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Nursing students knowledge regarding needle stick injury: Effectiveness of structured teaching plan

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Abstract
WHO reports in the World Health Report 2002, that of the 35 million health-care workers, 2 million experience percutaneous exposure to infectious diseases each year. It further notes that 37.6% of Hepatitis B, 39% of Hepatitis C and 4.4% of HIV/AIDS in Health-Care Workers around the world are due to needlestick injuries. Many factors involved in transmission of infections due to needle stick injuries which includes overuse of injections, lack of supplies of disposable syringes, safer needle devices, sharps disposal containers, passing instruments from hand to hand while conducting any procedure, lack of awareness and adequate training. Needle stick injuries not only possess health workers at risk of getting infections but also creates an emotional impact which can be severe and long lasting. Hence there is a need of introduction of health teaching programs which can produce positive changes among nurses in knowledge towards safety procedures that can protect them by accidental blood borne pathogen transmission. A total 30 students nurses were recruited randomly. A quantitative study using Quasy experimental, one group pre-test and post-test design were used. Knowledge questionnaire developed by investigator which was used to collect data. The study findings showed that 6 student (20%) had inadequate knowledge towards needle stick injury, 24 student (80%) had moderate knowledge and none of them were having adequate knowledge level regarding needle stick injury.

Keywords: nursing students, needle stick injury, knowledge, effectiveness, structured teaching plan

Introduction

Health care workers face a wide range of hazards in the health care setting including sharp injuries, harmful exposures to chemicals and hazardous drugs and back injuries and so on. Among them the needle stick injuries are the most common occupational injuries for the health care workers. Not only the health care workers various other occupations are also at increased risk of needle stick injury including law enforcement, tattoo artists, food preparers and agriculture workers [1]. A needle stick injury is the penetration of the skin by a needle or other sharp object's which has been in contact with blood, tissue or other body fluids before the exposure and it can cause blood -borne diseases such as Hepatitis B, Hepatitis C and even AIDS. These injuries can occur at any time when people use and disposal of needles [2]. Needle stick injuries are the primary means of exposure to blood borne diseases for health care workers. The best prevention for health care providers is the consistent application of universal precautions for all clients as recommended by the centers for disease control and prevention [3]. Nurses have the highest rate of needle stick injuries among the health care workers. The risk of infection from a needle stick injury depends on the pathogen involved the immune status of the worker and severity of the needle stick injury. The probability is that a single needle stick injury will result 3-5 people have chances in 1000 people for HIV,300 chances in 1000 for Hepatitis B,20-50 chances in 1000 for HepatitisC [4] Needle stick injuries cause a high burden of death and disability among health care workers. Available statistics underestimate the severity of problem because many cases go unreported as nurses do not report their injuries. This makes it more difficult to know severity of problem and how well prevention is possible. Preventing needle stick injuries is the most effective way to protect the nurses from the infectious diseases caused by it [5]. In 2007, the WHO estimated 2 million needle stick injury injuries per year globally. And another investigation estimated 3.5 million injuries yearly [6, 7, 8] and out of this nurses are at greatest risk. According to WHO data, 35.7 million health care workers in the world are exposed to the risk of needle stick injury [9]. In India, approximately 3 million health care workers experience exposure to blood borne viruses each year out of that 66,000 HIV, 16000 HCV and 200-500 HIV virus infection occur annually [10]. Therefore, this study was aimed to assess the knowledge of nursing students regarding needle stick injury. The information obtained from this study will be used by policy makers and stakeholders to identify the awareness and right practices of nursing students in the hospitals as well as community settings.

Objectives

The objective of the study was as follows

1. To assess the knowledge regarding needle stick injury among studentnurses.
2. To determine the effectiveness of structured teaching Programme on knowledge regarding needle stick injury among studentnurses.
3. To identify the association between pre-test and post - test knowledge regarding needle stick injury among nursing students.

Materials and Methods

Quantitative study using Quasy experimental, one group pre-test and post-test design were used. A total of 30 nursing students between the age group of 17 to 22 years were randomly selected using simple random technique who were willing to participate in the study. The data collection instrument were developed by the investigators. The reliability and validity of the tool was done with the help of Nursing experts and statistician. It had two section such as (1) Demographic data, (2) Structured knowledge questionnaire. The knowledge part included the questions on the general knowledge on needle stick injury, high risk diseases transmission through needle stick injury, causes, symptoms, complication, of needle stick injury and post prophylaxis exposure, incidence report, psychological effect and disposal protocol of contaminated needles (30 questions). To complete the data a master data sheet was prepared by the investigator. Demographic data containing sample characteristic was analyzed using frequency and percentage. Knowledge score was analyzed in terms of frequency, percentage, mean and standard deviation. Chi – square test was computed for finding out the association between knowledge score with demographic variables. Institutional research committee approval was taken. Formal approval was also taken from the institutional authority of research area. The investigator introduced the self to the participants and the purpose of the study was explained to ensure better cooperation during the data collection period.

Criteria for selecting sample Inclusive criteria

1st year BSc. Nursing students who are;

- Present during the time of data collection.
- Want to participate in the study.

Exclusive criteria

1styear bsc nursing students who are;

- Absent at the time of data collection.
- Do not want to participate in the study.

Scoring criteria of the tools for assessment of knowledge

- Adequate knowledge: ≥75%
- Moderately adequate knowledge: 51%-75%
- Inadequate knowledge: <50%

Tools of Data Collection

The tool consist of two parts:

1. Demographic data profile sheet: Demographic data profile sheet was used for the assessment of demographic variables such as age, Gender, Religion, Educational status, Sources of information, previous working experience.
2. Self-structured questionnaire: Self-structured questionnaire was used to assess the knowledge on needle stick injury among nursing students of Dhanwantri College of Nursing.

Results and Discussion

Section-A

Table 1: Frequency and percentage distribution of Socio demographic characteristics of nursing students

Demographic variables		No. of mothers (f)	%
Age in years	17 - 18 years	6	20%
	19 - 20 years	21	70%
	21 - 22 years	3	10%
Gender	Male	6	20%
	Female	24	80%
Religion	Hindu	21	70%
	Christian	2	6.7%
	Muslim	7	23.3%
Educational Status	1st year	30	100%
	2nd year	0	0.0%
Sources of information	Class	25	83.33%
	Internet or Media	5	16.7%

Table 1 shows the frequency distribution of demographic variables of nursing students according to age majority of the nursing students 70% were in age group of 19-20 years, followed by 20% are fall in the age group of 17-18 years and 10% are in between 21-22 years. In terms of gender most of the nursing students are females 80% followed by males 20%. According to religion majority of the students are Hindu (70%) followed by 23.33% were Muslims, 6.7% were Christian and100% of the students were 1st year nursing students. According to sources of information 83.33% of the students got the knowledge of needle stick injury from the classes followed by 16.7% students got the knowledge from internet or media.

Table 2: Level of knowledge on Needle stick injury

Knowledge Level	Category	Classification of Respondents				χ^2 Test
		Pre test		Post test		
		N	%	N	%	
Inadequate	≤ 50% Score	6	20.0	0	0.0	40.80*
Moderate	51-75% Score	24	80.0	6	20.0	
Adequate	> 75% Score	0	0.0	24	80.0	
Total		30	100.0	30	100.0	

* Significant at 5% level, χ^2 (0.05, 2df) = 5.991

Table–2 shows that the knowledge towards needle stick injury among nursing students was assessed related to the general knowledge on needle stick injury, high risk diseases transmission through needle stick injury, causes, symptoms, complication, of needle stick injury and post prophylaxis exposure, incidence report, psychological effect and disposal protocol of contaminated needles. According to the total score obtained by each subjects knowledge was classified into adequate knowledge (>75%), moderate knowledge (51-75%) and inadequate knowledge (<50%). This gives distribution of knowledge level. Our study indicates that 20% of the students had inadequate knowledge, 80% had moderate knowledge and none of them had adequate knowledge.

Table 2: Mean, Median, Standard Deviation and pared t-test were used to make the comparison of mean between Pre-test and Post-test level of knowledge. N = 60

Aspects	Max. Score	Knowledge Scores				Paired 't' Test
		Mean	SD	Mean (%)	SD (%)	
Pre test	30	15.36	1.88	51.2	6.3	25.87*
Post test	30	21.50	1.50	71.6	5.0	
Enhancement	30	6.14	1.30	20.4	4.3	

* Significant at 5% level, t (0.05, 29 df) = 2.045

Table – 2 represent that the mean post-test knowledge score 21.50 (71.6%) was apparently higher after structured teaching Programme then the mean pre-test knowledge score 15.36 (51.2%) and the difference between the mean is 20.4%, which shows STP was effective. Hence calculated 't' value 13.9 is significant.

The data presented in Table 3 fulfill the objective 1 as out of 0 (100%) samples, majority 24 (80%) had adequate knowledge, 6(20%) had moderate knowledge. 0(0%) had inadequate knowledge regarding needle stick injury. The mean, median, and SD justify the knowledge of nursing students.

Table-3: Overall comparison of pre-testand post-test mean knowledge scores on Needle stick injury N= 60

Aspects	Max. Score	Knowledge Scores				Paired 't' Test
		Mean	SD	Mean (%)	SD (%)	
Pre test	30	15.36	1.88	51.2	6.3	25.87*
Post test	30	21.50	1.50	71.6	5.0	
Enhancement	30	6.14	1.30	20.4	4.3	

* Significant at 5% level, t (0.05, 29df) = 2.045

Table-3: shows that, The mean knowledge level in student's before Structured Teaching Programme (STP) was 15.36(51.2%) and the mean knowledge after STP was 21.5 (71.6%) with mean difference of6.14 (20.4%), which shows STP was effective. Hence calculated 't' value 13.9 is significant.

Table 4: Association between Age and Gender with Post-test Knowledge level of nursing students

Demographic Variables	Category	Sample	Knowledge Level				χ^2 Value	P Value
			Moderate		Adequate			
			N	%	N	%		
Age group (years)	17-18	6	4	66.7	2	33.3	10.36*	*P*<0.05 (5.991)
	19-20	21	2	9.5	19	90.5		
	21-22	3	0	0.0	3	100.0		
Sex	Male	6	1	16.7	5	83.3	0.05 NS	*P*>0.05 (3.841)
	Female	24	5	20.8	19	79.2		
Combined		30	6	20.0	24	80.0		

* Significant at 5% Level, NS: Non-significant
Note: Figures in the parenthesis indicate Table value.

Table 5: Association between Religion and Source of information with Post-test Knowledge level of nursing students

Demographic Variables	Category	Samp e	Knowledge Level				χ^2 Value	P Value
			Moderate		Adequate			
			N	%	N	%		
Religion	Hindu	21	1	4.8	20	95.2	15.12*	*P*<0.05 (5.991)
	Christian	2	0	0.0	2	100.0		
	Muslim	7	5	71.4	2	28.6		
Source of information	Class	25	3	12.0	22	88.0	6.00*	*P*<0.05 (3.841)
	Internet or Media	5	3	60.0	2	40.0		
Combined		30	6	20.0	24	80.0		

* Significant at 5% Level, NS: Non-significant
Note: Figures in the parenthesis indicate Table value

Table: 5 showed the association between knowledge and demographic variables. Out of demographic variables, age (χ^2 =10.36*), religion (χ^2 =15.12*), and source of information (χ^2 = 6.00*), were significantly associated with

knowledge regarding needle stick injury and sex (χ^2 = 0.05 ^{NS}), was not significantly associated with knowledge.

Discussion

Needle stick injuries are the most common route by which blood-borne viruses and/or infections such as HIV and hepatitis B and C. Such infections serve as high occupational risks and threats to healthcare workers, especially where basic rules of occupational safety and health are not implemented [14].

The aim of the study was to assess the effectiveness of structured teaching plan on knowledge regarding needle stick injury among nursing students. An evaluative approach was adopted. A total of 30 participants were selected using purposive sampling technique. Self-structured questionnaire was used to assess the knowledge on needle stick injury among nursing students. Collected data were analyzed by descriptive and inferential statistics. It was found that most of the students were having moderate [24%] and inadequate 6% level of knowledge during the pretest. However after structured teaching plan session, most of the subjects were having good knowledge adequate [24%] and moderate [6%] level of knowledge in the post test. The effectiveness of structured teaching plan was found highly significant (*P* =0.000).

It was also found that majority of the variables are significantly associated with knowledge level of NSI except gender of the students. It is finally concluded that structured teaching plan was an effective method to improve the knowledge level of the students regarding needle stick injury. The knowledge of nursing students has significant association with the Source of information because Source of information is the major source of information to gain the knowledge. This study is inline with the study showed that 88(82.2%) of the student had poor knowledge and 18(16.82%) student had average level of knowledge and 1(0.3%) student had good knowledge on needle stick injuries. The study concludes that it is the need of the hour to educate the nursing students on the prevention and the consequences of needle stick injuries [15].

In the present study, in post-test 37% (11) nursing student scored good score level, 57% (17) nursing students scored average score level whereas 2% (6) nursing students scored poor level in post-test. The similar study findings showed that the effectiveness of video assisted teaching on needle stick injury regarding knowledge and attitude among staff nurses in 2015 using quasi- experimental - pre and post-test design regarding NSI which showed the pre-test mean knowledge and attitude score was 9.5 and 33.66 respectively which was increased in post-"t"- test value knowledge (t=2.235, p < 0.0001 considered to be extremely significant which indicates significant improvement in knowledge regarding needle stick injury [16].

Conclusion

This study was conducted to assess the knowledge and evaluate the effectiveness of structured teaching Programme regarding Needlestick injury among nursing students in selected nursing institutes in Bangalore. And of the implementation of the structured teaching plan there were statistically significant improvement in student knowledge so, continuous education about Needlestick injury and its prevention among nursing students that's helpful in reducing the morbidity and mortality rate of blood born disease .

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Source of Funding: Self

Ethical Clearence

The proposed study will be conducted after the approval of research committee of the college. Permission will be obtained from the principal college of nursing. The consent of each student nurses will be obtained before data collection. Assurance will be given to the study participants regarding the confidentiality of the data collected.

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