from January to December 2021. The study included purposively selected 200 nurses who are directly works with patients. Data were collected by face-to-face interview with a pretested, semi- structured questionnaire and an observational checklist. Data were analyzed by current Statistical Package for Social Sciences (SPSS). Informed written consent was taken from each nurse.

Results: The study findings show that, among 200 respondents, 65% had good knowledge about Needle sticks injury, 30% had average knowledge and only 5% had poor knowledge about Needle sticks injury and 56% had good knowledge about personal protective equipment, 26% had average knowledge and only 18% had poor knowledge regarding personal protective equipment at Dhaka Medical College Hospital, Dhaka.

Conclusion: In conclusion, the best way to reduce NSI is to impart knowledge and awareness about it. Reporting of sharp injuries, preventive measures and post exposure prophylaxis and follow up should be the core issues to Infection prevention and control.

ARTICLE DETAILS

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INTRODUCTION

Needle stick injury (NSI) means penetrating stab wound, introducing blood or other potentially hazardous material into the body of healthcare worker (HCW), during the performance of their duties, by a hollow bore needle or sharp instruments including needles, lancets, scalpels(1,9). World Health Report 2002 states that 2 million people experience percutaneous exposure to infectious diseases each year among the 35 million healthcare workers (2). NSIs among HCWs are associated with various health hazards; the potential high-risk pathogens are the Human immunodeficiency virus (HIV), Hepatitis B (HBV) and Hepatitis C (HCV). World Health Report 2002 also noted that 37.6 % of Hepatitis B, 39 % of Hepatitis C and 4.4 % of HIV / AIDS in health care workers worldwide were due to needle stick injuries (2). Many studies worldwide have shown that more than 35 million HCWs are facing percutaneous injuries with contaminated sharps every year (3). In India, around 3 – 6 billion injections are given per year, of which two-third injections are unsafe (62.9 %), and the use of glass syringe is constantly associated with a higher degree of unsafeness (4).To prevent needle sticks

injury need to wear disposable gloves when changing the sharps bin to minimize any risk of blood borne diseases. Dispose of the gloves in a clinical waste bag. Seal the sharps bin before moving and only transport it using the handle. Health care workers are at increased risk of acquiring blood-borne infections as they are occupationally exposed to blood and body fluids. Nurses are potentially exposed to infectious materials such as blood, body fluids, tissue, medical equipment or environmental surfaces contaminated with these substances in their workplace. They are frequently exposed to occupational hazards such as needle stick injuries, sharps injury, contact with the mucous membrane of an infected person's eyes or mouth, contact with non-intact skin exposed with blood or other potentially infectious body fluids. In the workplace, it is vital that workers feel safe and protected, especially workers who have a high risk of coming into contact with used or discarded needles. Under the 2011 Work, Health and Safety Act employers have a responsibility to provide a working environment that is safe and without risks to employees health. One of the strategies outlined in the Act is the use of Personal Protective Equipment or PPE to help protect health care workers.

Nurses have been found with more needle stick injury rates among health care workers (5,10) as they are the primary contacts with patients in a medical care setting. The lack of practice about NSIs and awareness of preventive measures might be one of the reasons for a higher rate of NSIs among them. Therefore the present study was aim to reveal to assess the level of Knowledge Regarding Needle Stick Injury & use of Personal Protective Equipment among Nurses at Dhaka Medical College Hospital, Dhaka.

MATERIALS AND METHODS

Study design: The study was a Cross-sectional Study to the Knowledge Regarding Needle Stick Injury & use of Personal Protective Equipment among Nurses at Dhaka Medical College Hospital, Dhaka.

Study setting: The study was conducted at Dhaka Medical College Hospital, Dhaka, Bangladesh. Those hospitals are the largest hospital in Dhaka city during the period from January to December 2021.

Sample size and sampling: The sample size was calculated by using the formula: $n=z^2pq/d^2$.The calculated sample size was 200. Sample was included following non-randomized purposive sampling technique and using a standard written informed consent form.

Data collection: Data were collected by face-to-face interview with the help of pre-tested semi-structured questionnaire and an observational checklist was used to observe PPE use practice.

Data analysis: The data collected from the respondents were analyzed after completion of data collection, to maintain consistency; data were checked, edited manually and verified before tabulation. Data were coded, entered and analyzed in a computer. Data was analyzed by using the statistical software namely SPSS (Statistical Package for Social Sciences).

Ethical implication: Ethical clearance was obtained from the Institutional Review Board (IRB) and permission was taken from the ethical clearance committee of Dhaka Medical College Hospital Dhaka, Bangladesh for data collection. Informed written consent was taken from the each patient informing purpose, procedure, risk and benefits of the study. Privacy of the patient and confidentiality of data were maintained strictly.

RESULT

This cross sectional study was carried out among 200 nurses to assess the level of Knowledge Regarding Needle Stick Injury & use of Personal Protective Equipment among Nurses at Dhaka Medical College Hospital, Dhaka. The respondents were interviewed face to face by using a pre tested semi-structured questionnaire. In addition an observational checklist was used to observe the current practices to PPE use in that hospital. This resulted in a response rate of 100%. Collected data were processed and analysed with the help of SPSS (Statistical Package of Social Science) version 25. This chapter represents findings of those data.

Table 1. Distribution of the respondents according to Socio-Demographic characteristics of the respondents(n=200)

Age group (in complete years)	Frequency (n)	Percentage (%)
Below 25 years	6	3%
25 – 35 years	121	60.5%
36 – 45 years	30	15%
46 – 55 years	25	12.5%
Above 55 years	18	9%
Mean (±SD) age	33.96 (±9.064)	
Sex		
Female	183	91.5%

Male	17	8.5%
Level of education		
Diploma in nursing	128	64%
B.Sc in nursing	61	30.5%
MPH/M.Sc in nursing	11	5.5%
Job experience		
<5 years	25	12.5%
6-10 years	102	51%
11-15 years	23	11.5%
16-20 years	32	16%
>20 years	18	9%
Special training on waste disposal & use of PPE		
Yes	63	31.5%
No	137	68.5%
Total	**200**	**100%**

Table 1 show the distribution of the respondents according to socio-Demographic characteristics. Out of 200 respondents, the mean age of the respondents was 33.96±9.064 years. The majority number 121(60.5%) of the respondents belonged to 25-35 years of age and above 55years age group were senior most group only 6(3%) were lowest number. Only 30 (15%) respondents were 36-45 years age groups. Minimum age was 22 and maximum 59 years. Among them, 183 (91.5%) were female and rest of them 17 (8.5%) were male.Here, out of 200 respondents, more than half 128 (64%) of the respondents level of education were Diploma in nursing, 61 (30.5%) were B.Sc in nursing and 11 (5.5%) were MPH/M.Sc in nursing. Length of service of the respondents, 25 (12.5%) respondents length of service were <5 years,102 (51%) were 6 -10 years, 23 (11.5%) were 11 – 15 years, 32 (16%) 16 – 20 years, and rest of them 18 (9%) respondents length of service were >20 years. Among 200 respondents, 63(31.5%) respondents attended special training on waste disposal & use of PPE while 137(68.5%) respondents had not attended training.

Table 2. Distribution of the respondents according to knowledge about needle sticks injury (n=200)

Traits	**Frequency (n)**	**Percentage (%)**
Needle sticks injury means injury while using syringe, suture needle, vaccination needle etc.		
Yes	181	90.5%
No	19	9.5%
Hepatitis-B, Hepatitis-C and AIDS can be transmitted by needle sticks injury		
Yes	200	100%
No	00	00%
Needle sticks injury more occurs during recap the syringe		
Yes	127	63.5%
No	73	36.5%
Have chance to occurs needle sticks injury in operation theatre		
Yes	190	95%
No	10	5%
Clean worker have more chance to get needle sticks injury		
Yes	110	55%
No	90	45%
Clean worker have more chance to get needle sticks injury during west disposal		
Yes	149	74.5%
No	51	25.5%
Did you report the higher authority while you getting needle sticks injury?		
Yes	13	6.5%
No	187	93.5%

Do you think it is important to report?		
Yes	123	61.5%
No	77	38.5%
Have any evidence that higher authority took any action after reporting?		
Yes	5	2.5%
No	195	97.5%
Do you think post-exposer prophylaxis is important for the management of needle sticks injury?		
Yes	187	93.5%
No	13	6.5%
Do you know about protective materials to prevent needle sticks injury?		
Yes	152	76%
No	48	24%
Do you know about universal precaution guideline?		
Yes	123	61.5%
No	77	38.5%
Total	200	100%

Table 2 show the distribution of the respondents according to knowledge about needle sticks injury. About 181 (90.5%) respondents reported that needle sticks injury more occurs during recap the syringe, 200 (100%) respondents responds Hepatitis-B, Hepatitis-C and AIDS can be transmitted by needle sticks injury, while 127 (63.5%) told needle sticks injury more occurs during recap the syringe, 190 (95%) respondents think have chance to occurs needle sticks injury in operation theatre, 110 (55%) told clean worker have more chance to get needle sticks injury, only 13 (6.5%) respondents reported the higher authority while getting needle sticks injury, 123 (61.5%) respondents think it is important to report higher authority, 195 (97.5%) respondents told have no evidence that higher authority took any action after reporting and187 (93.5%) think post-exposer prophylaxis is important for the management of needle sticks injury. Here, out of 200 respondents, 152 (76%) knew about protective materials to prevent needle sticks injury and 123 (61.5%)knew about universal precaution guideline.

Table 3. Distribution of the respondents according to knowledge about use of personal protective equipment (PPE) (n=200)

Traits	**Frequency (n)**	**Percentage (%)**
Know about Personal Protective Equipment		
Yes	194	97%
No	6	3%
Infectious Diseases Hospital staffs use PPE to protect from getting infection		
Yes	96	48%
No	114	57%
Know about the recommended guideline for wearing (PPE)		
Yes	111	55.5%
No	89	44.5%
Hand hygiene is necessary before donning of		
Yes	180	90%
No	20	10%
Hand hygiene is necessary after doffing of		
Yes	180	90%
No	21	10.5%
Separate place is needed for donning and doffing		
Yes	162	81%
No	38	19%
Used PPE management is important to control infection		
Yes	172	86%
No	28	14%
Total	**200**	**100%**

Table 3 shows distribution of the respondents according to knowledge about Personal Protective Equipment (PPE). Out

of 200 respondents, 194 (97%) had knowledge about personal protective equipment. Here, 96 (48%) respondents told Infectious Diseases Hospital staffs use PPE to protect from getting infection, more than half 111 (55.5%) respondents had knowledge about the recommended guideline for wearing (PPE), 180 (90%) respondents thinkh and hygiene is necessary before donning of and after doffing of, 162 (81%) respondents told separate place is needed for donning and doffing and 172 (86%) respondents mentioned used PPE management is important to control infection.

Table 4: Distribution of the respondents according to practice about use of personal protective equipment (PPE) (n=200)

Traits	**Frequency (n)**	**Percentage (%)**
Wash hand with soap and water to maintain hand hygiene		
Yes	198	99
No	2	1
Steps taken after determining the infectious patients		
Yes	157	78.5
No	63	31.5
Use personal protective equipment during handle with infectious patient		
Yes	180	90
No	20	10
Use mask during contact with infected person and non-infected person		
Yes	166	83
No	34	17
Advice the infected and non-infected person to wear mask		
Yes	176	88
No	24	12
Maintain the correct steps (Hand wash, wear cap, gloves, gown, mask, face shield, gloves again and shoe covers) of donning (putting on)		
Yes	150	75
No	50	25
Maintain the correct steps (At first wash hand with gloves, pullout shoe covers, face shield, gloves, gown, hand wash again, pullout mask, cap, last gloves and at last wash hand) of doffing (putting off)		
Yes	150	75
No	50	25
Using color coded bin to dispose infectious waste		
Yes	133	66.5
No	67	33.5
Use red box to discard sharp waste		
Yes	170	85
No	30	15
Total	**200**	**100%**

Table 4 shows distribution of the respondents according to knowledge about Personal Protective Equipment (PPE). Among 200 respondents, almost all of the respondents 198 (99%) washed hand with soap and water to maintain hand hygiene, 157 (78.5%) told that steps taken after determining the infectious patients, 180 (90%) respondents use personal protective equipment during handle with infectious patient, 166 (83%) usemask during contact with infected person and non-infected person, 176 (88%) advice the infected and non-infected person to wear mask, 150 (75%) respondents maintain the correct steps of donning and doffing, 133 (66.5%) use color coded bin to dispose infectious waste and 170 (85%) respondents use red box to discard sharp waste.

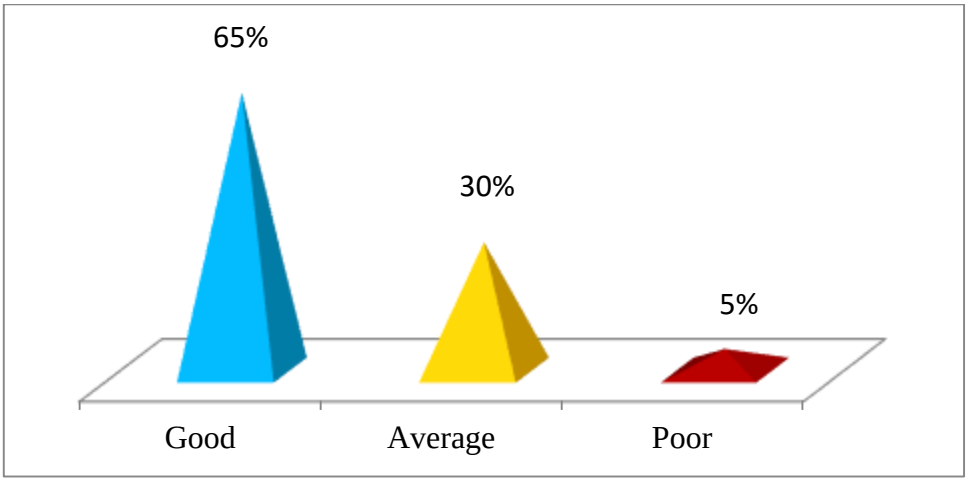

Figure 1: Distribution of the respondents according to level of knowledge regarding needle sticks injury (n=200) Level of knowledgeregarding needle sticks injury

Figure 1 reveals distribution of the respondents according to level of knowledge regarding Needle sticks injury. Among 200 respondents, 65% had good knowledge about Needle sticks injury,30% had average knowledge and only 5% had poor knowledge about Needle sticks injuryat Dhaka Medical College Hospital, Dhaka.

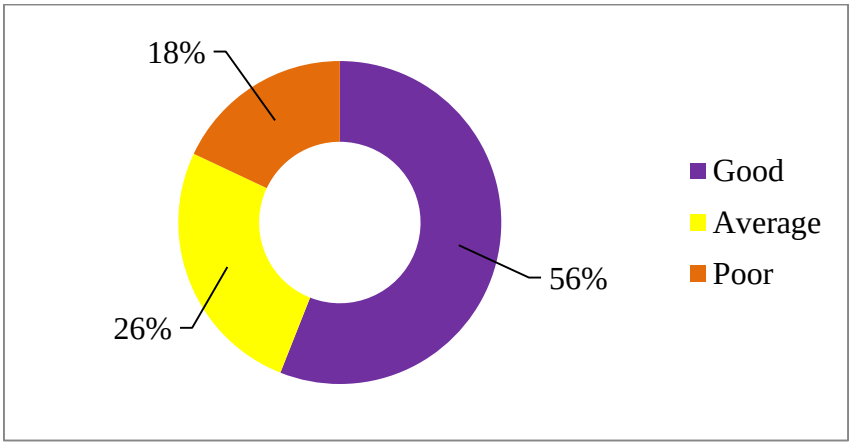

Figure 2: Distribution of the respondents according to level of knowledge regarding personal protective equipment (PPE) (n=200) Level of knowledge regarding personal protective equipment

Figure 2revealsdistribution of the respondents according to level of knowledge regarding personal protective equipment (PPE). Among 200 respondents 56% had good knowledge about personal protective equipment, 26% had average knowledge and only 18% had poor knowledge regarding personal protective equipment atDhaka Medical College Hospital, Dhaka.

DISCUSSION

Health professionals face a determined risk of occupational exposure to blood-borne viruses such as the HIV, the hepatitis B virus (HBV), the hepatitis C virus (HCV) and HIV/AIDS. In the present study, 181 (90.5%) respondents reported that needle sticks injury more occurs during recap the syringe, 200 (100%) respondents responds Hepatitis-B, Hepatitis-C and AIDS can be transmitted by needle sticks injury, while 127 (63.5%) told needle sticks injury more occurs during recap the syringe, 190 (95%) respondents think have chance to occurs needle sticks injury in operation theatre, 110 (55%) told clean worker have more chance to get needle sticks injury, only 13 (6.5%) respondents reported the higher authority while getting needle sticks injury, 123 (61.5%) respondents think it is important to report higher authority, 195 (97.5%) respondents told have no evidence that higher authority took any action after reporting and187 (93.5%) think post-exposer prophylaxis is important for the management of needle sticks injury. Here, out of 200 respondents, 152 (76%) knew about protective materials to prevent needle sticks injury and 123 (61.5%) knew about universal precaution guideline. According to Varsha K. Pavithran et al.,[6]79% respondents considered the injury caused while using all of the instruments (hand, rotary, surgical, hypodermic needles, suture needles, and lancets) constituted NSIs and SIs and 7% considered

hypodermic needles, suture needles, and lancets to constitute NSIs and Sis (6).

Taghrir et al., conducted a study on COVID-19 based on knowledge, preventive behaviors, and risk perception among Iranian medical students, on which they reported that only 43.3% had received any kind of education about COVID-19; however, there was no significant difference of response between those who had not attained any kind of education in his study. In the same study, 85.5% of the participants responded the use of PPE such as face mask can help prevent the transmission of COVID-19 and 79.2% of the study population knew the use of N95 respirators with face shield during aerosols producing procedures (7).

This study revealed, Among 200 respondents, 65% had good knowledge about Needle sticks injury, 30% had average knowledge and only 5% had poor knowledge about Needle sticks injury at Infectious Diseases Hospital and respondents 56% had good knowledge about personal protective equipment, 26% had average knowledge and only 18% had poor knowledge regarding personal protective equipment at Infectious Diseases Hospital.

A study conducted by Modi et al., among the health-care students and professionals in the Mumbai metropolitan area showed 45.4% of responders knew the right sequence of donning and doffing of the PPE. The results were slightly higher in the present study; about 67.8% of the study population responded correctly. However, there is still the need for in-depth training and briefing of the health-care workers regarding the different safety aspects about the use of PPE such as using a right PPE kit for a different scenario, the sequence of donning and doffing of soiled PPE, standard etiquette while using PPE, and maintaining personal hygiene (8).

This study shows the knowledge among nurses regarding needle sticks injury & the use of PPE is good but lacks in-depth knowledge about handling and disposal of used PPE, which is crucial in a pandemic situation such as COVID-19.

CONCLUSION

Needle stick injuries represent a severe occupational hazard that health care workers in hospitals face daily. The best way to reduce NSI is to impart knowledge and awareness about it. Reporting of sharp injuries, preventive measures and post exposure prophylaxis and follow up should be the core issues to be addressed as a part of Infection prevention and control training to all HCWs. The management should plan these as an ongoing activity in the hospital. There should be development of health safety policies, regular training on personal protective equipment, provision of personal protective equipment and changing health attitude to ensure safety first.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

REFERENCES

I. Needlestick injuries. Bandolier Extra 2003.http://www.jr2.ox.ac.uk/bandolier/Extraforbando/needle.pdf
II. World Health Organization. Occupational healthneedlestick injuries. 2002. https://www.whi.int/occupational_health/topics/needinjuries/en/ [Last accessed on April 10 2021]
III. Prüss-Üstün A, Rapiti E, Hutin Y. Estimation of the global burden of disease attributable to contaminated sharps injuries among health-care workers. Am J Ind Med 2005;48(6):482-90.
IV. Kermode M, Muani V. Injection practices in the formal and informal health-care sectors in rural north India. Indian J Med Res 2006;124(5):513-20.
V. ICN on Preventing Needlestick Injuries. Nursing Matters: Fact Sheets 2009. medicalkenya.co.ke/2011/02/nursingmatters-who-fac-sheet
VI. Varsha K. Pavithran, R. Murali, Madhusudan Krishna,1 A. Shamala, MaanasiYalamalli, and A. Vinod Kumar. Knowledge, attitude, and practice of needle stick and sharps injuries among dental professionals of Bangalore, India.J. IntSocPrev Community Dent. 2015 Sep-Oct; 5(5): 406–412.
VII. Taghrir M.H., Borazjani R., Shiraly R. COVID-19 and Iranian Medical Students; A survey on their related-knowledge, preventive behaviors and risk perception. Archives of Iranian Medicine. 2020;23(4):249–254.
VIII. Modi P.D., Nair G., Uppe A., Modi J., Tuppekar B., Gharpure A.S., Langade D. COVID-19 awareness among healthcare students and professionals in Mumbai metropolitan region: a questionnaire-based survey. Cureus. 2020;12(4)
IX. Abukhelaif, A.E. Personal Protective Equipment Knowledge and Practices among Nurses Working at Al-Baha King Fahad Hospital, Saudi Arabia. *ARCHIVOS DE MEDICINA*, 2019*4*(1), p.2.
X. Acharya, A.S., Khandekar, J., Sharma, A., Tilak, H.R. and Kataria, A. Awareness and practices of standard precautions for infection control among nurses in a tertiary care hospital. Nursing Journal of India, 2013.104(6), p.275.