

Research Article

Effectiveness of Teaching Programme on Knowledge of GNM - II Year Students regarding Prevention of Needle Stick Injuries at Ancillary Medical Training School, Shireen Bagh, Srinagar

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DOI: <https://doi.org/10.24321/2348.2141.202107>

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How to cite this article:

Mir MA, Bashir M, Akhter K. Effectiveness of Teaching Programme on Knowledge of GNM - II Year Students regarding Prevention of Needle Stick Injuries at Ancillary Medical Training School, Shireen Bagh, Srinagar. Trends Nurs Adm Edu. 2021;10(2):17-23.

Date of Submission: 2021-05-29

Date of Acceptance: 2021-07-09

A B S T R A C T

Background: Though mostly needle stick injuries cause just minor trauma and bleeding, yet, even without trauma and bleeding, the danger of contamination and infection remains. Thus, a needle stick injury may represent a hazard for a patient if the injured health professional carries hepatitis B virus, hepatitis C virus or human immunodeficiency virus.

Objectives: To assess the effectiveness of teaching programme on knowledge of GNM-II year students regarding prevention of needle stick injuries at Ancillary Medical Training School, Shireen Bagh, Srinagar.

Methods: In this study, a total of 50 GNM - II year students were included fulfilling the inclusion and exclusion criteria. A self-structured knowledge questionnaire was used as the research tool. Demographic variables such as place of residence, educational status of father, educational status of mother, occupation of father, occupation of mother, and previous exposure to information related to needle stick injuries were obtained.

Results: The findings of the present study revealed that there was a statistically significant association between the pre-test knowledge scores of study subjects with and previous exposure to information ($p = 0.007$) while no significant association was found between the pre-test knowledge scores of study subjects and other demographic variables like residence ($p = 0.785$), educational status of father ($p = 0.435$), educational status of mother ($p = 0.345$), occupation of father ($p = 0.851$) and occupation of mother ($p = 0.881$).

Conclusion: This study reveals the importance of educational programmes, skill training programmes, conferences, workshops and educational meetings to enhance the nursing students' knowledge regarding the prevention of needle stick injuries.

Keywords: Prevention, Needle Stick, GNM, Trauma, Bleeding

Introduction

The World Health Organization (WHO) has mentioned that 16 billion Needle Stick Injuries (NSI) were managed every year in developing nations with a dominant part (90-95%).¹ A needle stick injury is defined as an injury sustained by an individual due to a potentially contaminated needle. It typically occurs in the healthcare workers, while drawing blood, administering an intravenous or intramuscular medication since the needle can slip and injure the health care workers at that time. This may transmit pathogens from the source individual to the receiver. These injuries generally happen during needle recapping and because of the inability to put utilized needles in approved sharp holders. Mostly needle stick injuries cause only minor trauma and bleeding, but, even without trauma and bleeding the danger of contamination and infection remains. Thus, a needle stick injury may represent a hazard for a patient if the injured health professional carries hepatitis B virus, hepatitis C virus, or human immunodeficiency virus. These injuries are not only limited to the medical group but can also be found in patients, their attendants, and sanitary attendants.²

A needle stick injury is a major cause of blood-borne infections among health care workers in a hospital setting. It is found that 30 to 50% of all needle stick injuries occur during clinical procedures.³ Needle Stick Injuries (NSIs) as defined by the United States National Institute of Occupational Safety and Health are percutaneous wounds caused by needles that accidentally puncture the skin.⁴

NSIs can lead to infectious diseases like hepatitis B (HBV), hepatitis C (HCV), and AIDS. Despite their seriousness as a medical event, needle stick injuries have been neglected: most of them go unreported.⁵

Centers for Disease Control and Prevention (CDC) of the United States of America estimated that exposure to blood and body fluids by sharps and needle stick injuries affect around three million health workers annually with an estimated occurrence of six million needle stick injuries every year.⁶ Globally, there is gross under-reporting of needle stick injuries with their actual incidence being much higher than those reported.⁷

The main causes of needle stick injuries are two-hand recapping, and unsafe collection and disposal of needles. Exposure to needle stick injury is associated with student's feelings of insecurity and low self-esteem.⁸

There is no doubt that today's nursing students who become tomorrow's staff nurses have to contribute in the field of bedside nursing where they would come across various types of infections, which if not handled properly, are dangerous for their well-being. So they should be aware of the various preventive measures against these infections. Needle stick injury is one of the causes of such infections and hence the knowledge of its prevention is essential.

Needle stick injury may occur not only with freshly contaminated sharps, but it may also occur after some time, with needles carrying dry blood because the ability of human immunodeficiency virus and hepatitis C virus to cause infection decreases within a couple of hours, while hepatitis B virus remains stable during desiccation and can cause infection for more than a week.

Students are more vulnerable to needle stick injuries because of their lack of clinical experience. They are at the beginning of their nursing journey so they should be aware of needle stick injury risks that could affect their entire life. Personal experience of the investigator also showed that nursing staff is at high risk of occupational exposure to blood-borne pathogens because of needle stick injuries. Practices such as documenting needle stick injury, screening the patient, management after needle stick injuries etc. are not practised by the nursing students in most health care settings in India. Moreover, no such study has been conducted on nursing students in the valley. Thus, there is a need to conduct a study on the "prevention of needle stick injury".

Objective

To assess the effectiveness of teaching programme on knowledge of GNM-II year students regarding prevention of needle stick injuries.

Material and Methods

The present pre-experimental study was conducted in the Ancillary Medical Training School, Shireen Bagh, Srinagar which is the only nursing school associated with Government Medical College, Srinagar. The Ancillary Medical Training School also caters to paramedical courses like x-ray technology, dental technology, medical technology, anaesthesia technology, lab technology, and, recently introduced Cath-lab technology and ECG technology etc. The students of this institute get their practical training in various associated hospitals of GMC Srinagar. The criteria for selecting this study were geographical proximity, feasibility of conducting the study, availability of samples, and familiarity of the investigator with the setting.

In the present study, the target population consisted of 50 GNM - II year students who were studying at Ancillary Medical Training School, Shireen Bagh, Srinagar, Kashmir, during the period of data collection i.e. 12-09-2020 to 15-09-2020.

Inclusion and Exclusion Criteria

Nursing students who fulfilled the following criteria were included in the study:

- Studying in II year GNM course at AMT School
- Srinagar Willing to participate in the study
- Present during the study

Nursing students who were not available during the period of data collection, or were unwilling to participate in the study were excluded.

A self-structured knowledge questionnaire was used as the research tool to collect information about demographic variables and knowledge assessment. Pretesting of the tool and tryout, and pilot of self-structured knowledge questionnaire was done to check the clarity and feasibility of the tool. It was found that the tool was clearly understood by the students and it had no ambiguity. It was found that an average of 30-40 minutes was required to complete questioning of one subject as per the questionnaire. The teaching programme was developed based on the objectives of the study, the literature reviewed, and the opinion of the experts.

The researcher took permission from the parent institute (Sher-i-Kashmir Institute of Medical Science and Madr-e-Meharban Institute of Nursing Science and Research) to conduct the research. Ethical clearance was obtained and the study was found to be ethically exempted. Informed consent was obtained from all the participants. Data were planned and analysed by use of both descriptive and inferential statistics.

Result

As shown in Table 1, the findings of the present study showed that maximum number of study subjects (72%) belonged to rural areas. 68% were found to have literate fathers while 32% had reported illiterate fathers. There were 27 (54%) mothers who were literate while 23 (46%)

mothers were illiterate as reported by subjects. The fathers of majority of the study subjects were businessmen (48%), 42% were government employees, and 10% were doing private jobs. The mothers of majority of the study subjects were housewives (74%), 26% were government employees, and none of them was doing a private job. Majority of the study subjects (74%) had previous exposure to information related to needle stick injuries.

In pre-test, 56% of the study subjects had an average (17-32) knowledge score, 28% had a poor (1-16) score, and 16% had a good (33-48) score. In post-test, the majority of study subjects (82%) had a good score (Table 2).

Table 3 shows that the mean pre-test knowledge score of study subjects regarding prevention of needle stick injuries was 22.90 ± 7.98 . Mean post-test knowledge score was 35.74 ± 3.92 which is higher than the mean pre-test knowledge score. So, it can be inferred that the mean difference of 12.84 or increase in the post-test knowledge score regarding prevention of needle stick injuries was likely due to the implementation of the teaching programme.

There was a statistically significant association between the pre-test knowledge scores of study subjects and previous exposure to information ($p = 0.007$) while no significant association was found between the pre-test knowledge scores of study subjects and other demographic variables like residence ($p = 0.785$), educational status of father ($p = 0.435$), educational status of mother ($p = 0.346$), occupation of father ($p = 0.851$), and occupation of mother ($p = 0.881$) (Table 4).

Table 1. Frequency and Percentage Distribution of Demographic Parameters of Study Subjects

Demographic Parameters		Frequency	Percentage
Residence	Rural	36	72
	Urban	14	28
Educational status of father	Illiterate	16	32
	Literate	34	68
Educational status of mother	Illiterate	23	46
	Literate	27	54
Occupation of father	Govt employee	21	42
	Businessman	24	48
	Private job	5	10
Occupation of mother	Govt employee	13	26
	Housewife	37	74
	Private job	0	0
Previous exposure to information regarding needle stick injury	Yes	37	74
	No	13	26

(n = 50)

Table 2. Frequency and Percentage Distribution of Pre and Post-test Knowledge Scores of Participants

(n = 50)

Pre and Post-tests	Konwledge Score	Knowlege Level	Frequency	Percentage
Pre-test	33-48	Good	8	16
	17-32	Average	28	56
	1-16	Poor	14	28
Post-test	33-48	Good	41	82
	17-32	Average	9	18
	1-16	Poor	0	0

Table 3. Topic-wise Comparison of Pre and Post-test Knowledge of Participants

(n = 50)

Areas of Knowledge	Mean $\pm$ SD		Mean Difference	P-value
	Pre-test	Post-test		
Concept, causes, diagnosis, and complications of needle stick injury	10.33 $\pm$ 4.21	16.98 $\pm$ 5.36	6.65	< 0.001*
Prevention and management of needle stick injury	12.57 $\pm$ 4.73	18.76 $\pm$ 5.34	6.19	< 0.001*

*Significant

Table 4. Correlation Table

(n = 50)

Demographic Variables		Level of Knowledge			Chi-square	P-value	df	Result
		Good	Average	Poor				
Residence	Rural	5	21	10	0.485	0.785	2	NS
	Urban	3	7	4				
Educational status of father	Illiterate	1	10	5	1.664	0.435	2	NS
	Literate	7	18	9				
Educational status of mother	Illiterate	2	15	6	2.122	0.346	2	NS
	Literate	6	13	8				
Occupation of father	Govt employee	4	12	5	1.363	0.851	4	NS
	Businessman	4	13	7				
	Private job	0	3	2				
Occupation of mother	Govt employee	2	8	3	0.253	0.881	2	NS
	Housewife	6	20	11				
	Private job	0	0	0				
Previous exposure to information regarding needle stick injury	Yes	7	24	6	9.812	0.007	2	S
	No	1	4	8				

Discussion

The pre-test of students regarding prevention of needle stick injuries was conducted through a structured knowledge questionnaire which was followed by the implementation of the Teaching Programme (TP) on prevention of needle stick injuries. The post-test of students was conducted on the 3rd day of intervention (TP), using the same structured knowledge questionnaire to assess the effectiveness of the teaching programme.

The finding of the present study showed that 72% of the participants belonged to rural areas and the other 28% belonged to urban areas. 68% were found to have literate fathers while 32% had illiterate fathers. 54% of the subjects had mothers who were literate while 46% had mothers who were illiterate. The fathers of majority of the study subjects (48%) were businessmen, that of 42% were government employees, and the fathers of 10% of the subjects were doing private jobs. The mothers of majority

of the study subjects (74%) were housewives, 26% were government employees, and none of them was doing a private job. 74% of the respondents had previous exposure to information regarding needle stick injury whereas 26% had no information regarding the same.

Chopade, Kadam, Hiremath (2015)⁹ conducted a study to assess the effectiveness of Planned Teaching Programme (PTP) on knowledge regarding needle stick, sharp injuries and their prevention among 1st Year BSc Nursing Students at KINS. The findings revealed that 70% of the students in their study were residents of rural areas and 30% resided in urban areas. Majority of students (60%) were aware of needle stick injury. Kaur, Chauhan¹⁰ conducted a study to assess the knowledge regarding needle prick injury in relation to the occurrence of HIV/ AIDS among BSc Nursing first year students of four different colleges of nursing in Amritsar, Punjab. In their study, there were only 1.183% illiterate fathers whereas 98.81% had literate fathers. There were 7.10% illiterate mothers and 92.89% literate mothers. In their study, 7.69% of the parents had a business, 42.01% were government employees, 18.93% were doing private jobs, and 31.36% were doing any other job. Singh (2020)¹¹ conducted a study to assess the effectiveness of structured teaching programmes regarding knowledge of needle stick injury and its prevention among 60 nursing students in which 25% of the subjects had previous knowledge of needle stick injury and 75% had no previous knowledge. Sulimana, Al-Qadireb, Alazzama, Alousha, Alsarairehe, Alsarairegd (2018)¹² conducted a study to measure student nurses' level of knowledge about needle stick injury and to examine its prevalence and post-exposure measures in Jordan, in which previous exposure to needle stick injury was found in 84% of the subjects. Nandan, Katoch (2019)¹³ conducted a study to assess the effectiveness of structured teaching programme regarding prevention of needle stick injury among 30 nursing students in a selected college of nursing, Noida in which majority of the subjects i.e. 73% had previous knowledge of needle stick injury and only 27% had no previous knowledge of needle stick injury.

In pre-test, the findings of the study showed that 56% of the subjects had a knowledge score of 17-32 (average), 28% had a knowledge score of 1-16 (poor), and 16% had a knowledge score of 33-48 (good).

These findings are supported by a study conducted by Chopade, Kadam, Hiremath (2015)⁹ in which the pre-test knowledge score showed that 18.33% of the students had good knowledge, 63.33% had average knowledge, and 18.33% of the students had poor knowledge. The findings of the present study are also supported by Usharani, Sreelatha, Sudharani (2017)¹⁴ in a study titled "assess the effectiveness of structured teaching programme on knowledge regarding needle stick injury among health

workers in selected health centers of Tirupati." In pre-test, out of 50 caregivers, 25 (50%) were having moderate knowledge, 15 (30%) were having inadequate knowledge, and only 10 (20%) were having adequate knowledge. Devi, Reshmi (2019)¹⁵ conducted a study to determine the level of knowledge regarding needle stick injury among first year BSc Nursing students before structured teaching programme and to evaluate the effectiveness of structured teaching programme in terms of gain in knowledge. The frequency and percentage distribution of knowledge in pre-test revealed that 15% had poor knowledge, 65% had average knowledge, and 20% had good knowledge about needle stick injury. In the post-test, no one had poor knowledge, 15% had average knowledge, and 85% had good knowledge about needle stick injury.

In post-test, the findings of the present study showed that the post-test knowledge was good (33-48) in 82% of the study subjects followed by an average (17-32) post-test knowledge score in 18% of the study subjects, and poor knowledge score in none of the subjects.

These findings are supported by a study conducted by Usharani, Sreelatha, Sudharani (2017).¹⁴ In post-test, 23 (46%) subjects had moderate knowledge, and 17 (34%) had adequate knowledge, and 10 (20%) had inadequate knowledge. Similar findings are also revealed in a study conducted by Chopade, Kadam, Hiremath (2015).⁹ After post-test, 41 (68.33%) students got average score, 17 (28.33%) got good score, 2 (03.33%) got poor score. The mean pre-test and post-test knowledge scores in the present study were 22.19 and 35.74 respectively, which are comparable with a study done by Chopade, Kadam, Hiremath (2015),⁹ in which the pre-test mean value was 13.067 and the post-test mean value was 18.433. A study by Devi, Reshmi (2019)¹⁵ showed that on post-test, no subject had poor knowledge, 15% had average knowledge and 85% had good knowledge about needle stick injury.

In our study, the mean pre-test knowledge score of study subjects regarding prevention of needle stick injuries was 22.90 ± 7.98 , and the mean post-test knowledge score was 35.74 ± 3.92 , which is higher than the mean pre-test knowledge score.

The study is endorsed by the findings of the study conducted by Chopade, Kadam, Hiremath (2015).⁹ In the pre-test, 38 (63.33%) study subjects got average score, 11 (18.33%) got good, and 11 (18.33%) got poor score, and in post-test, 41 (68.33%) study subjects got average score, 17 (28.33%) got good score, and 2 (03.33%) got poor score. In the study conducted by Devi, Reshmi (2019)¹⁵ the mean pre-test knowledge score was 23.125 ± 3.49 as compared to the mean post-test knowledge score of 30.37 ± 4.13 .

The presented study revealed that there was a statistically

significant association between the pre-test knowledge scores of study subjects and their demographic variables like previous exposure to information related to needle stick injuries ($p = 0.007$) while no significant association was found between the pre-test knowledge scores of study subjects with other demographic variables like residence ($p = 0.785$), educational status of father ($p = 0.435$), educational status of mother ($p = 0.345$), occupation of father ($p = 0.851$), and occupation of mother ($p = 0.881$).

The findings are supported by a study by Chopada, Kadam, Hiremath (2015)⁹ which revealed that there was no significant association between pre-test knowledge score and selected demographic variables like residence ($p < 0.713$), but shows a significant association between pre-test knowledge score and previous exposure to information ($p < 0.011$). Singh (2020)¹¹ conducted a study that revealed that there was a significant association between pre-test knowledge score and selected demographic variable as calculated p value was < 0.4 (established ' p ' value of 0.05).

Limitations

A small sample size was used in the study which was confined to IInd year GNM nursing students only and did not include all the health care workers. Hence the results of this study cannot be generalised. Studies with a larger sample size are needed to ensure generalisation.

Conclusion

Pre-test findings showed that the study subjects did not possess adequate knowledge regarding prevention of needle stick injuries so there was a need to educate them regarding the same. The teaching programme was found effective in enhancing the knowledge regarding prevention of needle stick injuries as was evident from the post-test knowledge scores. There was a significant association between previous exposure to information and pre-test knowledge scores which indicates that past exposure of subjects has an effect on their knowledge regarding prevention of needle stick injuries.

Nursing student's knowledge is an important factor to avoid needle stick injuries in a clinical setting. This study reveals the importance of giving education programmes, skill training programmes, conferences, workshops, and educational meetings to enhance the nursing student's knowledge regarding the prevention of needle stick injuries. A standard protocol for prevention, control, treatment, and prevention of needle stick injuries needs to be formulated and revised periodically.

Source of Funding: None

Conflict of Interest: None

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