Original Article

Knowledge and Practice of Injection Safety among Nurses Working in Tertiary Health Science Institute of Eastern Nepal

Sarobara Rayamajhi[1,*], Ambika Thapa Pachya[2]
[1]Lecturer, Norvic Institute of Nursing Education, Kathmandu
[2]Public Policy Fellow, Daayitwa; Editor, Journal of Karnali Academy of Health Sciences
***Corresponding Author:**
Sarobara Rayamajhi, Email: rayamajhibuni@gmail.com

ABSTRACT

Background: Injections are among the nursing procedures which are commonly performed worldwide. Unsafe injections occur routinely in most developing world regions, implying a significant potential for the transmission of blood borne pathogen. Unsafe injections currently account for a significant proportion of all new hepatitis B and C infections. This study was done to explore the factors affecting knowledge and practices and to carry out observation in selected sample.

Material and Methods: A descriptive cross-sectional study design was used to conduct the study among 143 nurses working at selected wards of BPKIHS using self-administered questionnaire. The Medical, Surgical, Emergency, Orthopedic, ICU, SICU, Gynecology, Antenatal and Postnatal wards were selected purposively and the nurses were selected using population proportionate stratified random sampling. Observation of the 30 injection procedure was carried out .Collected data was analyzed using various descriptive and inferential statistics.

Results: The mean age of the respondents was 25.48±3.66 years. Poor knowledge was seen among 33.6% and good knowledge was seen among 66.4% of the respondents. Similarly, good practice was observed among 11.2% and excellent practice was observed among 88.6% of the respondents. Significant association was found between knowledge and socio-demographic variables i.e. total work experience (p 0.023), vaccination against hepatitis B (p<0.001)

Conclusion: The study concluded that one third of the nurses had good knowledge regarding injection safety and majority of the nurses had excellent practice. The major lacking was seen related to the steps to be taken immediate after needle stick injury, practices of recapping of the syringes and coverage of the Hepatitis B vaccination. We recommend the authority of the study setting to prioritize these components. Further participatory observation studies are required to explore factors related to the knowledge and practices of safe injection practices.

Keywords: Nurses, Knowledge, Practice, Safe Injection Practice, Needle Stick Injury

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INTRODUCTION

Injections are one of the commonly performed nursing procedures, with annual 16 billion injections administered globally. [1-3] Injection recipients and health-care workers are at risk via contaminated needles and syringes and the community at large through contaminated sharps waste.[4] Unsafe injections currently account for a significant proportion of all new hepatitis B and C infections.[5-6] To ensure that all healthcare workers understand and adhere to recommended practices, principles of infection control and aseptic technique need to be reinforced in training programs and incorporated into institutional polices.[7] There are few studies done among nurses in Nepal, however nurses contribute to the major care provider to deal with both inpatient and outpatient provision of the injection provisions.[8,9] A cross sectional was study done in western Nepal that showed gaps between knowledge and practice of injection safety among nurses.[8] Thus, this study was done to explore the factors affecting knowledge and practices and to carry out observation in selected sample.

MATERIAL AND METHODS

This was a descriptive cross-sectional study done in nurses working in inpatient departments of BP Koirala Institute of Health Sciences (BPKIHS), Dharan. Medical, Surgical and Orthopedic, Emergency and Intensive Care Unit and Maternity Wards were identified to have major injection procedures.

Sample Size: Using Cochrane formula, prevalence of good knowledge[8]= 57.7%, allowable error 8.65 and a non-response rate of 10%, sample size=143. From this set, 30 observations were done based on feasibility.

Sampling technique: Population proportionate stratified random sampling technique was used to conduct the study. Ward considered as strata and sample take for each ward was calculated. From the list of the nurses fulfilling eligibility criteria, lottery method was used to reach the participating nurse and after obtaining consent, the participant was included in the study. Similarly for observation similar approach was adopted.

Inclusion criteria:

- Nurses available in the ward during the data collection period, willing and consenting to participate
- Nurses with at least three months of experience of working in the same ward

Data collection

Informed written consent was taken with the study participants. Self-administered questionnaire with socio demographic information (age, nursing qualification, work experience, vaccination status, training), 10 item for knowledge guided by WHO tool C-Revised and 16 item for practice guided by WHO tool C-Revised in Likert scale using 3 points (always, sometimes, never) for practice based questionnaire were used for data collection. Content validity of the instrument was obtained and maintained by consultation with the research mentor, supervisors and subject experts. Pretesting was done among 15 nurses, who were later excluded in the main study, to assess the flow of the question and language.

Participants work schedule was kept into consideration and data was collected without any hindrance to routine and emergency situation to selected units. Participants were informed about their voluntary participation and were requested to fill the self-administered questionnaire in front of researcher to prevent data contamination.

Observation of safe injection practice among 20% of the sample i.e.30 procedures was done. Non participatory observation was done after informing the ward in-charge. The observation was done as the staff nurses perform injection procedure i.e. giving intramuscular injection or performing intravenous injections. Six observations per wards were done. Observation was done in the morning (8-12am) and evening shift (2-4pm). Each procedure was observed only one time using component from standard operation procedure checklist.

Ethical consideration:

Ethical clearance was obtained from the Institutional Ethical Review Committee of BPKIHS (IRC/1056/017). Then, permission from hospital matron and respective ward in-charge was obtained. Anonymity and confidentiality was maintained throughout the study and the information collected was used for research purpose only.

Data Analysis

After completion of data collection, questionnaire was checked for completeness and the filled format were handled with great care, stored and coded for

further analysis. Data was entered in MS Excel 2013 sheet and transferred to SPSS version 11.5. The scores obtained by respondents were interpreted and grading was done of the overall score obtained. The grade obtained by the respondents was converted into percentage. Knowledge was categorized as poor (0-49%), good (50-69%) and excellent (>70%).Similarly practice was categorized as poor (0-49%), good (50-69%) and excellent (>70%). Observation items were taken in frequencies and percentage.

Data was analyzed by using SPSS version 11.5. Descriptive statistics like percentage, mean and standard deviation were used to describe socio-demographic variables and anthropometric measurements. Pearson's chi square test was used to find out the association between knowledge, practice and selected socio- demographic variables. The confidence interval was taken as 95% and the level of significance α=0.05.

RESULTS

The study participants were all female with mean age (±standard deviation) of 25.48 (±3.66) years and 76.2% (n=109) had completed their certificate of nursing, 83.9% (n=120) had more than one year of experience and, 68.7% (n=101) were working in the same ward for more than one year. Among the participants 69.0% (n=113) were immunized against Hepatitis B. Only 21.7% (n=31) had received training on injection safety however 44.1% (n=63) had experienced needle stick injury. (Table 1)

Knowledge on Safe injection Practices

Overall knowledge of the participants showed that 66.4% (n=95) had good knowledge and remaining had poor knowledge of safe injection practices.

Participants were aware on most of the component of the safe injection practices. However, reusing of the syringe (528%, n=75) and recapping (49.3%, n=70) were also responded as the component of the safe injection practice. (Table 2

Table 1: Socio-demographic Characteristics of Respondents (n=143)

Socio demographic Characteristics	Categories	Frequency(n)	Percentage(%)
Age(in years) M±SD=25.48±3.66 Range(19-38)	≤25	65	45.5
	>25	78	54.5
Qualification	PCL	109	76.2
	BN/B.Sc	34	23.8
Work Experience	<1yrs	23	16.1
	1-5yrs	85	59.4
	>5yrs	35	24.5
Currently Working Ward	Medical	28	19.6
	Orthopedics and Surgical	31	21.7
	Emergency and intensive care	64	44.8
	Maternity	20	14.0
Experience in Current Ward	<1yr	42	29.4
	1-3yr	46	32.2
	>3yr	55	38.5
Training on Injection Safety	No	112	78.3
	Yes	31	21.7
Immunization against HBV	No	30	21.0
	Yes	113	79.0
Experience of Needle Stick Injury	No	80	55.9
	Yes	63	44.1

Table 2: Knowledge on components of safe injection practices		
Components of Safe Injection Practice (multiple response)	**Frequency**	**Percentage (%)**
Does not expose provider to any Risk	94	67.1
Does not harm the patient	120	85.7
Does Not Become a Hazard	93	66.4
Use of Sterile Equipment	113	79.6
Reconstituting Drugs Safely	85	59.9
Proper Disposal of Injection Waste Including Sharp	114	80.3
Use of Aseptic Technique	76	53.5
Proper Disposal of Injection Waste Including Sharp	114	80.3
Use of Aseptic Technique	76	53.5
Reusing the Syringe	75	52.8
Using Both Hand to Recap the Needle After Use	70	49.3

Among the participants, 95.7% (n=134) responses on HIV,75.0% (n=105) responses on Hepatitis B and C, 34.8% (n=48) responses on abscess and 33.6% (n=47) responses on septicemia were received on diseases caused by unsafe injection practices. Very few participants responded (6.4%, n=9) on hemorrhagic fever. There were 57.9% (n=81) response on cancer as one of the disease caused by unsafe injection.

The assessment of the knowledge on needle handling part showed that recapping (80.4%, n=115) and first step after needle stick injury (45.5%, n=65) had incorrect knowledge in these aspects. (Table 3)

Safe injection practices

Overall responses on practices of the participants showed that 11.1% (n=16) of the participants had good practice and majority (88.9%, n=127) had excellent safe injection practices. Injection preparation practices of most of the participants were at par.

There were participants who responded that they never washed hands after giving injections (n=1) and who washed hands only sometimes (14.7%, n=21) after touching the blood or body fluid.

Observation Report of Injection Procedure Performance

During observation in 30 sample, 73.33% (n=22) did not use a tray, 66.66%) (n=20) did not wash hands before preparing injection, 40.0% (n=12) touched the skin site after preparation, 86.66% (n=22) of the respondents recapped the needle after use. (Table 4)

Association between Knowledge, Practices and Socio-demographic Characteristics of Respondents

There was no association seen between socio-demographic characteristics of respondents and knowledge and practices regarding injection safety. No association was found between participants' characteristics and practices. Significant association was found between work experience, vaccination and needle stick injury and knowledge regarding injection safety. (Table 5)

Table 3: Knowledge on Waste and Needle Handling of Participants (n=143)

Waste and Needle Handling	**Correct n (%)**	**Incorrect n (%)**
Recapping of Needle	28(19.6)	115(80.4)
Safety Boxes Level to be Filled before Sealing	87(60.8)	56(39.2)
Sharp Waste	119(83.2)	24(16.8)
First Step after Needle Stick Injury	78(54.5)	65(45.5)
Discarding of Infectious Waste	127(88.8)	16(11.2)

Table 4: Observation Report of Injection Procedure Performance of Respondents (n=30)

Injection Practice Observed	Yes n (%)	No n (%)
Injection was prepared on a tray	8(26.66)	22(73.33)
Washed hands before preparing injection	10(33.33)	20(66.66)
Used a new pair of gloves	25(83.33)	5(16.66)
Explained the procedure	22(73.33)	8(26.66)
Appropriately secured the intended puncture site	25(83.33)	5(16.66)
Cleaned the skin before giving the injection	30(100)	-
i. Freshly prepared single use swab with 70%	12(40)	-
ii. Wet swab stored in a container	18(60)	-
Touched the skin puncture site after preparation	12(40)	18(60.0)
IV cannula or syringe taken from a sterile packet	30(100)	-
Disposed the sharps in an appropriate container	25(83.33)	5(16.66)
Recapped the needle after use	26(86.66)	4(13.33)
Washed hands after the procedure	19(63.33)	11(36.66)
Recorded the procedure properly	29(96.66)	1(3.33)

Table 5: Association between patients' characteristics and knowledge of safe injection

Participants characteristics	Knowledge		Chi- square Value	p value
Age	**Poor n (%)**	**Good n (%)**		
Work experience			7.54	0.023
<1years	10(43.5)	13(56.5)		
1-5years	21(24.7)	64(75.3)		
>5years	17(48.6)	18(51.4)		
Vaccination against Hepatitis B			15.085	<0.001
Not Vaccinated	19(63.3)	11(36.7)		
Vaccinated	29(25.7)	84(74.3)		
Needle Stick Injury			25.464	<0.001
Not experienced	41(51.2)	39(48.8)		
Experienced	7(11.1)	56(88.9)		

There was no association between knowledge and practices seen in the study (p=0.441).

DISCUSSION

The study showed higher proportion of participants having good knowledge and practice on injection safety.

Only 21.7% were trained in injection safety. This is low as compared to study done in Pokhara (30.5%) though it is higher than study reported in Baglung (10%).[8,9] All these proportions are inadequate in terms of training nurses on injection safety. There were 44.1% participants who were exposed to needle stick injury in last 12 months which is higher than study done in rural India (25.6% and 18.6%).[10,11] In addition in our study there were 45.5% participants unaware on what is to be done as first step after needle stick injury and a high proportion of 80.4% had incorrect information on needle handling related to recapping. Recapping practices were also seen during the observation of the samples. Thus, the capacity building of the hospitals needs to prioritize these components of injection safety as part of in-service education.

In order to address prevention and management of needle stick injuries intervention like use of safety devices have shown positive changes.[12] In this study 21% of the respondents

were yet to receive the vaccine against Hepatitis B. The participants being at risk of needle stick injury and exposure to body fluid during procedure need to be addressed as a priority agenda in the hospital.[13,14] To encourage occupational safety Ministry of Health and Population has included vaccine against Hepatitis B as one of the components within governance and management section of the minimum service readiness of the hospitals.[15] All health care settings need to follow the guidance and ensure all health care providers vaccinated against Hepatitis B for occupational safety along with availability of the post exposure prophylaxis.[16-17]

Limitations of the study

Our study has some limitations, since the practice of injection safety is directly related to the status of nursing profession, there may be chances of Hawthorne bias as the respondents might alter their behavior when they know they are being observed.

CONCLUSION

The study concluded that one third of the nurses had good knowledge regarding injection safety and majority of the nurses had excellent practice. The major lacking was seen related to the steps to be taken immediate after needle stick injury, practices of recapping of the syringes and coverage of the Hepatitis B vaccination. We recommend the authority of the study setting to prioritize these components along with post-exposure prophylaxis. Further participatory observation studies are required to explore factors related to the knowledge and practices of safe injection practices.

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