

A PRE-EXPERIMENTAL STUDY TO ASSESS THE EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING NEEDLE STICK INJURY AMONG STAFF NURSES WORKING IN SELECTED HOSPITALS OF UDAIPUR, RAJASTHAN

Gaurav Kumar Mali¹, Jitendra Pujari²

¹Gaurav Kumar Mali, II year M. Sc. Nursing student, Venkateshwar College of Nursing, Umarda, Udaipur.

²Jitendra Pujari, Vice Principal, Venkateshwar College of Nursing, Umarda, Udaipur

Corresponding E mail : jayp221086@gmail.com

ABSTRACT

Introduction : Needle stick injuries are wounds caused by needles that accidentally harm the skin. Needle stick wounds are risky for health care providers, who work in clinical setting with hypodermic syringes and other sharp equipment's. One of the most potentially hazardous procedure that health care personnel face is using and disposing of needles and sharps. The potential risk of transmission of blood borne viruses arises from exposure to blood and other body fluids from infected patients.

Methodology : The present study was focused to assess the effectiveness of structured teaching programme on Knowledge regarding Needle Stick Injury among Staff Nurses working in Selected Hospitals of Udaipur, Rajasthan. The study design was quantitative approach with pre experimental design adopted for this study. A total sample of 50 staff nurses were selected by convenience sampling technique. Demographic profile and structured knowledge questionnaire on needle stick injury was used for data collection. Structured teaching programme on needle stick injury was given to staff nurses. Post-test data was collected using same questionnaire after 7 days of administration of intervention. The data was analyzed by using descriptive and inferential statistics.

Results : Result reveals that in pre-test majority 25(50%) had poor knowledge, 20(40%) had average knowledge and 5(10%) had good knowledge regarding needle stick injury while in post-test majority 36(72%) had good knowledge and 14(28%) had average knowledge regarding needle stick injury. Findings showed that in pre-test mean knowledge score was 13.24 ± 4.269 and in post-test mean knowledge score was 22.52 ± 2.887 with mean difference of 9.28. The comparison was tested using paired t test ($t=11.69$, $df=49$, $p=0.001$) was statistically significant at $p<0.05$ level. Study results showed that structured teaching programme was effective in improving the knowledge of staff nurses regarding needle stick injury. Result revealed that age of staff nurses were statistically found significant association at $p<0.05$ level.

Conclusion : Study results concluded that structured teaching programme was effective in improving the knowledge of staff nurses regarding needle stick injury. There is therefore an urgent need at the hospital level to have a uniform needle stick injuries policy covering safe work practices, safe disposal of sharps, procedures in event of needle stick injury, training including pre-employment training, monitoring and evaluation of needle stick injuries and procedures for reporting needle stick injuries.

Keywords : Knowledge, Needle Stick Injury, Staff Nurses

INTRODUCTION:

Needle stick injuries may be defined as the parenteral introduction of blood or other potentially infectious material by a hollow bore needle or sharp instrument, including but not limited to needles, lancets, scalpels and contaminated broken glass. The potential risk of transmission of blood borne viruses arises from exposure to blood and other body

fluids from infected patients. Body fluids other than blood which also pose risk of infection include Cerebrospinal fluid, peritoneal fluid, pleural fluid, synovial fluid, amniotic fluid, semen, vaginal discharge, saliva and unfixed tissues and organs.¹

Needle stick injuries are wounds caused by needles that accidentally harm the skin. Needle stick wounds are risky for

health care providers, who work in clinical setting with hypodermic syringes and other sharp equipment's One of the most potentially hazardous procedure that health care personnel face is using and disposing of needles and sharps. Needle stick injuries present a major risk for infection with hepatitis B virus, hepatitis C virus and HIV.²

Occupational accidents are common in any area of work, including hospitals. Practices that control or prevent transmission of infection help to protect clients and health care workers from diseases. Clients in all health care setting are at risk for acquiring infection because of exposure to number and types of diseases. Health care workers can protect themselves from contact with infectious material or exposure to communicable diseases by having knowledge of the infectious process and appropriate barrier protection.³

The centers for disease control and prevention department of health and human services, USA estimated that 0.6-0.8 million needle stick injuries and other percutaneous injuries occur unusually among health care workers, making them susceptible to blood borne pathogens causing hepatitis B, hepatitis C and human immunodeficiency virus which are life threatening. 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 scrupulous and consistent application of universal precautions for all clients as recommended by the centres for disease control and prevention.⁴

Sharps include syringe, needle, scalpels, broken glass and other objects contaminated with blood form a source of infection. The first reported case of needle stick transmitted HIV infection lead to increasing awareness and concern about the risk to health care workers posed by sharp injuries. Today it is clear that percutaneous injuries to health care workers from needle stick and other sharps carry significant risks of transmitting blood borne pathogen such as HBV, HCV and HIV.⁵

In hospitals, nurses are the first level of the staff whom contact with risk of infection from unsafe practices related to needles and sharps. They are expected to undertake activities related to patient care with the beginning of their clinical years. Being amateurs, they lack experience and skill, therefore; at a higher risk of infection from unsafe practices related to needles and sharps.⁶

Every day, health care workers are exposed to dangerous and deadly blood borne pathogens through contaminated needle sticks, sharps, or splash exposures. It is one of the greatest risks faced by the frontline health care worker. Yet, these exposures have often been considered "part of the

job." The Needle stick Safety and Prevention Act were signed into law in November 2000 and became effective in April 2001. The passage of this federal needle stick legislation was part of a plan by the American Nurses Association (ANA) and other health care worker advocates to achieve an amendment to the federal Occupational Health and Safety Administration (OSHA) Blood borne Pathogens Standard. The purpose of this Independent Study Module is to inform nurses about the law, the additional protections it provides, and present other strategies the nurse can use to reduce occupational exposure to blood borne pathogens.⁷

The National Institute for Occupational Safety and Health (NIOSH) USA, Defined needle sticks injuries as injuries are caused by needles such as hypodermic needle, blood collection needles, intravenous styles and needles used to connect parts of IV delivery system.⁸

WHO (2002) reported, 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 needle stick injuries. WHO and others show on average: four NSIs per worker per year in the African, Eastern Mediterranean, and Asian populations.⁹

Needle stick injuries and cuts are the common occupational accidents exposing health care workers to blood and body fluids. These preventable injuries expose workers to over 20 different blood borne pathogens and result in an estimated 1000 infections per year. The most common being hepatitis B, hepatitis C and human immunodeficiency virus.¹⁰

PROBLEM STATEMENT

A Pre-experimental Study to assess the effectiveness of structured teaching programme on Knowledge regarding Needle Stick Injury among Staff Nurses working in Selected Hospitals of Udaipur, Rajasthan.

OBJECTIVES

1. To assess the pre-test knowledge regarding needle stick injury among staff nurses.
2. To assess the post-test knowledge regarding needle stick injury among staff nurses.
3. To compare the pre-test and post-test knowledge regarding needle stick injury among staff nurses.
4. To find out the association between pre-test knowledge regarding needle stick injury among staff nurses and their selected demographic variables.

5. To find out the association between post-test knowledge regarding needle stick injury among staff nurses and their selected demographic variables.

OPERATIONAL DEFINITIONS

Knowledge : It refers to correct response given by the staff nurses regarding needle stick injury will be measured by structured knowledge questionnaire.

Effectiveness : It refers to the significant increase in the level of knowledge among staff nurses regarding needle stick injury.

Structured Teaching Programme : It refers to systematically developed instructions with teaching aids designed for staff nurses regarding needle stick injury.

Needle Stick Injury : Needle stick injury is wound caused by needles that accidentally puncture the skin who work with syringes and other needle equipments.

Staff Nurses : It refers to the registered staff nurses who are working in general ward, medical and surgical ward

HYPOTHESES

H0 - There will be no significant difference between pre-test and post-test knowledge score among staff nurses after administration of structured teaching programme on needle stick injury

H1 - There will be significant difference between pre-test and post-test knowledge score among staff nurses after administration of structured teaching programme on needle stick injury

MATERIALS AND METHODS :

The present study was focused to assess the effectiveness of structured teaching programme on Knowledge regarding Needle Stick Injury among Staff Nurses working in Selected Hospitals of Udaipur, Rajasthan. The study design was quantitative approach with pre experimental design (One group pre-test and post-test design) adopted for this study. A total sample of 50 staff nurses were selected by convenience sampling technique. Informed consent was obtained from all the participants before data collection. Tool consists of Socio-Demographic variables and structured knowledge questionnaire on needle stick injury was used for data collection. Structured teaching programme on needle stick injury was given to staff nurses. Post-test data was collected using same questionnaire after 7 days of administration of intervention. The data was analyzed by using descriptive and inferential statistics.

RESULTS AND DISCUSSION :

Table 1: Frequency and percentage distribution of demographic variables

N=50

S. No.	Demographic Variables	Frequency (f)	Percentage (%)
1.	Age (in Years)		
	a. 21-25 yrs	16	32
	b. 26-30 yrs	20	40
	c. 31-35 yrs	9	18
	d. 35-40 yrs	5	10
2	Gender		
	a. Male	7	14
	b. Female	43	86
3	Professional education		
	a. GNM	14	28
	b. B.Sc. Nursing	21	42
	c. Post B.Sc. Nursing	15	30
4	Years of experience		
	a. 0-5 yrs	25	50
	b. 6-10 yrs	16	32
	c. 11-15 yrs	5	10
	d. Above 15 yrs	4	8
5	Area of posting		
	a. General ward	14	28
	b. Medical wards	15	30
	c. Surgical wards	21	42
6	In-service education on needle stick injury		
	a. Yes	6	12
	b. No	44	88

Table 1 reveals the distribution of demographic variables of staff nurses According to their age 16(32%) were in 21-25 yrs of age, 20(40%) were in 26-30 yrs of age, 9(18%) were in 31-35 yrs of age and 5(10%) were in 35-40 years of age. According to gender of staff nurses, 7(14%) were male and 43(86%) were female. Regarding professional education of staff nurses 14(28%) of staff nurses had completed GNM, 21(42%) had completed B. Sc Nursing and 15(30%) of staff nurses completed Post B. Sc Nursing. According to

experience of staff nurses, 25(50%) had 0-5 yrs of experience, 16(32%) had 6-10 yrs of experience, 5(10%) of staff nurses has 11-15 yrs of experience and 4(8%) had above 15 years of experience. With regard to area of posting of staff nurses shows that, 14(28%) are posted in general ward, 15(30%) are posted in medical wards and 21(42%) of staff nurses posted in surgical wards. According to in-service education on needle stick injury among staff nurses, the result shows that 6(12%) had attended in-service education on needle stick injury. 44(88%) of staff nurses have not attended in-service education on needle stick injury

Table 2: Pre-test and post-test level of knowledge regarding Needle stick injury among staff nurses

N=50

Level of Knowledge	Pre-Test		Post-Test	
	f	%	f	%
Poor Knowledge (0-10)	20	40	0	0
Average Knowledge (11-20)	25	50	14	28
Good Knowledge (21-30)	5	10	36	72

Table 2 depicts the level of knowledge regarding Needle stick injury among staff nurses reveals that in pre-test majority 25(50%) had poor knowledge, 20(840%) had average knowledge and 5(10%) had good knowledge where as in post-test majority 36(72%) had good knowledge and 14(28%) had average knowledge regarding needle stick injury.

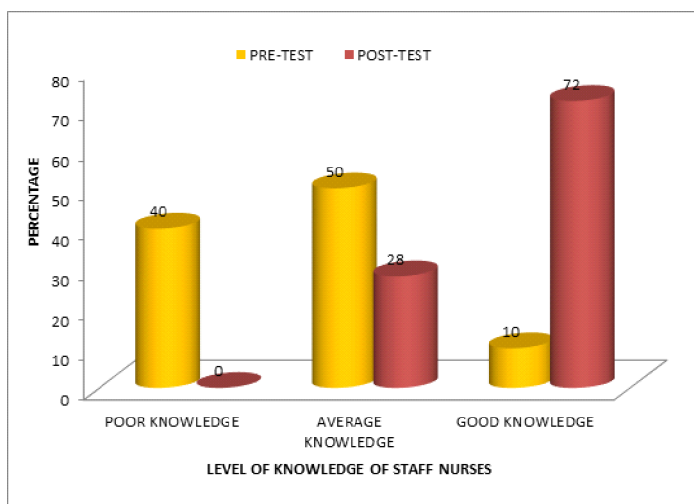


Fig 1: Distribution of pre-test and post-test level of knowledge regarding Needle stick injury among staff nurses

Table 3: Comparison of pre-test and post-test level of knowledge regarding Needle stick injury among staff nurses

N=50

Comparison	Mean	SD	Mean D	't' value	df	'p' value
Pre-test	13.24	4.269	9.28	11.69	49	0.001*
Post-test	22.52	2.887				

*p<0.05 level of significance

NS-Non significant

Table 3 illustrates that post-test mean knowledge score was 22.52±2.887 which was higher than pre-test mean knowledge score was 13.24±4.269 with mean difference of 9.28 with obtained (t=11.69, df=49, p=0.001) was statistically significant at p<0.05 level. Findings revealed that structured teaching programme was effective in improving the knowledge of staff nurses regarding needle stick injury.

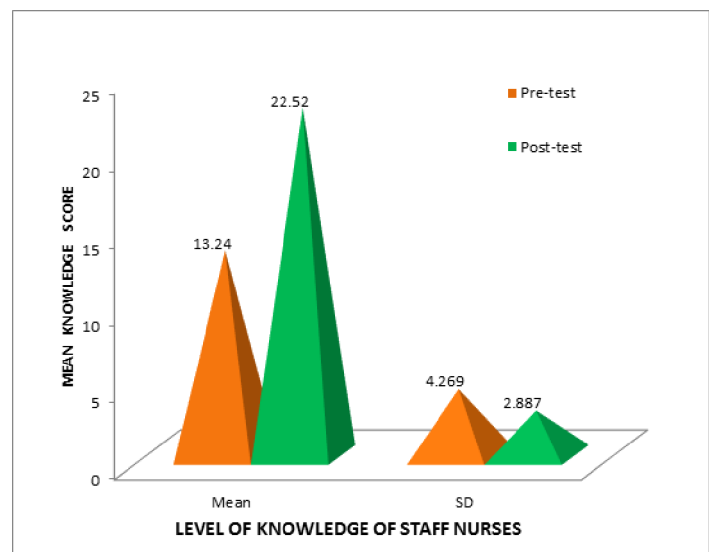


Fig 2: Distribution of mean and SD of pre-test and post-test level of knowledge regarding Needle stick injury among staff nurses

Table 4: Association between pre-test level of knowledge regarding needle stick injury among staff nurses and demographic variables

N=50

S.No.	Demographic Variable	Poor knowledge	Average knowledge	Good knowledge	Chi-square df p value
1.	Age (in Years)				
	a. 21-25 yrs	11	5	0	16.92
	b. 26-30 yrs	7	11	2	6
	c. 31-35 yrs	2	4	3	0.010*
	d. 36-40 yrs	0	5	0	
2	Gender				3.571
	a. Male	5	2	0	2
	b. Female	15	23	5	0.168 ^{NS}
3	Professional education				
	a. GNM	8	6	0	4.133
	b. B.Sc. Nursing	8	10	3	4
	c. Post B.Sc. (N)	4	9	2	0.388 ^{NS}
4	Years of experience				
	a. 0-5 yrs	10	14	1	3.086
	b. 6-10 yrs	7	7	2	6
	c. 11-15 yrs	2	2	1	0.798 ^{NS}
	d. Above 15 yrs	1	2	1	
5	Area of posting				
	a. General ward	8	6	0	5.657
	b. Medical wards	6	6	3	4
	c. Surgical wards	6	13	2	0.226 ^{NS}
6	In-service education on needle stick injury			2.273	
	a. Yes	4	2	0	2
	b. No	16	23	5	0.321 ^{NS}

*p value < 0.05 level of significance

NS-NON SIGNIFICANT

Result reveals that age of staff nurses were statistically found significant association at $p < 0.05$ level. The other demographic variables such as gender, professional qualification, years of experience, area of posting and in-

service education attended regarding needle stick injury among staff nurses was found non significant association with pre-test level of knowledge regarding needle stick injury.

Table 5: Association between post-test level of knowledge regarding needle stick injury among staff nurses and demographic variables

N=50

S.No.	Demographic Variable	Average knowledge	Good knowledge	Chi-square df p value
1.	Age (in Years)			
	a. 21-25 yrs	8	8	9.148
	b. 26-30 yrs	5	15	3
	c. 31-35 yrs	1	8	0.047*
	d. 36-40 yrs	0	5	
2	Gender			5.429
	a. Male	4	3	1
	b. Female	10	33	0.044*
3	Professional education			
	a. GNM	5	9	0.893
	b. B.Sc. Nursing	6	15	2
	c. Post B.Sc. (N)	3	12	0.640 ^{NS}
4	Years of experience			
	a. 0-5 yrs	7	18	0.446
	b. 6-10 yrs	4	12	3
	c. 11-15 yrs	2	3	0.930 ^{NS}
	d. Above 15 yrs	1	3	
5	Area of posting			
	a. General ward	5	9	1.460
	b. Medical wards	5	10	2
	c. Surgical wards	4	17	0.482 ^{NS}
6	In-service education on needle stick injury			
	a. Yes	3	3	1.637
	b. No	11	33	1
				0.201 ^{NS}

p value < 0.05 level of significance*NS-NON SIGNIFICANT**

Findings reveals that age and gender of staff nurses were statistically found significant association at $p < 0.05$ level. The other demographic variables such as professional qualification, years of experience, area of posting and in-service education attended regarding needle stick injury among staff nurses was found no significant association with post-test level of knowledge regarding needle stick injury.

DISCUSSION

The present study was focused to assess the effectiveness of structured teaching programme on Knowledge regarding Needle Stick Injury among Staff Nurses. Present study result reveals that in pre-test majority 25(50%) had poor knowledge, 20(840%) had average knowledge and 5(10%) had good knowledge where as in post-test majority 36(72%) had good knowledge and 14(28%) had average knowledge

regarding needle stick injury. Similar study was conducted by **Kaur G et al (2016)**¹¹ revealed that majority 70 (46.7%) subjects were having fair knowledge followed by 67 (44.7%) subjects having good knowledge regarding needle stick injury. Another study was conducted by **Sindhu Devi, Reshmi (2019)**¹² to evaluate effectiveness of structured teaching programme regarding Needle Stick Injury among nurses. Results showed that pre-test knowledge score were 20% of the participants obtained between the range of good, 65% obtained score in the range of average and 15% obtained poor score. Similarly post test score were 85% obtained good score and 15% obtained average knowledge. Findings of present study showed that in pre-test mean knowledge score was 13.24 ± 4.269 and in post-test mean knowledge score was 22.52 ± 2.887 with mean difference of 9.28 with obtained t test ($t=11.69$, $df=49$, $p=0.001$) was statistically significant at $p<0.05$ level. Findings conclude that structured teaching programme was effective in improving the knowledge of staff nurses regarding needle stick injury. Study results were congruent with **Dhandhargi, Kamala (2018)**¹³ conducted a pre experimental study to assess the effectiveness of planned teaching programme on knowledge regarding needle stick injury among the staff nurses. Results showed that pre-test out of 50 subjects 21 (42%) had average knowledge 29 (58%) subjects with poor knowledge regarding needle stick injury. Where as in post test out of 50 subjects 8% had excellent knowledge, 68% had good knowledge, and remaining 24% had average knowledge and no subjects were found in the category of poor or very poor knowledge. The value of standard error was 0.37, mean difference was 9.38; the calculated t value was 20.42 which was more than the table value (2.009) at 5% level of significance. There was no statistical significant association found between level of knowledge and any socio demographic variable. Present study result reveals that age of staff nurses were statistically found significant association with pre-test level of knowledge at $p<0.05$ level. Age and gender of staff nurses were statistically found significant association with post-test knowledge at $p<0.05$ level. The other demographic variables were found non significant association with pre-test and post-test level of knowledge regarding needle stick injury. Study results were found similar conducted by **Ravi Kumar, Ekata (2018)**¹⁴ revealed that chi square (2.611) is more than the table value of chi square (2.366) and there is a significant association between knowledge level and age of staff nurses.

Implications of study :

The findings of this study can be utilized in all the domains of nursing i.e. nursing practice, nursing education, nursing research and nursing administration, the implications are:

Nursing Practice

- ✓ Nurse should practice safe practices in handling sharp instruments.
- ✓ Nurses practices on handling of the sharps in the hospital to be followed according to the protocol or policy.
- ✓ Nurses must be aware of the safe handling of sharp in the hospital and its effects and management.

Nursing Education

- ✓ The nurses should be trained on safe handling of the sharps in the hospital.
- ✓ The nurses should be taught about the policies for discarding the sharp instruments.
- ✓ The nurses should have training sessions about recent changes in evidence based practices and to ensure update of their knowledge and practice.
- ✓ Educate the nurses about prophylaxis for sharp related or needle stick injuries and to prevent them from infections.

Nursing Administration

- ✓ The nurse administrator should plan for an in service education for nursing personnel regarding prevention of needle stick injury and other sharp related injuries.
- ✓ Nurse administrator should implement strict policy on handling of the sharp instruments.
- ✓ Nurse administrator should plan for periodic evaluation of nurses on sharp related injuries and its management.
- ✓ Nurse administrator should implement in-service education on needle stick injuries and other sharp injuries.

Nursing Research

- ✓ The nursing research has to be carried to evaluate the knowledge and practice among nurses on needle stick injuries and other sharp injuries.
- ✓ Nursing research helps the nursing personnel to apply evidence based practices into clinical practice on safe handling of sharps by the nurses.
- ✓ Nursing research to be conducted on following practices by the nurses on handling of sharps and to

identify the factors responsible for the sharp related injuries.

CONCLUSION :

The findings of the study shows that pre-test majority 25(50%) had poor knowledge, 20(40%) had average knowledge and 5(10%) had good knowledge regarding needle stick injury while in post-test majority 36(72%) had good knowledge and 14(28%) had average knowledge regarding needle stick injury. Study results concluded that structured teaching programme was effective in improving the knowledge of staff nurses regarding needle stick injury. Needle stick and sharp object injuries represent a major occupational challenge to health care workers. Important risk factors for such injuries include being a nurse, working in patient room, and using a disposable syringe with a needle. Educational program addressing such issues together with the observation of sharp object handling and use practices, and proper engineering control measures is an important intervention to control such incidents. There is therefore an urgent need at the hospital level to have a uniform needle stick injuries policy covering safe work practices, safe disposal of sharps, procedures in event of needle stick injury, training including pre-employment training, monitoring and evaluation of needle stick injuries and procedures for reporting needle stick injuries.

REFERENCES

1. Dulon M , Lisiak B, Wendeler D ,Nienhaus A. Causes of needle stick injuries in three health care settings .Germany journal of Hospital infection . 2017;95(3): 306-311
2. Mehta , D R, Pillai A, Singh A P, An observational study of safe infection practices in a tertiary care teaching hospital.2016; 2(5): 733-737.
3. Jannine Jagger M.P.H. Exposure prevention information network data reports. University of Virginia: International Health Care Worker Safety Center. EPINet (1999).
4. Centers for Disease Control and Prevention (CDC). Updated US Public Health Service guidelines for the management of occupational exposures to HBV, HCV, and HIV and recommendations for Post exposure prophylaxis MMWR 2001; (50RR11):1-42.
5. Donna D, Ignatavicius M, Linda W, Mary A, Mishler. Medical Surgical nursing . 2nd edition .W. B. Saunders company. 1996: 525-530.
6. Makary MA et al. Needlestick injuries among surgeons in training. N Engl J Med 2007;356(26):2693-9.
7. Rapiti E, Hutin Y. Estimation of the global burden of disease attributable to contaminated sharps injuries among health-care workers. Am J Ind Med 2005;48:482-90.
8. Sarrazin U, Brodt HR, Sarrazin C, Zeuzem S. HBV, HCV und HIV nach beruflicher exposition. Dtsch Arztebl 2005;102:A2234-9.
9. World Health Organization (WHO). Environmental Burden of disease from sharp injuries to health care workers 2003.
10. Werner BG, Grady GF. Accidental hepatitis-B-surface-antigen-positive inoculations: use of e antigen to estimate infectivity. Ann Intern Med 1982; 97:367
9. Kaur G, ChoudharyR, SharmaP.A Study to Assess the Knowledge and Practices of Nursing Students Regarding Handling and Disposal of Sharp Items.Asian Journal of Nursing Education and Research.2016;7(3):2349-2996
11. Sindhu Devi, Reshmi. A study to evaluate effectiveness of structured teaching programme regarding Needle Stick Injury among first year B.Sc Nursing students in selected colleges at Ernakulam District. International Journal Of Research Culture Society. 2019; 9(3): 83-93.
12. Dhandhargi, Kamala. Effectiveness of planned teaching programme on knowledge regarding needle stick injury among the staff nurses. International Journal of Innovative Science and Research Technology. 2018; (93): 346-348.
13. Ravi Kumar, Ekata. A study to assess the effectiveness of structured teaching programme on knowledge and practices to prevent needle stick injuries among the staff nurses. International journal of scientific research. 2018; 7(9): 68-70