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Surveillance of Needle-Stick Injuries amongst Student Nurses at Institute of Nursing Dow University of Health and Sciences Karachi

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Abstract: **Introduction: Needle-stick injury (NSI) have the impending to affect a student nurse's life and leading reason of Hep B, Hep C and HIV which cause to illness especially among nurses all over the world[1.] The aim of this study was to define the prevalence of NSIs among student nurses in Institute of Nursing DUHS. Methodology: From May 2016 to July a cross sectional study was accompanied in student nurses at Institute of Nursing DUHS. 150 student nurses participated with using convenience sampling technique. The data was analyzed by using SPSS version 16. For analysis and comparison and Proportions of the categorical variables were symbolized in numerous statistical data. Logistic regression used to find association between enrolled program, gender and NSI among student nurses.Result: The prevalence of NSI in our study is 33.7%. In female prevalence of NSI was 19.1 %(13/68) and in male it is 45.1 % (37/82). The prevalence of NSI according to different programs in MSN student's had 42.9 % (12/28), as Post RNBSN 31.1 %(14/45) and 31.2% (24/77). There is significant relationship between gender and NSI. The OR of gender is 0.28 with CI 95% . There is no significant relationship between enrolled program and NSI. Conclusion: NSI is the most important occupational health hazard in nurses. It is important to implement strategies for spreading awareness and effective preventive measures against incidences of NSI.**

Keywords: **DUHS, Needle sticks injuries, Student nurses.**

I. INTRODUCTION

Needle stick injury accidently change student nurses life globally which is leading cause of hep B , Hep C and HIV .Even though many studies have been done in developing countries than developed countries [1] needle stick injury means to introduce potential hazardous substances into the body of the health care worker by piercing stab wound during the performance of their duties by the sharp instruments such as needles lancets, scalpels, and contaminated broken glass. [2]

It is major occupational health and safety issue worldwide faced by the health care.[3] Approximately 35 million health care workers is confronting a percutaneous injury every year. [4] In the United States each year health care worker got injury through needles sharps about 385000 reported by disease control and prevention centre[5].

Nurses are more prone to get injury among health care workers .[6] Currently it is predicted in USA 16.3 percent nurses have the incidence of needle stick injury [7], in the united kingdom about 48 percent nurses reported needle stick injury or sharp injury during caring of the patient in their careers ,One in ten respondents (10%) had been stuck by a needle or sharp in the last year. [8] and in Australia reported 13.9 percent of needle stick injury.[9]

Needle stick injury is an alarming situation in developing countries. One study f injection safety was conducted in in Saudi Arabia that shows 14.9percent physician and 16.5 percent of nurses had needle stick injuries.10 Recently survey was conducted in India , 296 health care workers reported about needle stick injuries that was 28.4 percent in nurses , 9.1 percent in nursing interns and 21.6 percent in doctors and 15.9 percent in medical interns.11 Reported incidence of needle stick injuries in Pakistan is 0.29 percent in consultants , 24.5 percent in trainees , 44.7 percent house officers and 16.3 percent in nurses.[12]

The magnitude of consequences of needle stick injuries in Pakistan might be assessed by another research that was held in personnel operation room which shows four times more needle stick injuries [12]. In each year is 58.8 percent, 36.8% one to three needle-stick injuries per year, while 4.4% reported no needle-stick injury in the last five years. [13] that is alarming situation for nurse educators to develop the safe environment in clinical setup for the student nurses to prevent from the major issue of the needle stick injuries , not only providing safe environment also need of amendment in curriculum.

Needle stick injury is a potential cause of changing nurse's life that is yet unreported in many clinical areas, this may evolve at the time of evaluation of curriculum, hence probably threats of nursing education overlooked. Moreover, needle stick injury is a preventable occupational health threat. [14, 15]

There has been no information available on the prevalence of needle-stick injuries occurs among student nurses at Institute of Nursing in Dow University of health sciences. The primary objective is to analyze the prevalence of NSI among student nurses in Institute of Nursing Dow University of Health Sciences. Secondary objectives are to determine association between the program levels, gender and needle stick injury.

II. METHODOLOGY

From May 2016 to July 2016, a cross sectional study was accompanied in student nurses at Institute of Nursing DUHS. 150 student nurses participated with using convenience sampling technique. The data was analyzed by using SPSS version 16. For analysis and comparison and Proportions of the categorical variables were symbolized in numerous statistical data. Logistic regression used to find association between enrolled program, gender and NSI among student nurses. Written permission was reserved and, student nurses of Generic BSN (semester I and II) were not included because they are not performed medication. Structured Questionnaire used to collect data.

SAMPLE SIZE:

Using Open Epi sample size calculator, the sample size was calculated to be approximately 219 with prevalence 71.9(with Confidence Level (CL) of 95%.we collected 150 student data due to shortage of time.

DATA ANALYSIS:

Data analyzed by using SPSS-16. For analysis, comparison and Proportions of the categorical variables was calculated and signified in numerous statistical data forms. Data including independent variable such as age, gender, enrolled program, practices, and dependent variable such as sustained needle stick injury last 12 months were presented in the form of frequencies and percentages. Logistic regression was used to find association between enrolled programs; gender and needle stick injury among student nurses with P value of 0.05 as significant.

OPERATIONAL DEFINITIONS:

Needle Stick Injury:

Needle stick injury means to introduce potential hazardous substances into the body of the health care worker by piercing stab wound during the performance of their duties by the sharp instruments such as needles lancets, scalpels, and contaminated broken glass.[2]

Student nurses:

A student of Institute of nursing DUHS in a program leading to degree in a form of nursing; usually applied to students in Post RN, Generic BSN and MSN program and having their clinical.[5]

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DATA COLLECTION PLAN:

A self-prepared form was used after taking consent. Data collected after permission of director of Institute of Nursing Dow University of Health Sciences. Data which obtained was taken confidential and results of study will share with participants through publication.

III. RESULTS

The outcomes of this survey presented the prevalence of needle stick injuries in student nurses and the incidence of injury in student of different programs of nursing. We also analyze the result as their gender. Out of 150 student nurses 82 (54.7%) were male and 68(45.3) were female. Participants were selected from three different programs. From MSN28 (18.7%), Post RNBSN 45(30%), Generic BSN 77(51.3%). the result shows that 150(100%) participant clinical exposure. The mean age of participants was 28.24. (Table 01)

In table 02 the result shows that 136(90.7%) participant have administered injections in their clinical. 128(85.3%) student nurses assisted in the removal or disposal of needles. 104(69.3%) had practice of recapping the needle. In our study 50 students sustained a needle stick injury during the last 12 months, so the prevalence of needle stick injury in our study is 33.7%. Student nurses who was fully immunize against Hepatitis B were 115(76.7%). Only 90(60%) had trained regarding precautions and/or handling of needle stick injury. Through the past two years 71(47.3%) have gone through a copy of the hospital's Health & Safety policy on the safe and ethical removal of clinical trash. 86(57.3%) response that there is any policy in their department concerning needle stick injury. If they need to separate a needle from a syringe 85(56.7%) separate it with hands, and 40(30.7%) separate it with forceps. When disposing of a sharps box 97 (64.7%) wait until it is ¾ full and 53(35.3%) wait until completely full.

Figure A and B show the prevalence of needle sticks injury in both gender and enrolled program. In female prevalence of needle stick injury i.e. 19.1 %(13/68) and in only male it is 45.1 %(37/82). If we compare the incidence of needle stick wound according to different programs then the MSN student's had 42.9 % (12/28), as Post RNBSN 31.1%(14/45) and 31.2% (24/77).

TABLE I: SCIO DEMOGRAPHIC DATA OF STUDENT NURSES

S.NO	SCIO DEMOGRAPHIC DATA	FREQUENCY N=150	PERCENTAGE %
I	**Age**	28.24(mean)	2.64 STD deviation
II	**Gender**		
	Male	82	54.6
	female	68	45.33
III	**Enrolled program**		
	Post RNBSN	45	30
	GBSN	77	51.33
	MSN	28	18.66
IV	**Clinical exposure** [a]		
	Yes	150	100
	No	00	00

a. Clinical exposure as a student

Table II: SUSTAINED NSI AND OTHER PRACTICES

S: NO	PRACTICES	FREQUENCY N=150	%
I	Administered injections (any form)		
	Yes	136	90.7
II	Assisted in the removal or disposal of needles		
	Yes	128	85.3
III	Ever recapped the needle		

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	Yes	104	69.3
IV	Have sustained a needle stick injury during the last 12 months?		
	Yes	50	33.7
V	Have fully immunize against Hepatitis B?		
	Yes	115	76.7
VI	Ever received training in the prevention or treatment of NSI?		
	Yes	90	60
VII	During past two years read a copy of the hospital's Health & Safety policy on the safe and ethical disposal of clinical waste?		
	Yes	71	47.3
VIII	Is there any policy in your Department regarding NSI		
	Yes	86	57.3
IX	If you need to separate a needle from a syringe, how do you do it?		
	Hands	85	56.7
	Forceps	46	30.7
	Not separated	19	12.7
X	When disposing of a sharps box wait until it is		
	¾ full	97	64.7
	Completely full	53	35.3

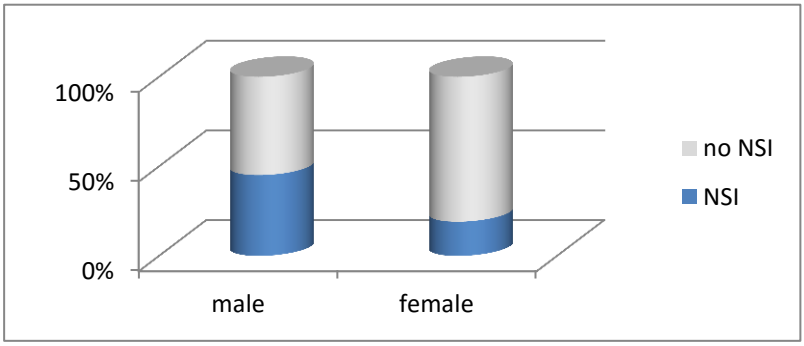

FIGURE-A SUSTAIN NEEDLE STICK INJURY DURING LAST 12MONTHS IN BOTH GENDERS

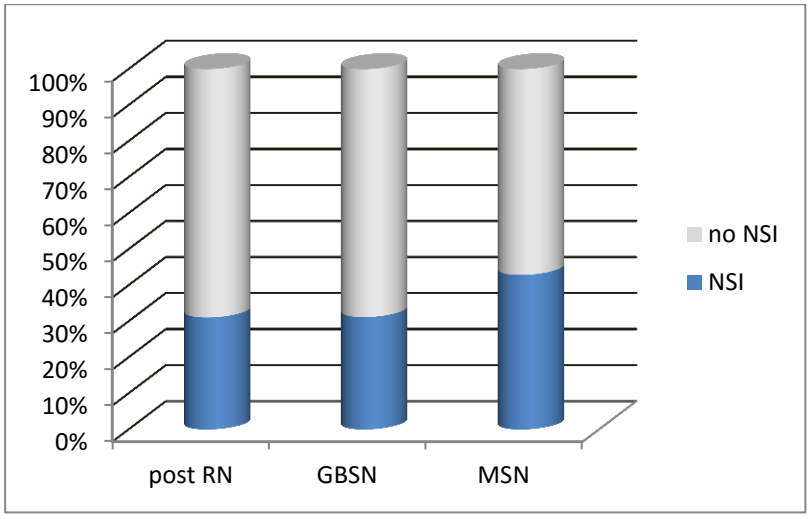

FIGURE-B ENROLLED PROGRAM AND SUSTAIN NEEDLE SICK INJURY DURING LAST 12MONTHS

TABLE -III ASSOCIATIONS BETWEEN SUSTAIN NEEDLE SICK INJURY WITH GENDER AND ENROLLED PROGRAM OF STUDENT NURSES

	OR	95% CI	P-value
Gender			
Male	0.28	0.13 - 0.6	P=0.001
female	1		
Enrolled program			
Post RN	1		
GBSN	1.1	0.48 –2.5	P=0.5
MSN	0.64	0.23 – 1.7	P= 0.8
			P=0.39

In table 03 Data shows that there is significant relationship between gender and needle stick injuries. The OR of gender male is 0.28. So males are 0.25 times more likely to sustain needle stick injuries then female and females are 0.75 times safer for needle stick injury then males. There is no significant relationship between enrolled program and needle stick injury.

TABLE IV: PREVALENCE OF OTHER PRACTICES WHO SUSTAINED NEEDLE STICK INJURY

S N	SUSTAIN NEEDLE STICK INJURY DURING LAST 12MONTHS N=50	FREQUENCY N=50	%
I	Did you report the injury?		
	Yes	25	50
II	Did you fill in an incident report?		
	Yes	21	42
III	Was there a sharps box in the room where the incident occurred		
	Yes	27	54
IV	How did the most recent incident happen?		
	Individual carelessness	24	48
	Poor disposal system	21	42
	Not any	05	10

The prevalence of other practices among those students who have persistent a needle stick injury during the last 12 months only 25(50%) had reported the injury and 21(42%) filled an incident report. 27(54%) mentioned that there was a sharps box in the room/area where the incident occurred. 24(48%) reported that the most recent incident happen due to individual carelessness, 21(42%) reported that the most recent incident happen due to Poor disposal system but 5(10%) did not reported any reason as shown in table 04.

IV. DISCUSSION

Needle stick injuries certainly are furthermost significant work-related wounds for nurses.[16] in USA it is noticed that NSIS are 49% in nurses 10% in physicians.[17] the prevalence of needle stick injuries in developing countries is higher than developed countries, in Iran frequency of needle stick injury in nurses is 63.3%. [16] A survey w in Ghurki Trust Teaching Hospital; Lahore from October 2009 to January 2010 showed the incidence of NSI 69%. The outcome of our study has represented that 50 out of 150 student nurses (33.7%) have acknowledged that they had t needle stick injury in recent 12 months.

The majority concern with nurses are recapping injection and disposing of needles and also handling of waste. According to Mulago study that was held in national referral hospital in Kampula, Uganda, it was noticed that very crucial reasons of NSI were recapping needles and handling needles short of wearing gloves.18 Our survey outcome indicated 69.3% student nurses recapping the needle and got needle stick injury accidentally. Recapping of needles are strictly prohibited in order to overcome the threats of transmission of blood borne pathogens as mentioned by USA OSHA's blood-borne pathogen standards (1996).[20]

Less recording of NSI is similarly a chief problem. According to our survey 50% of the needle stick nurses specified it to top management and about 42% student had completed the incidence report which has better as related to recognized rate of 7% in other reports published earlier by Alam.[21].

Around 60% of the nurses (46 out of 77) had acknowledged training in the prevention and/or treatment of needle stick injury while in another private setting of Pakistan, 88% of Aga Khan University nursing school graduates have received sharp management course.[19] The accessibility of sharps box in the room/area where the incident happened in our study was 54%. While 48% student nurse believed that the most recent injury happened due to individual negligence and 42% student nurse accepted that the most recent injury happened due to poor disposal system.

In our subjects 76.7% had been vaccinated against HBV while 23.3% were still un-vaccinated and prone to get infected. Predictable commonness of Hepatitis B in our population is 3–4% and Hepatitis C is 6%. This information suggests that a considerable number of Health Care Workers are at probable risk of infections with blood borne pathogens after a needle stick injury.[22, 23] Needle stick injuries and their associated biological hazards thus are one of the most important unseen harms in the health care workers.

V. CONCLUSION

Needle stick injury is highly significant work-related health danger in nurses. It is vital to design and implement policies aimed at increasing consciousness about threats related, correct management methods and current precautionary actions in contradiction of occurrences of needle stick injuries. Infection control teams must be developed and improved in relations of working out for piercing controlling. Recording to top management have to be focused for exact valuation of the condition. Screening of student and staff nurses after needle stick injury must be encouraged and protection actions alongside must be improved by reassuring the nursing staff and students to use gloves whereas handling by sharps.

VI. RECOMMENDATIONS

It is suggested that the nurses have to alert of work-related health dangers through different awareness programs. Consistent workshops and conferences must be directed for sharp handling training. Recording of needle stick injuries must be obligatory to top management of infection controller team. All health professional must be inspires to practice gloves and needle cutters during duty. It must be compulsory for entirely nurses to be vaccinated contrary to Hepatitis B before incoming into clinical.

VII. LIMITATIONS

Only one institute included and could not assess knowledge according to their enrolled programs so result cannot generalize.

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