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Knowledge and Preventive Practice of Occupational Health Hazards among Nurses in different Teaching Hospitals

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Abstract:- ***Introduction/ Objective:*** *Occupational health hazards are recognized as global problems for health care workers and especially among the nurses as they are often the first health care provider. It is increasing day by day due to change in science and technology and is quiet high in developing countries. This aim of the study was to find the knowledge and preventive practice of occupational health hazards among the nurses.*

Methods: *A descriptive, cross sectional study was carried out among 339 nurses working in three different teaching hospitals of the Kathmandu from February 28, 2016 to March 28, 2016 using multistage random sampling technique. A self-administered questionnaire was used to collect the data.*

Results: *The study findings revealed that the mean knowledge score was 26.7±7.3. The level of knowledge of occupational health hazards among the nurses was 68.1% (adequate knowledge). The knowledge was statistically significant with education (OR = 3.47, CI: 2.15-5.59 and p value 0.00). The mean practice score was 7.6 ±3.1.The level of preventive practice on occupational hazards was 25.4% (poor practice). The practice was statistically significant with age (OR=2.01, CI = 1.21-3.35 and p = 0.006); designation (OR= 3.08, CI= 1.42-6.69 and p = 0.003); work experience (OR=1.87, CI= 1.13-3.07 and p = 0.01); previous in-service education/ training (OR=2.25; CI= 1.02-4.92 and p = 0.03).*

Conclusion: *Overwhelmingly, nurses had adequate knowledge but poor preventive practice indicating higher risk of occupational hazards hence training and in-service education, adequate provision of personal protective equipments and establishment of effective occupational health program for nurses are needed to encourage them adhere to good preventive practice.*

Keywords: *Occupational health hazards, Nurses, Knowledge, Practice*

Introduction:

Occupational Health is an emerging discipline of health and has been considered as an integral part in the working places and nursing is a uniquely hazardous occupation. Some potential hazards include biological hazards, physical hazards, toxic chemicals, needle stick injuries (1). The key safety issues impacting this work include needle stick injuries, workplace violence, and musculoskeletal injuries related to patient handling, workload. These issues are important not only for nurses themselves, but also because they contribute to work force shortages by prompting nurses to leave them (2).

The vast majority of nurses experience persistent job-related pain. In a study in Iran, 89% of nurses reports musculoskeletal pain (3). Similarly 78% of nurses were suffering from Low Back Pain in Nepal (4). Communicable and contagious diseases and exposure to blood-borne pathogens due to needle-stick injuries also threaten the health of nurses. It is estimated that 600000 to 800000 needle-stick injuries occur each year in all healthcare settings (5)**.**The prevalence of needle stick injury is (80%) in Nepal (6). Nurses, especially in emergency department, continue to experience high rates of on-the-job violence. A study shows, 53.4% of

nurses reported experiencing verbal abuse and more than one in ten (12.9%) reported experiencing physical violence (7). A study in kaski district of Nepal revealed 40.30% respondents have faced some form of sexual harassment, verbal harassment being the most common form all abuse (8).

Nurses are much vulnerable as studies have shown that an occupational hazard is quite high among nurses as they are front line care taker. Occupational hazards are poorly recorded as job related, because nurses donot usually report the incidents on duty except for those, which are prominent as needle prick injuries. Therefore knowledge of occupational hazards plays a key role in prevention of hazards so the study aims to assess the knowledge and preventive practice of occupational hazards among the nurses

Material and methods:

A descriptive cross-sectional study design was used among nurses working in 3 teaching hospitals of Kathmandu, namely Tribhuvan University Teaching Hospital (TUTH), National Academy of Medical Science (Bir Hospital), Kathmandu Medical College Teaching Hospital. The study population consists of 368 nurses working in different wards of three hospitals with work experience of at least one year from February 28, 2016 to March 28, 2016.

Data was collected through the self-administered questionnaire developed by the researcher based on the guidelines for protecting the safety and health of health care workers by National Institute for occupational safety and health (NIOSH).The content validity of the questionnaire was assessed by experts. The reliability of practice score was assessed by using Cronbach's alpha. The value for practice was 0.71.

The collected data were entered into an Excel spreadsheet and then transferred to Statistical Package for Social Science (SPSS) version 16 for analysis. Descriptive statistics (mean, range, percentages and standard deviation) were used to describe the quantitative and categorical study variable. Normality test was done using sapiro wilk test to find out the distribution of the data based on this inferential statistics as odds ratios was used to measure the strength of association between the categorical study and outcome variable. A p value of < 0.05 and 95% confidence interval were used to report the statistical significance and precision of the estimates. References and citation were managed with mendeley software version 1.15.2.

Results:

Out of 368 questionnaire distributed only 339 questionnaire were completed and returned. The non-response rate in the study was 8%.

Socio-demographic Characteristics of the Nurses

The mean age was 28.1.Regarding the marital status 51.6% was married. PCL nursing accounts for 42.5% in the education level and 79.1% were immunized against HBV. Majority (91.4%) of the nurses were staff nurse. Only 25.7% of nurses was from critical care unit and least (9.7%) of the nurses were from emergency. The mean duration of work experience was four years. About 35% have experienced occupational hazards for which 72.5% of nurses experienced needle stick injury.

Table 1: **n=339**

Socio-demographic Characteristics	Number	Percentage
Age in completed years		
20-29	247	72.9
30-39	63	18.6
40-49	19	5.6
50-59	10	2.9
Mean age ± Standard deviation	28.17±6.83	
Range	20-58	
Marital Status		
Single	164	48.4
Married	175	51.6
Education		
PCL Nursing	144	42.5
BN/BNS	139	41
BSc. Nursing	55	16.2
MN/ M.Sc. Nursing	1	0.3
Immunizations against HBV		
Immunized	268	79.1
Not Immunized	71	20.9

Table 2: Professional Characteristics of the Nurses **n=339**

Professional Characteristics	Number	Percentage
Designations		
Staff Nurse	310	91.4
Nursing Officer	29	8.6
Working Departments		
Medical	83	24.5
Surgical	77	22.7
Critical care unit	87	25.7
Operation theater	59	17.4
Emergency	33	9.7
Work Experience in Years		
1-5	197	58.1
6-10	91	26.9
11-15	27	7.9
16 and above	24	7.1
Mean	4	
Range	1-37	
Previous In-Service Education/ Training		
Yes	29	8.6
No	310	91.4
Name of In-Service Education/Training (n=29)		
Infection Prevention	28	96.6
Hand Washing	1	3.4
Significant Previous Health Hazards		
Yes	120	35.4
No	219	64.6
Name of Health Hazards Experienced (n=120)		
Needle stick injury	87	72.5
TB	10	8.3
Work related musculoskeletal disorder	23	19.2

TABLE 3: Knowledge of Occupational Health Hazards: Physical Hazards

Occupational Health Hazards	No. of correct response	Percentage
Physical Hazards	2248	73.6
Chemical Hazards	1510	74.2
Biological Hazards	3465	68.1
Psychosocial Hazards	1671	70.4
Guidelines	166	24.48

Mean knowledge score and standard deviation: 26.7±7.3
Range of knowledge score: 5-39

TABLE 4: Respondents Level of Knowledge of Occupational Health Hazards

Level of knowledge	Frequency	Percent
Adequate knowledge	231	68.1
Inadequate knowledge	108	31.9
Total	**339**	**100.0**

TABLE 5: Preventive practice of Occupational Health Hazards

n=339

Items	No. of correct response	Percentage
Give attention to correct body mechanics.	142	41.9
Report work related musculoskeletal disorder	49	14.5
Wear gloves when conducting any procedure	256	75.5
Wash hand after any procedure	293	86.4
Wash hand after taking care of patient	277	81.7
Wear facemask whenever there is possibility of a splash.	233	68.7
Wear gown/apron if soiling with blood or deep body fluid is likely	169	49.9
Don't recap the needle after giving an injection	212	62.5
Put used needles or scalpels in puncture proof box	307	90.6
Report needle stick injury	217	64.0
Report incidents of work place violence including the minor ones	119	35.1
Provided with the best available personal protective equipment.	77	22.7
Usually have enough time to take safety precautions while completing duties	73	21.5
Work areas are periodically inspected to identify potential health and safety hazards	38	11.2
Supervisor talks about safe work practices	64	18.9
Taught by senior staffs and supervisor how to recognize and deal with incidents of workplace violence.	67	19.8

Mean practice score ± SD: 7.6±3.1
Range of practice score: 0-16

Table 6: Level of Practice on Prevention of Occupational Health Hazards

Level of Practice	Frequency	Percent
Good Practice	86	25.4
Poor Practice	253	74.6
Total	**339**	**100.0**

Table7: Association between Level of Knowledge on Occupational Health Hazards with Socio-demographic and Professional Variables

Demographic variable	Level of knowledge		Odd Ratio	95% CI	p value
	Inadequate n (%)	Adequate n (%)			
Age					
≤ 28	74(31.8)	159(68.2)	0.98	0.60-1.61	0.95
Above 28	34(32.1)	72(67.9)	1	Ref	
Marital Status					
Married	59(33.7)	116(66.3)	1	Ref	
Single	49(29.9)	115(70.1)	1.19	0.76-1.89	0.45
Education					
Undergraduate	68(47.2)	76(52.8)	1	Ref	
Graduate & above	40(20.5)	155(79.5)	3.47	2.15-5.59	**0.00***
Immunizations against HBV					
Not immunized	29(40.8)	42(59.2)	1	Ref	
Immunized	79(29.5)	189(70.5)	1.65	0.96-1.93	0.05
Designations					
Staff Nurse	103(33.2)	207(66.8)	1	Ref	
Nursing Officer	5(17.2)	24(82.8)	2.39	0.89-6.44	0.07
Working Departments					
Special ward	50(34.2)	96(65.8)	1	Ref	
General ward	58(30.1)	135(69.9)	1.21	0.76-1.92	0.41
Work Experience					
1-6 years	73(34.0)	142(66.0)	1	Ref	
6 years and above	35(28.2)	89(71.8)	1.30	0.80-2.11	0.27
Previous In-Service Education/ Training					
No	102(32.9)	208(67.1)	1	Ref	
Yes	6(20.7)	23(79.3)	1.88	0.74-4.76	0.17
Previous Health Hazards Experienced					
No	76(34.7)	143(65.3)	1	Ref	
Yes	32(26.7)	88(73.3)	1.46	0.89-2.39	0.12

Pearson χ^2 test; significant level at < 0.05

Table 8: Association between Level of Prevention of Occupational Health Hazards with Socio-demographic Variables and Professional Variables

n=339

Demographic variable	Level of Practice		Odd Ratio	95% CI	p value
	Poor n (%)	Good n (%)			
Age					
≤ 28	184(79)	49(21)	1	Ref	
Above 28	69(65.1)	37(34.9)	2.01	1.21-3.35	**0.006***
Marital Status					
Single	129(78.7)	35(21.3)	1	Ref	
Married	124(70.9)	51(29.1)	1.51	0.92-2.48	0.09
Education					
Undergraduate	113(78.5)	31(21.5)	1	Ref	
Graduate & above	140(71.8)	55(28.2)	1.43	0.86-2.37	0.16
Immunizations against HBV					
Not immunized	53(74.6)	18(25.4)	1	Ref	
Immunized	200(74.6)	68(25.4)	1.00	0.54-1.82	0.99
Designations					
Staff Nurse	238(76.8)	72(23.2)	1	Ref	
Nursing Officer	15(51.7)	14(48.3)	3.08	1.42-6.69	**0.003***
Working Departments					
General ward	151(78.2)	42(21.8)	1	Ref	
Special ward	102(69.9)	44(30.1)	1.55	0.94-2.53	0.07
Work Experience					
1-6 years	170(79.1)	45(20.9)	1	Ref	
6 years and above	83(66.9)	41(33.1)	1.87	1.13-3.07	**0.01***
Previous In-Service Education/ Training					
No	236(76.1)	74(23.9)	1	Ref	
Yes	17(58.6)	12(41.4)	2.25	1.02-4.92	**0.03***
Previous Health Hazards Experienced					
No	166(75.8)	53(24.2)	1	Ref	
Yes	87(72.5)	33(27.5)	1.18	0.71-1.97	0.50

Pearson χ^2 test; significant level at < 0.05

Discussion:

Knowledge and Practice of Occupational Health Hazards

In the study mean knowledge score was 26.7 ± 7.3. Majority (92%) of the nurses were aware about the physical hazards and 62.5% have knowledge that musculoskeletal disorders that cause the occupational health hazards and similar findings where 95%of the nurses are aware about physical hazards can be trace from the study awareness of occupational hazards among nurses by (1)

Regarding the chemical hazards majority 91% of the nurses have knowledge regarding the chemical factors and different chemicals that cause occupational health hazards and findings is consistent with the study chemical occupational risks identified by nurses in a hospital environment by Xelegati, Robazzi, Marziale, & Haas (9) and in study the status of occupational safety among health service providers in hospitals in Tanzania (10).

Majority (85%) of the nurses have knowledge about post exposure prophylaxis which is similar to findings in Sayami & Tamrakar (6) however regarding the post exposure prophylaxis for HIV should be started within 72 hours 66 % of the nurses were aware about it which is contradictory to the same study (37.8%) and it may be in the current study nurses were more aware about when PEP for HIV in comparison to other health care workers which were included in that study. This study shows majority (89%) of the respondents know that psychosocial factors can cause occupational health hazards and regarding the prevention of workplace violence most (70.5%) of nurses said monitoring and intervention is needed and similar type of findings is seen in study of workplace violence (11)

In 1985, in order to increase awareness among health care workers of the dangers of sharp injuries and other types of disease transmission, the Centers for Disease Control and the Occupational Safety and Health Administration (OSHA) in the United States introduced the "Universal Precaution Guidelines," which have become the worldwide standard in both hospital and community care settings. This study shows 24.5% of the nurses have knowledge regarding the guidelines on prevention of occupational hazards out of which 21.7% of the nurses knows about universal precaution guidelines.

The mean practice score was 7.6±3.1. In this study 42% of the nurses give attention to correct body mechanics however the study findings by P et al., (2014) on the knowledge and practice of body mechanics shows majority (88%), of the subjects had average practice of body mechanics, followed by 12 percent had good practice of body mechanics.

Regarding hand washing practice majority 86.4% wash the hand after any procedure and 81.7% wash hand after taking care of the patient. Similarly 68.7% wear facemask and 49.9% wear gown/apron if soiling with blood or body fluid is likely. The findings is consistent with (13) with hand washing and contradictory to use of facemask and gown which revealed 87.7% and 79.3% . The condradictory findings in the study may be due to less availability of the personal protective equipments.

Only 22.7% of nurses said they were provided with best possible protective equipment and this is one of the major factors for poor practice and it is evident by the study done in kuwalalampur (14) that using all neceassry personal protective equipment was associated with reduced exposure to hazards. Indeed availability of personal protective equipment has for long been recognized as imporatnt important infection control measures in health care industry. The recapping of needles has been prohibited under the OSHA and in this study 62.5% donot recap the needle after giving the injection and this finding was supported by the study needle sick injuries among health care professionals in tertiary hospital where 63% of the respondent's donot recap similarly 90.6%. of the respondents put used needle in puncture proof box and similar finding of 93.3% were reported from the same study(6) .

Regarding the reporting behavior 64 % of the nurses reports needle stick injury, 35 % of the nurses reports workplace violence including minor one and only 14.5 % of the nurses report work related musculoskeletal disorder, and. The reporting behavior was high for needle sick injury compared to work place violence and work related musculoskeletal disorder. Although a large proportion of nurses suffer from work related injury/illness, many didn't report their injuries/illness this has been notes as significant problem in study conducted by Decastro etal (15). The reporting rate of injuries among healthcare employees in the present study was low which can be due to the lack of awareness of the necessity for reporting or the lack of knowledge of and familiarity with the procedure

The findings of the study demonstrate adequate level of knowledge among the nurses and poor practice of occupational health hazards and consistent findings was found the study by (Aluko et al., 2010 ; Sreedharan,

Muttappallymyalil, & Venkatramana, 2010) (16)(18)

Association of Socio demographic and Professional Variables with Knowledge and Practice on Occupational Health Hazards

This study shows significant association of knowledge with educational status. Nurses who were graduated and above had significantly higher ORs of adequate knowledge than who were undergraduate in agreement with the findings of Aluko et al., (2016) where it concluded that the level of education influences the health and safety issues. This meant that those with high knowledge will translate the positive attitude and subsequently good behavior.

Nurses who were vaccinated against HBV were more likely to have adequate knowledge then who weren't however though it was not statically significant. The rationale behind good knowledge could be in Nepal vaccination of the health care workers including nurse is not covered by the government; Nurses who wish to be vaccinated receive vaccination from the private clinic and pay from their own pockets. Therefore we could assume that those who are willing to pay for vaccine might be more aware of occupational health hazards.

Nurse who had work experience of more than 6 years significantly have high ORs of having good practice and was statistically significant p=0.006. A study of knowledge and practice of universal precaution in Afghanistan is consistent with the findings which shows 7 and more have good practice which was also statistically significant p=0.02. So it can be concluded that nurses who had been at their jobs for more years have good preventive practice.

Regarding the working department nurses working in special ward have good practice than working in general ward and though not statistically significant this may be due to availability of personal protective equipment more readily in special ward than in general ward as personal protective equipment is one of the major factors for poor practice and it is evident by the study by Rawalane. N. etal. (2014).

Study also showed significant association between practice and designation. Nursing officer were having 3.08 times good practice compared to staff nurse p= 0.003 however there is no supporting study to support the findings of the study. Nurses who receive in service education /training adhere to good practice than who donot receive the training therefore training and in service program needs to be in cooperate to improve the practice and prevent occupational health hazards.

Conclusion:

Study concluded that there was adequate knowledge and poor practices. The high level of knowledge demonstrated by respondents was at variance with practice indicating higher risk of occupational health hazards among nurses therefore, adequate provision of personal protective equipment and establishment of an effective occupational health program should be made. These findings suggest that appropriate pre service and in service education and training is needed for the nurses is encourage them to apply good practice in accordance with increase knowledge of occupational health hazards.

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