



Original article

Awareness and Practices on Injection Safety among Nurses Working in Hospitals of Pokhara, Nepal

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ABSTRACT

Introduction: The practices of unsafe injection not only harm the patient but also carry out the risks to Health Care Workers also. The study was carried out to assess awareness and practice of nurses towards injection safety. **Methods:** A descriptive cross sectional study was carried out among 220 nurses working in hospitals of Pokhara sub metropolitan city via self administered questionnaire and observation checklist. **Results:** Mean age of the nurses involved in 23.58±5.00 years. Only 30.5% had received training injection safety and 76.8% were vaccinated against HBV. The study revealed that 57.7% had good, 29.1% had average and 13.2% had poor level of awareness on injection safety. Seven-out-of-ten nurses (71.8%) had incidence of needle stick injury within last twelve months. Recapping was most prevalent practice (94.1%) among nurses and was a major cause (55.1%) of needle stick injury. **Conclusion:** Though most of the nurses had good level of awareness regarding injection safety but in practical injection safety precautions were not followed properly.

KEYWORDS: Injection safety, needle stick injury, nurses, awareness, practices

INTRODUCTION

World Health Organization (WHO) defines injection safety as "an injection that is administered using appropriate equipment, does no harm to the recipient, does not expose the provider to any avoidable risk and does not result in any waste that is dangerous to community people" [1,2]. Injection is found as most common health care procedure in both formal and informal health care sectors in now a day [3,4]. It is estimated that each year at least 50% of the world's injections are administered unsafe, mainly in developing countries which are unnecessary [5]. The practices of unsafe injection not only harm the patient but also carry risks to the Health Care Workers [6]. According to WHO estimation in 2000 unsafe injection is responsible for 501000 deaths in past and will be responsible for 9 million years of life lost between 2000 and 2030 [1]. United States report assumes 18 outbreaks of viral hepatitis in between 2001 and 2011 were associated with unsafe injection practices [2].

In the developing world, the burden of hepatitis B virus infection is highest particularly in Asia and sub-Saharan Africa [7]. Needle Stick Injury (NSI) is the non intentional puncture of the skin caused by an injection needle which is

commonly encountered by the provider [4,6]. NSI to health care workers is common problem. According to WHO estimation, worldwide each year 1 in every 10 HCWs experience a needle stick injury [7]. More than 20 diseases can be transmitted due to NSI including HIV, Hepatitis B and C, Malaria, Tuberculosis, Brucellosis, Infectious mononucleosis, Herpes, Spotted fever, Syphilis etc [8,9]. The matter of serious concern is that in developing countries, very less number of HCWs are vaccinated against Hepatitis B [6]. According to the Centers for Disease Control and Prevention (CDC) 385,000 needle sticks and other sharps injuries occur per year among hospital workers in the United States [7]. CDC report also suggests that 76% of NSIs can be reduced by the use of safety engineered devices [8]. Applying universal precautions as a safety measure can help to prevent Needle stick injuries [10].

In developed countries, Injection safety practices have been generally improved. However, in developing countries, there is an enormous increase in number of injections; neither there is sufficient care for sterile conditions [3]. Government of Nepal has been trying to deliver health care services through the mobilization of qualified health personnel and

ensuring availability of sterile devices in sufficient quantity (use of auto-disable syringe for immunization and use of safety boxes) for the achievement of safe injection practice [6].

WHO established the Safe Injection Global Network (SIGN) in 1999; it advocates a range of interventions for the promotion of injection safety [11]. WHO recommendations includes four key interventions for a safe and appropriate use of injections: increasing the population awareness regarding the risk of HIV and other infections associated with unsafe and unnecessary injections; building the safe and appropriate use of injections within national essential medicine policies to make sure there are sufficient quantities of single-use injection devices and safety boxes in every health care facility; ensuring that all donors and lenders who support the supply of injectable substances in developing and transitional countries also support the provision of injection devices with reuse-prevention features and safety boxes; managing the waste associated with dirty syringes and needles in a safe and appropriate way [1].

The objective of this study was to assess the awareness and the practice towards injection safety and to determine the factors associated with it among nurses working in public and private hospitals of Pokhara sub metropolitan city of Nepal.

MATERIALS AND METHODS

A quantitative descriptive cross sectional study was carried in nine hospitals in Pokhara sub metropolitan city of Nepal in between September 2013 to February 2014. A sample size of 220 nurses was determined based on the 70% prevalence of needle stick injury in Western, Nepal [8]. Based on the multistage sampling all 16 hospitals were divided into public and private hospitals. All 2 public hospitals were selected purposively and 7 private hospitals (50% of the private hospitals) were selected randomly. The required number of study population were selected proportionately (53%) from each hospital. The respondents were selected conveniently who were present on hospital during data collection. Pre-tested self administered questionnaire and observation checklist were used to gather the information.

Nursing education, work experience, training on injection safety (universal precautions) and regular supervision were considered as independent variables whereas levels of awareness and injection practices were considered as dependent variables. Level of awareness was classified as good (9-12), average (5-8) and poor (0-4) based on responses twelve questions regarding safe injection practices. The study was carried out after receiving ethical approval of from Pokhara University. Written approval for the conducting the study was taken from administration of all selected hospitals. Consent was taken from each respondents and the confidentiality of the received information was maintained. The data collected were tabulated and analyzed using SPSS version 16.0.

RESULTS

Socio-demographic characteristics: Out of 220 nurses interviewed, above two third (68.2%) were within age group 20-24 years with mean age of 24.38 ± 5.00 years. About two-

third (66.8%) of the nurses had nursing qualification of Proficiency Certificate Level (PCL) in Nursing. Most of the nurses (83.2%) had experience of less than five years and only less than one-third (30.5%) had received training on universal precaution/injection safety. Similarly about three-fourth (76.8%) of the nurses were vaccinated against HBV. (Table 1)

Awareness on injection safety: The study showed that awareness on necessity for hand washing before and after injection practice, necessity for wearing gloves during injection practice, no reuse of used syringes and needles, appropriate use of safety boxes was very high as above ninety percent while awareness on possible causes of NSI, use of dry cotton for cleaning injecting area was very low as below twenty percent. (Table 2)

Level of awareness on injection safety: The study revealed that more than half (57.7%) of the nurses had good level of awareness on injection safety. However 29.1% of them had average and 13.2% of them had poor level of awareness on injection safety. (Table 3)

Exposures to needle stick injury: The study showed that seven-out of-ten nurses (71.8%) experienced needle stick injury within last twelve months. Recapping was the single most common cause for NSI for more than half nurses (55.1%). Of the 71.8% nurses exposed to NSI; only one (0.6%) nurse was transmitted a disease. Even seven-out of-ten were exposed to NSI; few were applied immediate preventive measures (17.1%), administrated tetanus toxoid (15.2%) and reported to hospital administration (16.5%). (Table 4)

Self reported practices on injection safety: Most of the nurses were practicing recapping (94.1) and only very few (5.9%) reported that they never practiced recapping. Similarly some nurses (28.2%) were reported that they were practicing reuse of same syringe and needles for the subsequent use of same patient. About half of the nurses (48.6%) were practicing bending which might be another frequent cause for NSI. The study showed only about one-third (32.7%) and two-third (63.2%) nurses always wear gloves and wash hands proceeding injection practice respectively. (Table 5)

Injection safety practice based on observation: During observation it is found that only 2 (6.2%) nurses wore gloves while providing injection. Only 5 (15.6%) nurses washed their hands before while 22 (68.8%) washed their hands after providing injection. Out of 32; 29 (91.6%) practiced recapping after providing injection. No nurses were involved in bending the needles but only 22 (68.8%) the nurses disposed the syringe and needle properly in safety box/puncture proof container.

Association of NSI with different variables: The study showed that work experience and awareness level of nurses were significantly associated with needle stick injuries (p -value <0.05) but nursing qualification and training on injection safety and regular supervision by nursing administrator were not statistically associated with needle stick injuries. (Table 6)

Table 1: Description of study population (n=220)

Variables	n	%
Current age in years		
< 20	7	3.2
20-24	150	68.2
25-29	34	15.5
30-34	14	6.4
≥ 35	15	6.8
Nursing qualification		
Auxiliary Nurse Midwife	45	20.5
Staff Nurse (PCL Nursing)	147	66.8
PBN/BScN and above	28	12.7
Work experience in years		
0-4	183	83.2
5-9	18	8.2
≥10	19	8.6
Training on injection safety		
Received	67	30.5
Not received	153	69.5
Immunization against HBV		
Immunized	169	76.8
Not immunized	51	23.2

Table 2: Awareness on injection safety (n=220)

Awareness on	n	%
Diseases transmitted by NSI	87	39.5
Possible causes of NSI	31	14.1
Measures to be taken after NSI	83	37.7
No recapping of needles after use	72	32.7
Hand washing proceeding injection	213	96.8
Use of gloves proceeding injection	204	92.7
Appropriate disposal after use	89	40.4
No bending of needles after use	147	66.8
No reuse of used syringes or needle	218	99.0
Appropriate use of safety boxes	212	96.4
Use of dry cotton for cleaning area	40	18.2
Preventive measures for NSI	174	79.1

Table 3: awareness level on injection safety(n=220)

Awareness level	n	%
Good	127	57.7
Average	64	29.1
Poor	29	13.2

Table 4: Exposure to Needle Stick Injury (n=220)

Variables	n	%
Frequency of NSI		
Not at all	62	28.2
At least one time	53	33.5
Two-five times	90	57.0
> Five times	15	9.5
Cause for NSI (n=158)		
Recapping needles	87	55.1
Lack of precaution in IV inserting	39	17.7
Hasty works	17	10.8
Inappropriate handling syringes	61	38.6
Lack of precaution in drawing blood	25	15.8
Diseases Transmitted due to NSI (n=158)		
Transmitted	1	0.6
Not transmitted	219	99.4
Applied preventive measures (158)		
Applied	27	17.1
Not applied	131	82.9
Administered T.T vaccine (n=158)		
Administrated	24	15.2
Not administrated	134	84.8
Reported NSI to institution (n=158)		
Reported	26	16.5
Not reported	132	83.5

Table 5: Injection safety practice (n=220)

Variables	n	%
Recapping needles		
Always	126	57.3
Frequently	46	20.9
Sometimes	35	15.9
Never	13	5.9
Reusing the same syringes and needles		
Always	5	2.3
Frequently	7	5.5
Sometimes	50	22.7
Never	158	71.8
Bending of the needles or syringes		
Always	34	15.5
Frequently	16	7.3
Sometimes	57	25.9
Never	113	51.4
Washing hand proceeding injection		
Always	139	63.2
Frequently	43	19.5
Sometimes	34	15.5
Never	4	1.8
Wearing gloves proceeding injection		
Always	72	32.7
Frequently	43	19.5
Sometimes	74	33.6
Never	31	14.1
Using dry cotton for cleaning area		
Always	146	66.4
Frequently	12	5.5
Sometimes	36	16.4
Never	26	11.8

Using of safety box to collect syringes		
Always	139	63.2
Frequently	56	25.4
Sometimes	13	6.0
Never	12	5.4
Disposing appropriately		
Always	122	55.5
Frequently	79	35.9
Sometimes	9	4.1
Never	10	4.5

Table 6: Association of needle stick injury with different variables

Variables	Incidence of needle stick injury			Chi-square	P-value
	Yes	No	Total		
Academic qualification in nursing					
Auxiliary nurse midwife	32 (71.1)	13 (28.9)	45	2.112	0.348
Staff Nurse (PCL nursing)	109 (74.1)	38 (25.9)	147		
BN/BScN and Above	17 (60.7)	11 (39.3)	28		
Work experience					
0-4 years	133 (72.7)	50 (27.3)	183	8.270	0.016*
5-9 years	16 (88.9)	2 (11.1)	18		
≥ 10years	9 (47.4)	10 (52.6)	19		
Training on injection safety					
Received	51 (76.1)	16 (23.9)	67	0.881	0.348
Not received	107 (69.9)	46 (30.1)	153		
Regular supervision					
Yes	103 (73.6)	37 (26.4)	140	0.585	0.444
No	55 (68.8)	25 (31.2)	80		
Level of awareness					
Good	95 (74.8)	32 (25.2)	127	6.665	0.036*
Average	48 (75.0)	16 (25.0)	64		
Poor	15 (51.7)	14 (48.3)	29		

*Statistically significant

Figure in parentheses shows percentage

DISCUSSION

This study found seven-out of ten (69.5%) had not received training on injection safety. The finding of this study is consistent with studies conducted in Ethiopia [12] (66.9%) and in Bangladesh [13] (73%). Many studies [1,2,14-17] highlighted that the less attention provided in training in developing countries were associated with needle stick injuries. Vaccination against Hepatitis B among the nurses in this study was slightly lower (76.8%) than studies conducted in Pokhara [8] (82.3%), Rawalpindi [10] (82.7%) and Karachi [18] (93%). Special attention must be provided to establish provision of HBV immunization to all the employees.

Finding of this study revealed that only 31.8% nurses were aware on no recapping after giving injection which is about half of a study conducted in Surat [11] in 2011 (64%). As various studies [14-17] suggested recapping as a one of the contributing factors for NSI. Self reported questionnaire showed that about all the nurses (96.8%) were aware on hand washing proceeding injection practice in this study but a study conducted in Kathmandu [19] showed only 72.9% were aware on it. This study indicated 92.7% nurses were aware on use of gloves while giving injections which slightly lower when compared with the study conducted in

Surat, India [11] in 2011 where all nurses were aware on it but much more higher than a study conducted in Kathmandu [19] (66.1%). Nearly all (96.4%) nurses were aware to discard the used syringe and needle in a puncture proof container/safety box whereas in a study conducted in Nigeria [14], about three-fourth (76.1%) nurses were aware about it. This study showed majority of nurses (79.09%) were aware about preventive approaches of NSI which is comparatively lower with the study conducted among nurses in East Gojjam Zone Health Institutions, Ethiopia [12] (91.9%). CDC report also suggests that 76% of NSIs can be reduced by the use of safety engineered devices [8].

NSI is an important cardinal indication of poor injection safety practices by health workers [4]. However, this study found that (71.8%) nurses exposed to NSI similar to a study conducted in tertiary care teaching hospital, Pokhara [8] (70.79%). But it is lower than a study conducted in a tertiary care hospital of India [15] (80.1%). This high rate of exposure to NSI is due to maximum practice of recapping. The risk of transmission of blood borne disease due to NSI is high among all health care workers. Only 0.6% nurses reported transmission of blood borne disease which is much consistent with a study conducted in tertiary level hospital in Kathmandu [19] (0.8%). Only few (17.1%) nurses applied

preventive measures after getting NSI where in a study conducted in Khanevedeh Hospital in Tehran [16] shows 5.6% nurses applied it. Reporting of NSI to administration in this study showed only 16.5% which was 9% in Karachi [10]. It is essential to report all NSI to the hospital administration.

Self reported practice found that 94.1% used to practice recapping which was 91.4% during observation. A study based on self reported practice conducted in Western Regional Hospital Pokhara [8] showed 69.91% nurses practiced it. This high rate of recapping shows that health workers need training on injection safety [14-17]. Majority (85.9%) of the nurses mentioned that they used to wear gloves during injection practice but during observation only very few nurses (6.2%) practiced it. Similar observation done in a hospital in Kathmandu [19] showed only (4.2%) HCWs practiced it. In this study, 63.2% nurses mentioned that they used to wash their hands before and after giving injection but during observation it is found that only 15.6% nurses washed their hands before and 68.8% washed their hands after injecting.

The study found 28.2% nurses practiced reuse of same syringe and needle for subsequent use for same patient which was far lower than a study conducted in Kathmandu [19] (89%). But observation of 32 nurses, it found that no nurses were involved in the practice of using same syringe and needle for the multiple patients. Self reported practice found that 15.5% always used to practice of bending needles after giving injection but observation found that no nurses were involved in such practice. Self reported practice found that 63.2% always used to practice of collecting syringe and needles in safety box which was slightly higher (68.8%) in observation.

In this study, significant association was observed between NSI and work experience (p value 0.021) which is consistent with studies conducted in Pakistan [20] Tehran [16], Ethiopia [12] and India [21].

CONCLUSION

The study concluded an immediate training and awareness programme on injection safety to all the nurses as it increases the awareness and reduces the high rate of needle stick injuries reducing the unsafe practices like reusing, recapping, bending, inappropriate collection and disposal syringe and needles. Similarly it will increase the awareness about the importance of hand washing and wearing gloves for injection safety. There should be provision of vaccination against hepatitis B to all employees in every hospital. Early preventive intervention and reporting of NSI to hospital administration should also be essential part of injection safety.

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