Research Article **ISSN: 2581-8015**

International Journal of Nursing and Healthcare Research

Journal home page: www.ijnhr.com

https://doi.org/10.36673/IJNHR.2025.v09.i02.A11

EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE AND ATTITUDE REGARDING PREVENTION OF NEEDLESTICK INJURIES AMONG NURSING STUDENTS IN A SELECTED NURSING COLLEGE AT COIMBATORE

F. Suganthakumari*[1]

[1*]Nehru College of Nursing and Research Institute, Coimbatore-105, Tamilnadu, India.

ABSTRACT

Objectives: Assess the knowledge and attitude on prevention of Needle Stick Injuries among students. Evaluate the effectiveness of structured teaching programme on knowledge and attitude regarding prevention of Needle Stick Injuries. Determine the association between knowledge and attitude scores of nursing students on prevention of Needle Stick Injuries. **Methods:** The study was conducted in a selected nursing college at Coimbatore and the research method adopted was quasi experimental, time series design. As per the inclusion criteria 185 samples were selected. The pre-test score of knowledge and attitude was assessed by the structured questionnaire. A structured teaching program on prevention of Needle Stick Injuries (duration 30-45 minutes) was given and the post-test assessment was done on the 8th day using the same tool. Post-test-II was done on the 22nd day using the same tool. **Results:** The study revealed an increase in the knowledge and attitude level following the structured teaching program. In this study the statistical analysis showed that there was a significant improvement ($t=1.64$, $p< 0.05$), in the level of knowledge and attitude after implementation of structured teaching programme and significant association ($\chi^2=3.84$, $p<0.05$) between pre-test score of knowledge and attitude on prevention of Needle Stick Injuries with gender, year of studying, past history of Needle Stick Injuries. **Conclusion:** Structured Teaching Programme was helpful in improving knowledge and attitude among students regarding prevention of Needle Stick Injuries.

KEYWORDS

Effectiveness, Structured teaching programme and Needle Stick Injuries.

Author for Correspondence:
Suganthakumari F,
Nehru College of Nursing and Research Institute,
Coimbatore-105, Tamilnadu, India.

Email: suganthakumarim@gmail.com

INTRODUCTION

Background of the study

A Needle Stick Injury is the penetration of the skin by the sharp object which has been in contact with blood, tissue or other body fluid of person who may be carrying infectious disease. Health care workers are more prone to blood-borne pathogens following

Needle Stick and sharps injuries. A thorough understanding of the safe practices while handling needles is crucial for health care workers to create a risk-free work place environment (Center for Disease Control and Prevention, 2015)[1].

Sharps and needles may only cause small wounds in the skin, but the effects can be worse. Such instruments come in contact with blood and other body fluids and may carry the risk of infections. More than 20 dangerous blood borne pathogens including HIV and hepatitis may be transmitted through accidental injuries withcontaminated needles and sharps (Hajara Sar8war, 2017).

In healthcare, it is not just medical professionals who are at risk from sharps injuries, but rather anyone who comes into contact with needles, contaminated with infected blood. The majority of sharps injuries occur to nurses and students because their daily routine procedures involves using needles. While nurses and students are identified as having the highest risk, than other healthcare workers. A instant and appropriate response to a needle stick injury can considerably decrease the risk of infectious disease following an occupational exposure (Nichole, G Z, 2013).

Every day health care workers are exposed to dangerous and deadly blood borne pathogens through contaminated needle sticks, sharps, or splash exposures. It isone of the greatest risks faced by the health care workers. Every percutaneous needle stick and sharp injury carries a risk of infection from blood borne pathogens. Health care workers primarily are exposed to these infectious diseases through contaminated needle stick and sharp injuries. It is important that the health care workers fully understand these risks (Kockrow Christenso, 2011).

Global burden of diseases found that the annual estimated proportions ofhealthcare workers exposed to blood borne pathogens globally were 26% for HCV, 5,9% for HIV, similar to about 16,000 HCV infections in health care personnelworldwide (Rapiti E, 2013)[2]. In India health care workers were experienced sharp injuries at the rate of 2.2 per 100 full time equivalent workers at 157 hospitals in 32 states (Varon Goel, 2012). In Tamil Nadu, there were around 20,000 sharps incidents reported each year with one Needle Stick Injury in every 2 days of hospitals operation (Meriton Stanly, 2016). The prevalence and risk factors of Needle Stick Injuries among nurses working at Coimbatore teaching hospitals where studied from 656 nurses, out of which 26 (64%) nurses reported needle stick or sharps injuries. It was found that syringe needles accounted for the highest proportion of all Needle Stick Injuries 59% followed by glass items 22% and catheter wires 4% (Mathumitha M, 2017).

Unsafe injection was one of the major risk factors in the occurrence of needle stick and other sharps related injuries in both health care workers and the general public. There was an some evidence revealing a high prevalence of unsafe injection practices among health care workers in developing countries, and about 90% ofaccidents were related to Needle Stick Injuries. It had been reported that unsafe injection practices in developing countries occur in 15-50% of cases (Pili J, Golbabaei F, 2013)[3].

World Health Organization (WHO) defines safe injection as one that does not harm the recipient, does not expose the provider to any avoidable risk, and does not result in any waste that is dangerous to the community. Irrational and unsafe injection practices have been a rife in developing countries. More than 80% of the Needle Stick Injuries can be prevented through the use of safety devices and effective safety programs. Needle Stick Injuries can be prevented by maintaining "Universal Precautions" as a safety measure (World Health Organization, 2015)[4].

Globally, it is estimated that out of the total of 35 million Health Care Workers worldwide, 3 million experienced Needle Stick Injuries every year. Nurses are at the greatest risk with up to 50% of all Needle stick injuries. Nursing is a crucial occupation in Iran and nurses constitute the majority of the Health Care Workers force.

However, the lack of safe sharp devices and the high ratio of patients to nurses in the country‟s hospitals have imposed work environments characterized by a high potential in predisposing the nurses to risk of Needle Stick Injuries. Although in recent years more efforts such as the established of occupational

healprogramme and safety measures within the health system had been undertaken to protect nurses and students medical safety hazards, data on the rate of incidence of Needle Stick Injuries and their related safety measures is decresed. The present study aimed to asses the prevention of Needle Stick Injuries and to assess the knowledge and safety measures among a population of nurses (Hanafi M, *et al*, 2011)[5].

Healthcare workers are exposed to blood borne infections, such as HIV, and hepatitis B and C viruses, due to routine clinical procedures clinical in the hospital. Acquiescence with universal precautions demonstrated to reduce the risk of exposure to blood and body fluids. It is vital that every health care personnel must be well informed about the exposure risks and educated regarding prevention of needle stick injuries.

Need for study

Needle stick Injuries caused during blood collection procedures, recapping of the needles, improper disposal of sharps. Needle Stick Injuries are common and an extent inevitable in health care workers during execution of their patient care services. Percutaneous exposure occurs as a result of accidental prick by a used needle or sharps contaminated with or body fluids. Needle stick injuries injury have been recognized as a source of exposure to blood borne pathogens such as hepatitis B virus hepatitis C virus and human immunodeficiency virus for health care workers. It has been estimated by the Center Disease Control that every year more than three million health care members are exposed to blood and body fluids via sharp and mucocutaneous injuries in the United States alone with an annual estimated 6 million Needle Stick Injuries. Due to Needle Stick Injuries the risk of infectious ranges from as low as 0.2 - 0.5% for HIV to as high as 3 -10% for Hepatitis C virus and 40% for Hepatitis B virus. Although contaminated needles and other sharps should not be bend, recapped or removed, many studies have revealed that recapping being still prevalent among health care workers (Sarman Singh, 2017)[6].

A cross sectional study was conducted among 442 nursing students where 393 completed questionnaires were submitted. Out of them 237(60.3%) nursing students reported Needle Stick Injuries and most of them were female students who worked infrequent night shifts. Students who are not following the safety training programmes and not using personal protective equipment, among those injured, 59.95 were injured by syringe needles. Of those needles and sharps causing injuries, 41% were unused, and 22.7% were unknown opening ampoules or vials which were found to be the most common injury agent. A total of 89.65 of Needle Stick Injuries were not reported to hospital infection control unit. The study conveyed that nursing students were at high risk of Needle Stick Injuries. Hence Occupational safety training protocols should be developed and implemented to prevent Needle Stick Injuries among student population (Henry Ziong, 2018).

A study regarding Needle Stick Injuries was analyzed among students in Hong Kong. Out of 51 reported cases of Needle Stick Injuries, 8 had sharps injuries. The annual prevalence of sharp injuries in II,III B.Sc Nursing year were related to and checking blood glucose using glucometer, giving injection also counted for the highest percentage. Specific activities that identified when opening the needle cap, opening ampoule, inserting the needle and improper disposal of used items andunclean material in the same kidney tray (Kin Chueng, 2010)[7].

Students are at high risk for Needle Stick Injuries during their clinical practices. So the investigator has taken an initiative to create awareness among the students for control and prevention of Needle Stick Injuries.

Statement of the problem

"A Study to Determine the Effectiveness of Structured Teaching Programme on Knowledge and Attitude Regarding Prevention of Needle Stick Injuries Among Nursing Students in a Selected College at Coimbatore".

Objectives

To assess the knowledge and attitude regarding prevention of Needle Stick Injuries among study participants.

To assess the effectiveness of structured teaching program regarding prevention of Needle Stick Injuries among study participants.

To find out the association between pretest knowledge and attitude with selected demographic variables of study participants.

Assumptions

Students may have some knowledge and some favorable attitude related to prevention of Needle Stick Injuries.

Knowledge and attitude of the students regarding Needle Stick Injuries may be improved after the education on Needle Stick Injuries.

Hypothesis

H_1: There will be a significant difference between the mean pre-test and mean post- test scores of knowledge and attitude among study participants regardingNeedle Stick Injuries.

H_2: There will be a significant association between pre-test scores of knowledge and attitude of the study participants regarding prevention of Needle Stick Injuries with selected demographic variables.

Delimitation

The study is delimited to the:

B.Sc. Nursing II year and III year students.

Students who are available at the time of study

Operational definition

Determine: It refers to the knowledge and attitude regarding causes, post exposure prophylaxis, prevention of Needle Stick Injuries among study participants.

Effectiveness: It refers to the extent to which the structured teaching program has achieved the desired effect as gain in knowledge and attitude scores by study participants.

Structured teaching program: It refers to a systematically prepared teaching materials used for imparting knowledge and attitude among study participants regarding prevention of Needle Stick Injuries.

Needle stick injuries: It refers to percutaneous injuries, or percutaneous exposure incident or sharps injuries by a needle.

Projected Outcome

Structured teaching program could help to improve the knowledge and attitude of the study participants on prevention of Needle Stick Injuries.

Conceptual framework

"The conceptual frame work for this study was derived from general system model "Ludwig Von Bertalanffy (1968)". It is regarded as a universal grand theory because of its unique relevancy and applicability. It is composed of both structural and functional components that interact within a boundary that filters the type and rate of exchange with the environment. Living system terms are open because there is an on going exchange of matter, energy and information. Through the process of selecting the system which regulates the type and amount of input through self-regulation to maintain the system equilibrium or homeostasis. Some types of input are used immediately in the original state where as the other complex transformation are continuously processed through the system and released as output. The following components in the modified general system model are as follows:

Input

Input is information needed by the system. It is matter, energy, information received from the environment. In this study input is considered as the assessment of the knowledge of study participants and administration of structured teaching program. It includes demographic variables and knowledge was evaluated based on pre-test structured questionnaire regarding needle stick injury.

Throughput

It is the activity phase. It is matter, energy and information that is modified or transformed within the system. It is the process by which the system processes the input and releases and output. It is process that allows the input to change. It includes the provision of knowledge regarding Needle Stick Injury with the help of structured teaching program among study participants who are at risk of Needle Stick Injuries.

Output

It is energy, matter and information that lead a system into the environment. Inthe present study it is change in knowledge obtained by structured teaching

program on needle stick injury. The information are continuously processed through the system and released as output in an altered state. It includes evaluation of nurse's knowledge on Needle Stick Injuries with same structured questionnaire to bring changes in the level of knowledge among study participants.

Feedback

It is the response of the environment to the system. Feedback may be positive / negative / neutral. It is necessary to strengthen the input and throughput and modify them as desired when the result show any inadequate knowledge of study participants non Needle Stick Injuries.

REVIEW OF LITERATURE

A literature review is a description and analysis of the literature relevant to a particular topic. The literature review surveys scholarly articles, books and other sources relevant to particular area of research. Literature review are designed to provide an over view of sources, what has been said, who the key writers are, what are the prevailing theories and hypotheses, what questions are being asked and what methodologies are appropriate and useful.

Review of literature is the writings of recognized authorities and of previous research which provides the evidence that the researcher is familiar with what is already known and what is still unknown. Quoting studies, that shows considerable agreement that seem to prevent conflicting conclusions helps to sharpen and define understanding of the existing knowledge in the problem area, provides background for the research project and makes the reader aware of the status of the issue.

Review of literature is a key step in research process. It refers to extensive, exhaustive and systemic examination of publications relevant to the research project. The researcher analyze the existing knowledge before developing into a new area of study, when interpreting the results of the study conducted and making judgments about application of a new knowledge on nursing practice (Polit DF Hungler BD 2014).

This chapter consists of literature and research studies related to

Literature related to knowledge and attitude regarding prevention of Needle StickInjuries.

Literature related to structured teaching program on knowledge and attitude regarding prevention of Needle Stick Injuries among study participants.

Literature related to knowledge and attitude regarding prevention of Needle Stick Injuries

A study was conducted to evaluate the knowledge and attitude about needle stick injuries and sharp disposal at Army College of Dental Sciences. Purposive sampling technique was to select 200 participants which included UG students, PG students, faculty members and auxiliary staff members. A self-designed questionnaire was used. Among 200 sample, 61% reported needle stick injuries, 25.5% of them know about the several causes for it. 22% of samples got tested for any infection, 57% confirmed there was no reporting facilities, 66% were not familiar with the guidelines of reporting. It was concluded that there is a definite scope of improvement in terms of reporting and prevention of needle stick injuries. There is a need to improve knowledge and awareness of dental health care worker about the post exposures protocol (Maxillofec J, 2014)[8].

A quasi experimental study was conducted to assess the effect of educational program on knowledge and practice on prevention of needle stick and sharp injuries during clinical training for undergraduate nursing students at Faculty of Applied Medical Science and Faculty of Health Science in Dammam University at Hafr Al Batin Governate, KSA. This study recommended that increase sensitization is essential in preventing the occupational hazards, to be included in the nursing training curriculum plan and continuous educational programs are needed to increase awareness of needle stick and sharp injuries (Seham A, Ed – Hay 2015)[9].

A cross sectional study was conducted on knowledge, attitude and practice of needle stick injuries among dental professionals and students in India. The study showed that 89.23% of students had accurate knowledge regarding needle stick injuries, 91.55% of students had adequate level of practice

and 89% of the students s were taking post exposure prophylaxis for accidental Needle Stick Injuries. This study concluded that the dental students had adequate knowledge, attitude and practice regarding Needle Stick Injuries (Vinoth Kapor, 2013)[10].

A cross sectional study was conducted using structured, pre tested, guidelines interview based on the questionnaire that was administered to 200 dental professionals in Bangalore to assess the knowledge, attitude, practice and self-report.

Information of needle stick injuries. Results have shown that 81.5% of dental professional were vaccinated against hepatitis B, 27.5% of participants had history of needle stick injuries for about 12yrs and 41.80% needle stick injuries occurred during recapping. Most common reason was failure to report the incidence of needle stick injuries was declared by 29.09% of the participants. The study concluded that post exposure prophylaxis and safety device has to be provided to prevent such injuries in future among dental professionals (Murali. R, Madhusudhan Krishna, 2015).

A cross sectional study was carried out Beni suef hospitals Egypt, to assess the knowledge and practices of nurses regarding blood borne pathogens and infection control measures. Sample size was 400 nurses working in the health insurance organization, Benisuef university, general Nasser centre, and Bebba hospitals with a response rate of 77.5% (310/400).The overall mean scores of knowledge and practice of respondent nurses were 7.71+ 3.15, 9.14 +2.47 and 7.03 +3.58 respectively. Assessment of knowledge and practice showed that 93.5, 80.3 and 65.8 of nurses were aware that HIV, HBV and HCV are blood borne pathogens (Muhammed A, 2016)[11].

A cross sectional study was conducted by St. John's medical college, Bangalore 2017, to assess knowledge regarding Needle Stick Injuries and practice regarding disposal of needles and sharps among 110 interns and postgraduate medical students working in various department of tertiary care centre It was concluded among 110, 55(50%) were from the interns category and 55(50%) were from the postgraduate category and participants. 47(42.7%) were male and 63(57.3) were female students. The prevalence of Needle Stick Injuries was found to be 36.3% with female participants and postgraduates had better knowledge. Female participants and interns had better practice (Allen Joe, 2017)[12].

Literature related to structured teaching program on knowledge and attitude regarding prevention of Needle Stick Injuries among study participants

An interventional study on sustained education on Needle Stick Injuries and sharp injuries was conducted among 36 nursing students. Needle Stick Injuries rate was 57% before the educational program which came down to 2% after the program. The study concluded potential value of comprehensive infection control initiative educational program has reduced the rate of Needle Stick Injuries among the students (Siham M, 2013)[13].

A cross - sectional surveys were carried out among medical undergraduate students. The online survey was completed by 1,214 students in 2009 and 917 students in 2010. Results showed an injury rate of 21.4% per year (mean value) with accidents mostly related to vein puncture, surgical procedures, and instrument disposal. Comparing 2 parallel medical programs, the educational curriculum using objective structured clinical examinations found associated with significantly lower Needle Stick Injury incidences. Reports made to the accident insurer showed a 50% decrease in Needle Stick Injuries surrounding the introduction of safe instruments (Rifat Meraj A, 2014).

The cross sectional study aimed to assess the incidence of Needle Stick Injuries among 211 medical students at Tabriz imam Reze hospital in 2014. Results showed that 36% of the medical students have experienced Needle Stick Injuries in the last years. There was a statistical relationship between the needle stick exposure and use (p=0.619) and educational level (p=0.004) which showed the high incidence of Needle Stick Injuries in medical students and the need for implementing precise intervention (Farid Gharibi, Yousof Pashari, 2014)[14].

A pre-experimental study was conducted by SVIMS University, to assess the effectiveness of structured

teaching programme on knowledge regarding Needle Stick Injuries among 50 nurses. In pre-test, 25(50%) were having moderate knowledge. 15(30%) were having inadequate and 10(20%) of health workers having adequate knowledge. In pretest the mean score was 1.90, standard deviation was 0.707 and post-test mean knowledge was 2.14 and the standard deviation was 0.726. The t- value was 48.153. Hence research hypothesis was accepted. It was evident that the structured teaching programmed was significantly effective on improving knowledge regarding Needle Stick Injuries among nurses. The researcher identified that there was significant association between the pretest knowledge and demographic variables such as educational session regarding Needle Stick Injuries at $p < 0.05$ level. The association of post-test knowledge score of subjects with demographic variables such as age, religion, experience, exposure to number of injections, ever had Needle Stick Injuries was significant at $p < 0.05$ level (Sreelatha M, Dr. P. Sudharani 2017).

A cross-sectional study was conducted among 360 nursing staffs in a tertiary health care center of Manipur. Respondents were purposively selected and data were collected using structured questionnaire. Out of the total 360 nurses, majority (86.3%) were aware of universal precation,68% mentioned about advantages of wearing gloves, 65% knew that recapping should be avoided, 81.5% answered correctly that the aim of universal precaution is to prevent mutual transfer of infection between patients and health care workers. The study concluded that training of the health care workers on proper equipment supply, posters displaying guidelines and proper hospital policy of patient load management would significantly help both quantitatively and qualitatively for effective implication of universal precaution (Susmita Chaudhuri, (2014)[15].

A cross sectional study was carried out among 88 staff nurses in south Gujarat, India. Data regarding knowledge and practice of universal precaution was collected by Self-administered semi structured proforma. Out of 88 participants interviewed, almost all of them reported of having awareness about universal precautions and personal protective equipments. Only 44.3% nurses mentioned all the correct measures for universal precautions. 89.77% nurses were aware about health hazards of Needle Stick Injury but only 67.05% correctly reported about how Needle Stick Injury can be prevented. The study concluded that correct knowledge regarding universal precautions among nursing staff was still not of satisfactory level and training at repeated interval needs to be given to ensure correct knowledge as well as implementation of universal precautions (Priti Solanky, Hinal Baria (2013)[16].

A structured teaching programme through demonstration and power point presentation was made based on the pre-requisites of safe handling of sharps for the prevention of Needle Stick Injuries. The post-test data showed that majority of 93.3% nursing students were aware of user, 66.6%(20) nursing students performed the step maintaining visual contact with sharps, 96.6% nursing students used tourniquet for procedure, 73.3%(22) nursing students kept the sharps back to the tray after use.

80%(24) nursing students did not do recapping of sharps, 66.6%(20) nursing students immediately disposed the sharps to container. No nursing students checked for any left out sharps to needle destroyer in post-test and 13.3%(4) nursing students held the syringe by middle of the barrel while disposing in needle destroyer. The mean practice score pre-test=5.3 and post-test=8.3. The t-test score is 4.3 which is hypothesis and reveals that structured teaching programme was effective on practices in prevention of Needle Stick Injury. It could be interpreted with 95% confidence that the mean score of post-test among the nursing students of selected educational institute is significantly different from the hypothesized value (Jilmy Anu Jose, Sheeja A 2016)[17].

A quasi experimental study was conducted to assess the effectiveness of structured programme on knowledge regarding prevention and management of Needle Stick Injury among 60 students in a selected nursing college of Jalandhar, Punjab. The findings of the study revealed that, in pre-test 48.33% of subjects were having adequate level of knowledge, 38.34% of study subjects were having moderate

level of knowledge and 13.33% were having inadequate level of knowledge. In post test scores, 90% of subjects showed adequate knowledge. There was a significant improvement in the knowledge scores after the intervention (Anu Jacob Kachappillil 2017)[18].

Summary

This chapter dealt with the review of literature on various areas like causes, post exposure prophylaxis, prevention of Needle Stick Injuries and effectiveness of structured teaching programme.

This chapter gives a brief description of the methods adopted by the investigator for the study. The present study was designed to determine the effectiveness of the knowledge and attitude of students regarding prevention of Needle Stick Injuries. The study was conducted by adopting the following steps of research processes viz. Research design, setting, population and sampling, sample size determination, criteria for the selection of samples, instruments and tools for measuring variables, techniques of data collection and methods of data analysis.

Quantitative approach and design

The research design selected for this study was a quasi - experimental approach, time series design.

O_1 – Pre- test - refers to assessment of the nursing student‟s knowledge and attitude regarding Needle Stick Injuries and Intervention.

X -Intervention- refers to the structured teaching program on prevention of Needle Stick Injuries for nursing students.

O_2 – Post-test I- refers to re-assessment of the students knowledge and attitude after one week of structured teaching program using structured questionnaire.

O_3 – Post- test II- refers to re-assessment of the same after two weeks of post-test Iusing structured questionnaire.

Variables of the study

Independent Variable: Structured teaching program regarding prevention of Needle Stick Injuries.

Dependent Variable: Knowledge and attitude regarding Needle Stick Injuries among study participants.

Extraneous Variables: Previous knowledge about the Needle Stick Injuriesduring their clinical posting.

Setting of the study

The College of Nursing with an aim to provide quality Nursing education and prepare nurses with an aim to provide quality nursing education and prepare nurses with the highest level of education and practice. The College is affiliated to The Tamil Nadu Dr.MGR Medical University, Chennai and is recognized by the Indian Nursing Council (INC), New Delhi and the Tamil Nadu Nurses and Midwives Council, Chennai.

Population and sampling

The population for the study were the II and III year B.Sc Nursing Students

Sampling techniques

Purposive sampling technique was adopted for selecting the sample.

Sample size calculationUsing Power analysis

$$n = \frac{Z^2 \times N \times SD^2p}{(N-1)\, e^2 + Z^2 \times SD^2p}$$

N = size of population no of students studying in II and III yr B.Sc.,Nursing students were 190

Hence N = 190

N = size of sample

e = acceptable error (0.25)

SDp = standard deviation of a population

SDp = 1.5 (from previous study)

Z = standard variation at a given confidence level (1.96)

$$n = \frac{(1.96)\ (1.96)*190*1.5*1.5}{(190-1)\ (0.05)\ (0.05) + (1.96)\ (1.96)\ (1.5)\ (1.5)}$$

N = 180.15

Hence 180 samples were adopted.

Samples

One hundred and eighty five Nursing Students studying in II and III year B.Sc.

Nursing were selected.

Sampling Criteria: Inclusion criteria

II and III year of B.Sc., (N) students

Exclusion criteria

Those who were absent during the period of data collection.

Those who were not willing to participate in this study.

Instrument and tools for data collection

The research tool comprised three segments including demographic and professional variable proforma, structured questionnaire to assess the knowledge and attitude regarding prevention of Needle Stick Injuries.

Section A: Demographic and professional variable proforma

It represents the age, gender, year of studying, previous experience, pasthistory of any Needle Stick Injuries.

Section B: Structured knowledge questionnaire to assess the knowledge regarding prevention of Needle Stick Injuries among study participants

It consisted 20 questions Each carried one score, for the total score of 20 as follows.

Part - 1 Questions related to causes of Needle Stick Injuries (5)

Part - 2 Questions related to post exposure prophylaxis (7)

Part - 3 Questions related to prevention of Needle Stick Injuries. (8)

Section C: Rating scale to assess the attitude regarding prevention of Needle Sticks Injuries among study participants

It comprised 10 statements. There were equal number of positive and negative statements Each carried 4 scores and total was 40, as follows.

Four point likert scale was used to assess attitude regarding prevention of Needle Stick Injuries among study participants.

Part - 1 Statements related to causes of Needle Stick Injuries (2)

Part - 2 Statements related to post exposure prophylaxis (2)

Part - 3 Statements related to prevention of Needle Stick Injuries (6)

Interpretation of knowledge scores

The level of knowledge was interpreted as follows;
Adequate knowledge = 15 - 20 (> 75- 100%)
Moderately adequate knowledge = 11 - 15 (51-75 %)
Inadequate knowledge = 01 - 10 (< 50%)

Interpretation of attitude scores

The level of attitude was interpreted as follows:
Favorable attitude = 31 - 40 (> 75- 100%)
Moderately favorable attitude = 21 - 30 (51-75%)
Unfavorable attitude = 11 - 20 (<50%)

Validity and reliability of tool

The validity of the tool has been determined by the expert opinion from faculty and Nursing Superintendent along with the objectives of the study. The experts were requested to give their opinion, clarity and appropriateness, suggestions for the modification of the tool and were incorporated in the final tool.

The tool used for the study was structured questionnaire. Reliability and practicability of the tool was tested through pilot study by using split half method. It was computed using Karl Pearson‟s coefficient method. The reliability of the tool wasr = 0.88. The tool was found to be reliable and feasible.

Technique of data collection

Data collection was carried out from December 31st to February 9thon 2019. The samples were selected from the College of Nursing. Data was collected using self-structured questionnaire.

Out of 190 students, 185 students participated in the study from II and III B.Sc Nursing with the strength of 93 and 92 respectively. Pretest was carried out with the self-administered questionnaire for all the study participants. Structured teaching programme was organized on Prevention of Needle Stick Injuries with the help of power point for the two batches. Again on 8th day, post-test-I, the reassessment was done with the same set of questionnaire. On 22nd day, post-test-II was done with the same set of questionnaire.

Data collection procedure

Data was collected from the College of Nursing. Samples who met theinclusion criteria were selected by using the purposive sampling techniques for the study. After selecting the sample, data was collected through questionnaire method.

Ethical approval

Ethical clearance from the Human Ethics Committee was obtained to conduct the study.

Report on the pilot study

Pilot study was conducted to test the practicability and feasibility of the tool. Adopting purposive sampling 20 B.Sc Nursing students from II and III years were selected according to the inclusion criteria. Pre-test was conducted and structured

teaching programme on definition, causes, risk factors, post exposure prophylaxis, prevention of Needle Stick Injuries was done on the same day with power point presentation. Post-test I was conducted on 8th day. Post-test-II was conducted on 22nd day. The data were tabulated and analyzed using descriptive and inferential statistics. The scores tabulated were based on the mean, standard deviation, paired t‟ test and chi-square test.

Changes brought after the pilot study

There were no difficulties faced during the pilot study, hence no changes were made.

Data analysis plan

The collected data was analyzed by using the appropriate descriptive and inferential statistics method.

Descriptive statistics

Demographic data was analyzed using frequency and percentage

Frequency and percentage was used for the distribution of samples based ontheir knowledge and attitude regarding prevention of Needle Stick Injuries.

Mean and standard deviation was used to asses knowledge and attitude of students regarding prevention of Needle Stick Injuries as pre and post-test Iand II.

Inferential statistics

Paired „t‟ test was used to evaluate the effectiveness of structured teaching programme on the students regarding prevention of Needle Stick Injuries.

Chi-square test was used to find an association between pre-test level of knowledge and attitude among of students regarding prevention of Needle Stick Injuries with their selected demographic variables.

Chapter summary

This chapter discussed about the material and methodology followed in the present study. The method used was a time series design. This chapter also dealt with the sample population, sample size, regarding the instruments used and data collection methods. The next chapter will deal analysis and interpretation.

DATA ANALYSIS AND INTERPRETATION

Data analysis is the systematic organization and synthesis of research hypothesis using the data. Interpretation is the process of making sense of the result of the study and examine their implications. Analysis is the method of rendering qualitative data as easily understandable and providing intelligent information about the research problem which will be helpful to study and test the relationship between the variables.

In this study, the effectiveness of structured teaching programme is determined on knowledge and attitude regarding prevention of Needle Stick Injuries among Nursing students studying at the College of Nursing. The data was collected, assembled, analyzed, and tested individually and described. The findings based on the statistical analysis were presented in this chapter based on objectives.

Section A: Demographic variables of study participants regarding prevention of Needle Stick Injuries

Frequency and percentage distribution of study participants accordingto their demographic data.

Section B: Analysis and interpretation of knowledge and attitude regarding prevention of Needle Stick Injuries

Frequency and percentage distribution of level of knowledge and attitude score regarding prevention of Needle Stick Injuries.

Frequency and percentage distribution of aspect wise level of knowledge and attitude of study participants regarding prevention of Needle Stick Injuries.

Section C: Effectiveness of the structured teaching program regarding prevention of Needle Stick Injuries

The effectiveness of the structured teaching program on knowledge and attitude regarding prevention of Needle Stick Injuries.

Section D: Association between pre-test knowledge and attitude score and their selected demographic variables

Association between pre-test knowledge and attitude scores of study participants on prevention of Needle Stick Injuries.

Section A: Demographic variables of study participants regarding prevention of Needle Stick Injuries

It is observed that out of 185 study participants, Out of them, 177(96%) belonged to 18 to 20 years, 8(4%) were from the age group of 21 to 22 years. Out of them 166(90%) were females and 19 (10%) of the study participants were males in this study. Study participants from II and III year B.Sc. Nursing were equally present with 93(50%) and 92(50%) respectively. Even though 156(84%) had previous knowledge 15(8%) study participants had the past history of Needle Stick Injuries.

Section B: Analysis and interpretation of knowledge and attitude regarding prevention of Needle Stick Injuries

Distribution of study participants according to their level of knowledge on prevention of Needle Stick Injuries showed that in pre-test, majority 133 study participants (72%) had inadequate knowledge and 52 study participants (28%) had moderately adequate knowledge, where as in Post-test–I, 117 study participants (63%) had adequate knowledge and 68 study participants (37%) had moderately adequate knowledge. In Post-test –II, 145 students (78%) had adequate knowledge and 40 studyparticipants (22%) had moderately adequate knowledge after the implementation of structured teaching programme. It is found that a gradual increase in knowledge had occurred for the study participants from pre-test towards post-test-II.

The above Table No.3 depicts that in the pretest, more than half of the study participants 134(73%) had moderately favorable attitude, 6 (3%) study participants unfavorable attitude and 45(24%) study participants had favorable attitude. In Post-test I, around half of the study participants 102(55%) had favorable attitude, 81(44%) study participants had moderately favorable attitude and only two study participants had unfavorable attitude. In Post-test-II, majority 97(52%) study participants had moderately favorable attitude and 88(48%) had favorable attitude. It is concluded that the study participants at moderately favorable attitude level were majority and double the strength of study participants were seen at the level of favorable attitude from pre-test to the post-test-II.

Regarding knowledge on causes of Needle Stick Injuries, 58(31%) were in moderately adequate knowledge in the pre-test whereas in post-test I and II, 169(91%) and 173(94%) were found in adequate knowledge level. Regarding knowledge of post exposure prophylaxis on Needle Stick Injuries, majority 129(70%) had inadequate knowledge in pre-test whereas as in post-test I, majority 92(50%) in moderately adequate knowledge while in post-test II, majority 55 (30%) were in adequate level of knowledge. Regarding knowledge on prevention of Needle Stick Injuries, most of them 163 (88%) were in inadequate knowledge level whereas in post-test-I and II, majority 71(38%) and 77(42%) respectively had adequate knowledge.

It is understood that there was a maximum knowledge gain towards moderately adequate knowledge from pre-test to post-II regarding knowledge on causes of needle stick injuries whereas knowledge gain for post exposure prevention of needle stick injuries along the moderately adequate knowledge level.

attitude in the pre-test, whereas majority 160(87%) and 169 (91%) in post-test I and II respectively .had developed the favorable attitude. Post exposure prophylaxis of needle stick injuries for the study participants in the pre-test were, 124(68%), post-test I were 152(82%) and post-test were 159(86%) maintained with favorable attitude. It is evident that there was a gradual increase in the number of participants to develop favorable attitude. Regarding prevention needle stick injuries, nearly half of the study participants 110(59%) had moderately favorable attitude in pre-test while under favorable attitude 158(85%) in post-test I and 171(92%) in post-test II had favorable attitude.

It is clear from the table that from pre-test towards post-test II, the attitude scores gradually increased from unfavorable to the favorable attitude category.

Section C: Effectiveness of Structured Teaching Program regarding prevention of Needle Stick Injuries

The Table No.6 depicts the knowledge on causes of Needle Stick Injuries scores of pre-test and post- test

I, II as 3.0 ± 1.02; 4.4 ± 0.74; 4.5 ± 0.65 respectively. The knowledge on post exposure prophylaxis of Needle Stick Injuries scores of pre-test and post-test I, II were 3.0 ± 1.24; 5.2 ± 0.97; 5.9 ± 0.88 respectively. The knowledge on Prevention of Needle Stick Injuries scores of pre-test and post-test I, II were 2.9±1.22; 5.2±1.35; 6.0±1.18 respectively. The overall scores follow in the same order, 8.2±2.19; 15.7±1.71; 16.9±1.78. It concludes that there was a gradual increase in the mean and standard deviation of all three observations.

The Table No.7 depicts the attitude on causes of Needle Stick Injuries scores of pre-test and post- test I, II as 4.96 ± 1.21; 5.52 ±1.51; 5.30 ± 1.24 respectively. The attitude on post exposure prophylaxis on scores of pre-test and post-test I, II were 5.92±1.46; 6.41±1.40; 6.36±1.10 respectively. The attitude on Prevention of Needle Stick Injuries on scores of pre-test and post-test I, II were 16.34±2.46; 17.87±2.93; 17.83 ± 2.91 respectively. The overall scores follow in the same order, 26.9 ± 3.40; 29.8±4.64; 29.5±4.12. It concludes that there was a gradual increase in the mean and standard deviation of all three observations.

H_{O1}. There will be no significant difference between the pretest and mean post scores of knowledge of among study participants regarding prevention of Needle Stick Injuries.

The table shows the paired "t" value aspect wise of knowledge scores on prevention of Needle Stick Injuries aspect wise. The calculated 't' values for knowledge on causes, post exposure prophylaxis and prevention of needle stick injuries between pre-test and post-test II were found to be 16.85, 26.19 and 24.58 which is greater than the table value at $p<0.05$.

It is inferred that the structured teaching programme is found to be effective between pre-test and post-test- II rather than the other reassessments done in improving the knowledge. Hence, null hypothesis was rejected and research hypothesis (H_1) was accepted.

H_{O2}: There will be a significant difference on mean post-test level of knowledge on prevention of Needle Stick Injuries.

The table shows the paired "t" value aspect wise of attitude scores on prevention of Needle Stick Injuries aspect wise. The calculated "t" values for attitude on causes and post exposure prophylaxis of needle stick injuries were found to be 3.758 and 3.213 between pre-test and post-test I. But for prevention of needle stick injuries the "t" value was 5.504 between pre-test and post-test II which is greater than the table value at $p<0.05$.

It is inferred that the structured teaching programme is found to be effective between pre-test and post-test- I for causes and post exposure prophylaxis and between pre-test and post-test II for prevention of needle stick injuries rather than the other reassessments done. Hence null hypothesis was rejected and research hypothesis(H_2) was accepted.

Section D: Association between pre- test knowledge and attitude score and their selected demographic variables

H_3: There will not be a significant association between pre-test scores knowledge of the study participants regarding prevention of Needle Stick Injuries with selected demographic variables.

The table informs that the chi square value was greater than table value for the selected demographic variables such as gender, year of studying and past history of needle stick injuries with the pre-test knowledge score of study participants and is significant at $p<0.05$. .

The chi square value was greater than table value for the selected demographic variables such as age, previous knowledge of Needle Stick Injuries with the pre-test knowledge score of study participants and is not significant at $p<0.05$.

It is concluded that there is significant association between pre-test scores of attitude of the study participants regarding prevention of Needle Stick Injuries with gender, year of studying and past history of needle stick injuries of study participants.

The null hypothesis was rejected and the hence research hypothesis (H_3) was accepted.

H_4: There will not be a significant association between pre-test scores attitude of the study participants regarding prevention of Needle Stick Injuries with selected demographic variables.

The table informs that the chi square value was lesser than table value for all the demographic variables such a and age, gender, year of study,

previous knowledge of Needle Stick Injuries, past history of Needle Stick Injuries not significant at $p<0.05$.

It is concluded that there is no significant association between pre-test scores of attitude of the study participants regarding prevention of Needle Stick Injuries with selected demographic variables

The null hypothesis was accepted and hence the research hypothesis (H_4) was rejected.

RESULTS AND DISCUSSION

This chapter presents a detailed on the major objectives, corresponding findings and observations during the conduct of the study. These findings are also compared with the findings of similar studies.

Every day health care workers are exposed to dangerous and deadly blood borne pathogens through contaminated needle sticks, splash exposures. Unsafe injection is one of the major risk factors in the occurrence of needle sticks and other sorts related injuries in health care workers and general public. The main objective of the study is to assess the knowledge and attitude regarding prevention of needle among study participants.

Frequency and percentage distribution of study participants according to their demographic data

It is observed that out of 185 study participants, Out of them, 177(96%) belonged to 18 to 20 years, 8(4%) were from the age group of 21 to 22 years. Out of them 166(90%) were females and 19(10%) of the study participants were males in this study. Study participants from II and III year B.Sc. Nursing were equally present with 93(50%) and 92(50%) respectively. Even though 156(84%) had previous knowledge 15(8%) study participants had the past history of Needle Stick Injuries.

These findings are similar to another study conducted by Daewin in most of the subject 60% were in the age group of 18- 19 years, 30 % were in the age group of 20 -21 years and 10 % in the age group of 22-23 years. Regarding the previous knowledge 100% of the populations have neither attended conference nor seminar on Needle Stick Injuries (Daewin Das 2017).

The findings were supported by another study revealed that the total number of survey was collected from 279 students. Most of the students were females 198 belonged to (40%) in the four year. The mean score for the knowledge part was 7 out of 10 (SD = 1.7). The almost one third of the students had at least one incident of exposure to Needle Stick Injuries 73, (26.2%). Most of the students who had suffered.

Needle Stick Injuries did not inform their clinical instructions (67%) or write an incident report (86.3%) (Suliman M, 2018).

Frequency and percentage distribution of knowledge and attitude score regarding prevention of Needle Stick Injuries

The present study results revealed that, among 185 study participants during the pre-test, 52 study participants (28%) had moderately adequate knowledge, 133 study participants (72%) had inadequate knowledge. In Post-test–I, 117 study participants (63%) had adequate knowledge and 68 study participants (37%) had moderately adequate knowledge, in Post-test –II, 145 students (78%) had adequate knowledge and 40 study participants (22%) had moderately adequate knowledge after the implementation of structured teaching programme.

This study finding was supported by another study conducted by Saleem, 2010. The study revealed that the response rate of the survey was 85.75 where 61 (33.9%) were from IIIrd and IVth year while 58 students (32.2%) were from 5th year. Most than 85% students had HIV from Needle Stick Injuries. Only 16.4 % III year students, 29.5% IV year students and 36.2% final year students knew the full details of needle stick injury prevention protocols, 47 (26%) students had Needle Stick Injuries in the past, however only 14 students (29.7%) had reported the incident either to their consultant or the infection control office.

This study finding was supported by a similar study conducted by Anu Jacob Kachappillil 2017[18] which revealed that, in pre-test 48.33% of subjects were having adequate level of knowledge 38.34%of study subjects were having moderate level of knowledge and 13.33% were having inadequate level of knowledge. In post test scores 90% of subjects showed adequate knowledge. This study concluded

that, there significant improvement in the knowledge scores after the intervention.

This study also shows that in the pretest, more than half of the study participants 134(73%) had moderately favorable attitude, 6(3%) study participants unfavorable attitude and 45(24%) had favorable attitude. In Post-test I, around half of the study participants 102(55%) had favorable attitude, 81(44%) study participants had moderately favorable attitude and only two study participants had unfavorable attitude. In Post-test-II, majority 97(52%) study participants had moderately favorable attitude and 88 (48%) had favorable attitude. It is concluded that the study participants at moderately favorable attitude level were majority and double the strength of study participants were seen at the level of favorable attitude from pre-test to the post-test-II.

However Saleem, 2010 in his study mentioned that the domains of attitude and practices need to be improved as the frequency of Needle Stick Injuries increase with the increased year of medical education.

The effectiveness of the structured teaching program on knowledge and attitude regarding prevention of Needle Stick Injuries

In this study, the pre-test mean and standard deviation was 8.2 2.19 and the post-test II mean and standard deviation was improved to 16.9, 1.78. It concludes that there was a gradual increase in the mean and standard deviation of all three observations.

The present study, the findings revealed that there is an increase in the knowledge of the study participants after being exposed to the structured teaching program. The results show that there was a significant improvement in the post-test II knowledge of the study participants. Hence H_1 was statistically accepted, showing that the structured teaching progamme was effective regarding prevention of Needle Stick Injuries.

It is supported by another study conducted to assess the effectiveness of structured teaching programme on knowledge regarding needle stick, sharp injuries and their prevention among I^{st} year B.Sc Nursing students. The data on sample characteristics revealed that the pretest knowledge score was 18.33% of the students had good, 63.33% showed average and 18.33% students showed poor knowledge. After the structured teaching program 28.33% students had good, 68.33% had average and 3.33% students had poor knowledge. It showed that the knowledge level improved after the structured teaching programme (Sheetal Kadam, 2015).

Association between pre-test knowledge and attitude of study participants regarding prevention of Needle Stick Injuries and their selected demographic variables

It was concluded that there was a significant association between pre-test scores of knowledge of the study participants regarding prevention of Needle Stick Injuries with gender, year of studying and past history of needle stick injuries of study participants. The calculated chi square value was greater than table value and was significant at $p<0.05$. The null hypothesis was rejected and the research hypothesis H_3 was accepted.

It was also found that there was no significant association between pre-test scores of attitude of the study participants regarding prevention of Needle Stick Injuries with selected demographic variables. The calculated chi square value was lesser than table value for all the demographic variables was not significant .The null hypothesis was accepted and the research hypothesis was rejected.

These study findings were contradictory with another study conducted by Karim, *et al*, 2015 which was done regarding knowledge of students on Needle Stick Injuries which showed that there was significant association between the pre-test level of knowledge and age. It was also evident that there was no significant association between the level of knowledge with other demographic variables such as gender, level of education, year of experience**.**

SUMMARY AND DISCUSSION

This study was conducted to assess the effectiveness of structured teaching program for study participants administering the prevention of Needle Stick Injuries. Relevant literatures were reviewed to enrich the knowledge on the selected specialization that is the intervention structured teaching, selecting an

appropriate conceptual model, developing a frame work and research plan.

The research design adopted for this study was pre-test and post-test design, it is a type of time series design. The study was conducted in a selected College of Nursing at Coimbatore. Using purposive sampling technique among 185 nursing students.

Validity and reliability of the tool was tested through pilot study. According to the selection criteria, the study participants were selected for the study. A self-administered questionnaire was used to assess the knowledge level of students. The data was collected after ethical approval. The pre-test level knowledge was assessed and structured teaching programme was provided for the study participants for about 45 minutes. The two post test was conducted on the seventh day and after 15 days of intervention. Both the descriptive and inferential statistics were used to analyze the data. Paired "t" was used to evaluate the effectiveness of structured teaching programme on prevention of Needle Stick Injuries. Chi-square was used to find the association between pre-test evaluation of study participants regarding prevention of Needle Stick Injuries and their selected demographic variables.

Major findings of the study

Majority of the study participants 96%(177) were in the age group of 18 to20 years.

Majority of the study participants 90%(166) were female.

All were studying II and III year B.Sc., Nursing 100%(185)

Eighty four percentage of the study participants had previous knowledge ofNeedle Stick Injuries

Majority of the study participants around 63%(117) received information regarding Needle Stick Injuries

Majority of the study participants 145(78%) had adequate knowledge and 40 study participants (22%) had moderately adequate knowledge after the implementation of structured teaching programme.

Majority 97(52%) study participants had moderately favorable attitude and 88(48%) had favorable attitude.

The structured teaching programme is found to be effective for knowledge between pre-test and post-test- II rather than the other reassessments done in improving the knowledge.

The structured teaching programme is found to be effective for attitude between pre-test and post-test- I for causes and post exposure prophylaxis and between pre-test and post-test II for prevention of needle stick injuries rather than the other reassessments done.

There is significant association between pre-test scores of knowledge of the study participants regarding prevention of Needle Stick Injuries with gender, year of studying and past history of needle stick injuries of study participants.

There is significant association between pre-test scores of attitude of the study participants regarding prevention of Needle Stick Injuries with gender, year of studying and past history of needle stick injuries of study participants.

Table No.1: Frequency and percentage distribution of study participantsaccording to their demographic data N=185

S.No	Demographic data	Frequency (f)	Percentage (%)
1	**Age**		
	18 to 20 years	177	96
	21 to 22 years	8	4
2	**Gender**		
	Male	19	10
	Female	166	90
3	**Year of study**		
	II year B.Sc Nursing	93	50
	III year B.Sc Nursing	92	50
4	**Previous knowledge of Needle Stick Injuries**		
	Yes	156	84
	No	29	16
5	**Past history of Needle Stick Injuries**		
	Yes	15	8
	No	170	92

Table No.2: Frequency and percentage distribution of level of knowledge ofstudy participants regarding prevention of Needle Stick Injuries N=185

S.No	Level of knowledge	Pre-test		Post-test I		Post-test II	
		f	%	f	%	F	%
1	Adequate knowledge	0	0	117	63	145	78
2	Moderately adequate knowledge	52	28	68	37	40	22
3	Inadequate knowledge	133	72	0	0	0	0

Table No.3: Frequency and percentage distribution of level of attitude of studyparticipants regarding Needle Stick Injuries N=185

S.No	Level of attitude	Pre test		Post-test I		Post-test II	
		f	%	f	%	f	%
1	Favorable attitude	45	24	102	55	88	48
2	Moderately Favorable attitude	134	73	81	44	97	52
3	Unfavorable attitude	6	3	2	1	0	0

Table No.4: Frequency and percentage distribution of aspect wise analysis ofknowledge of study participants regarding prevention of Needle Stick Injuries N=185

Section	Pre-test						Post-test – I						Post-test - II					
	Adequate knowledge		Moderately adequate knowledge		Inadequate knowledge		Adequate knowledge		Moderately adequate knowledge		Inadequate knowledge		Adequate knowledge		Moderately adequate knowledge		Inadequate knowledge	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Knowledgeon causes of Needle Stick Injuries	58	31	72	39	55	30	169	91	13	7	3	2	173	94	10	5	2	1
Knowledgeon post exposure of Needle Stick Injuries	2	1	54	29	129	70	83	45	92	50	10	5	128	69	55	30	2	1
Knowledgeon prevention of Needle Stick Injuries	4	2	18	10	163	88	71	38	95	51	19	11	77	42	99	53	9	5

Table No.5: Frequency and percentage distribution of aspect wise analysis ofattitude of study participants regarding prevention of Needle Stick Injuries N=185

Section	Pre-test						Post-test – I						Post-test - II					
	Favorable Attitude		Moderately Favorable Attitude		Unfavorable Attitude		Favorable Attitude		Moderately Favorable Attitude		Unfavorable Attitude		Favorable Attitude		Moderately Favorable Attitude		Unfavorable Attitude	
	f	%	f	%	f	%	f	%	f	%	F	%	f	%	f	%	f	%
Attitude on causesof NeedleStick Injuries	10	5	82	45	93	50	160	87	19	10	6	3	169	91	14	8	2	1
Attitude on post exposureof NeedleStick Injuries	124	68	27	14	34	18	152	82	25	14	8	4	159	86	19	10	7	4
Attitude on prevention of Needle Stick	22	12	110	59	53	29	158	85	12	7	15	8	171	92	9	5	5	3

Table No.6: Mean, standard deviation scores of study participants on aspect wiseknowledge regarding prevention of Needle Stick Injuries N=185

S.No	Aspect wise analysis of knowledge	Max. Score	Pre-test		Post-test I		Post-test II	
			Mean	SD	Mean	SD	Mean	SD
1	Knowledge on causes of Needle Stick Injuries	5	3.0	1.02	4.4	0.74	4.5	0.69
2	Knowledge on postexposure of Needle Stick Injuries	7	3.0	1.24	5.2	0.97	5.9	0.88
3	Knowledge on prevention of Needle Stick Injuries	8	2.9	1.22	5.2	1.35	6.0	1.18
4	Overall score	20	8.2	2.193	15.7	1.716	16.9	1.781

Table No.7: Mean, standard deviation scores of study participants on aspect wiseattitude regarding prevention of Needle Stick Injuries N=185

S.No	Aspect wise analysis of Attitude	Max. Score	Pre-test		Post-test I		Post-test II	
			Mean	SD	Mean	SD	Mean	SD
1	Attitude on causes of Needle Stick Injuries	2	4.96	1.21	5.52	1.51	5.30	1.24
2	Attitude on post exposure prophylaxisof Needle Stick Injuries	2	5.92	1.46	6.41	1.40	6.36	1.10
3	Attitude on prevention of Needle Stick Injuries	6	16.34	2.46	17.87	2.93	17.83	2.91
4	Overall score	10	26.9	3.40	29.8	4.64	29.5	4.12

Table No.8: Comparison of level of knowledge regarding Needle Stick Injuries between pre and post-test-I and post-test-II scores N=185

S.No	Scores of knowledge on Needle Stick Injuries	Mean ± SD	df	calculated value	Table value
Knowledge on Causes					
1	Pre-test	3.0 ± 1.02	184	15.15*	1.64
2	Post-test-I	4.4 ± 0.74			
3	Pre-test	3.0 ± 1.02		16.85*	
4	Post-test-II	4.5 ± 0.69			
5	Post-test-I	4.4 ± 0.74		2.44*	
6	Post-test-II	4.5 ± 0.69			
Knowledge on Post Exposure prophylaxis					
7	Pre-test	3.0 ± 1.24	184	19.90*	1.64
8	Post-test-I	5.2 ± 0.97			
9	Pre-test	3.0 ± 1.24		26.19*	
10	Post-test-II	5.9 ± 0.88			
11	Post-test-I	5.2 ± 0.97		6.849*	
12	Post-test-II	5.9 ± 0.88			
Knowledge on Prevention					
13	Pre-test	2.9 ± 1.22	184	17.93*	1.64
14	Post-test-I	5.2 ± 1.35			
15	Pre-test	2.9 ± 1.22		24.58*	
16	Post-test-II	6.0 ± 1.18			
17	Post-test-I	5.2 ± 1.35		6.250*	
18	Post-test-II	6.0 ± 1.18			

Note: Statistically significant*p<0.05, S-significant

Table No.9: Comparison of level of attitude regarding needle stick injuriesbetween pre and post-test-I and post-test-II scores N=185

S.No	Scores of Attitude on Needle Stick Injuries	Mean ± SD	df	Calculated value	Table value
Attitude on Causes					
1	Pre-test	4.96 ± 1.21	184	3.758*	1.65
2	Post-test-I	5.52 ± 1.51			
3	Pre-test	4.96 ± 1.21		2.772*	
4	Post-test-II	5.30 ± 1.24			
5	Post-test-I	5.52 ± 1.51		1.522*	
6	Post-test-II	5.30 ± 1.24			
Attitude on Post Exposure Prophylaxis					
7	Pre-test	5.92 ± 1.46	184	3.213*	1.65
8	Post-test-I	6.41 ± 1.40			
9	Pre-test	5.92 ± 1.46		3.180*	
10	Post-test-II	6.36 ± 1.10			
11	Post-test-I	6.41 ± 1.40		0.422*	
12	Post-test-II	6.36 ± 1.10			
Attitude on Prevention					
13	Pre-test	16.34 ± 2.46	184	5.478*	1.65
14	Post-test-I	17.87 ± 2.93			
15	Pre-test	16.34 ± 2.46		5.504*	
16	Post-test-II	17.83 ± 2.91			
17	Post-test-I	17.87 ± 2.93		0.187*	
18	Post-test-II	17.83 ± 2.91			

Note: Statistically significant*p<0.05, S-significant

Table No.10: Association between pre-test knowledge of study participants regarding prevention of Needle Stick Injuries and their selected demographicvariables N=185

S.No	DemographicVariables	Level of knowledge				df	Chi-square value	
		Inadequate knowledge		Moderate knowledge			alculated value	Tabulated value
		f	%	f	%			
Age								
1	18 to 20 years	120	70	48	26	1	0.0174 (NS)	3.841
2	21 to 22 years	6	3	2	1			
Gender								
3	Male	14	7	**5**	**3**	1	7.9946(S)	3.841
4	Female	66	36	100	54			
Year of study								
5	II year B.Sc, Nursing	74	40	19	10	1	5.4557(S)	3.841
6	III year B.Sc, Nursing	59	32	33	18			
Previous knowledge of Needle Stick Injuries								
7	Yes	110	59	46	25	1	2.6494(NS)	3.841
8	No	16	9	13	7			
Past history of Needle Stick Injuries								
9	Yes	14	8	1	0.5	1	29.137(S)	3.841
10	No	44	24	126	68			

Note: Statistically significant *p> 0.05, NS- Not significant, S- Significant

Table No.11: Association between pre-test attitude of study participants regardingprevention of Needle Stick Injuries and their selected demographic variables N=185

S.No	DemographicVariables	Level of Attitude				df	Chi-square value	
		Unfavorable attitude		Favorable attitude			Calculated value	Tabulated value
		f	%	f	%			
Age								
1	18 to 20 years	130	70	47	26	1	2.1072 (NS)	3.841
2	21 to 22 years	4	2	**4**	**2**			
Gender								
3	Male	15	8	**4**	**2**	1	0.2639 (NS)	3.841
4	Female	122	66	44	24			
Year of study								
5	II year B.Sc, Nursing	66	36	27	15	1	0.2545 (NS)	3.841
6	III year B.Sc, Nursing	72	39	20	10			
Previous knowledge of Needle Stick Injuries								
7	Yes	117	63	39	21	1	0.9214 (NS)	3.841
8	No	22	12	7	4			
Past history of Needle Stick Injuries								
9	Yes	128	69	42	23	1	0.5414 (NS)	3.841
10	No	10	5	5	3			

Note: Statistically significant *p> 0.05, NS-Not significant, S – Significant

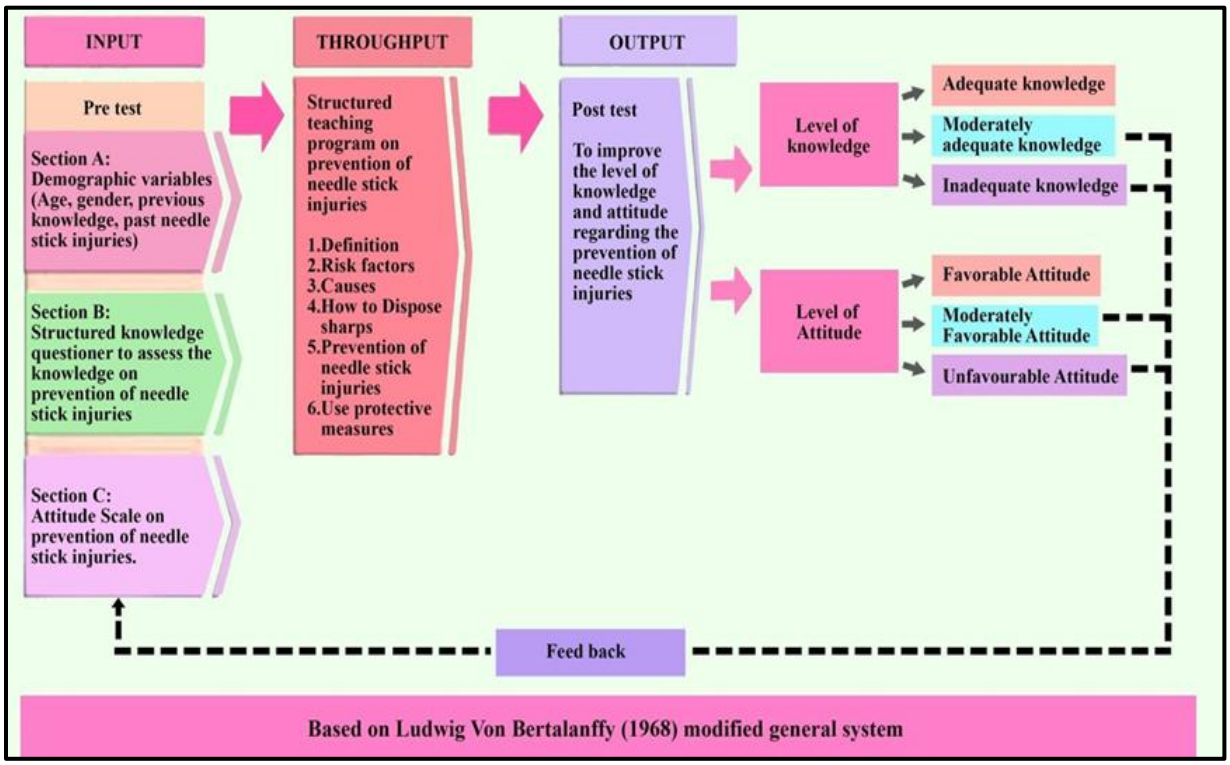

Figure No.1: Conceptual Framework to assess the effectiveness of structured teaching programme for studyparticipants on prevention of Needle Stick Injuries

Figure No.2

CONCLUSION

The findings of the study revealed that the structured teaching programme could make a significant rise in knowledge level of study participants which was obtained from the post-test scores. In this study, majority of the study participants had adequate knowledge after the structured teaching programme and more than half of study participants had moderately adequate knowledge. Majority of the study participants had moderately favorable attitude and nearly half of them had favorable attitude. The study found that structured teaching program on prevention of Needle Stick Injuries has helped to develop additional knowledge about the same. It is very effective for the study participants and they can use this knowledge in working are. The result of the study shows that there is a need to arrange informative programmes on Needle Stick Injuries, sharp injury and their prevention. Hence, structured teaching programme helps the study participants to be aware of the prevention of Needle Stick Injuries thereby protecting themselves as well as patients.

NURSING IMPLICATIONS

Nursing education

Nursing researcher has a humble opportunity to educate regarding Needle Stick Injuries and their prevention to other graduate and post graduate nursingstudents.

NURSING PRACTICE

Continuing nursing education programmes for novice nurses can be arranged to update their knowledge regarding prevention of Needle Stick Injuries and further improve their skills related to infection control in hospitals.

The senior nurses and students can disseminate the knowledge gained to the juniors who are unaware about Needle Stick Injuries and their prevention.

An ongoing training programme in the hospitals can be organized for health service providers, infection control nurses, and other professional regarding prevention of Needle Stick Injuries.

NURSING ADMINISTRATION

Periodical reinforcement in the form of in-service education, continuing education and training programs may be arranged for nurses regarding prevention of Needle Stick Injuries.

Hospital Protocols should emphasize prevention of Needle Stick Injuries in all the wards among the employees.

Sensitize all nursing personnel about Needle Stick Injuries and manage furtherif there is occurrence.

NURSING RESEARCH

Studies can be conducted regarding knowledge, attitude and practice on prevention of Needle Stick Injuries

The research can be replicated for conducting research on different specialized departments in the hospital settings.

Research can be conducted to improve hospital infection control practices thereby quality care to patients.

LIMITATIONS

It is limited only to II and III year B.Sc Nursing students.

RECOMMENDATIONS FOR FURTHER STUDY

A similar study can be replicated on a larger sample size to generalize thefindings.

A study can be conducted by using other booklets, flashcards, demonstration, role play, simulation and video.

Hospital personnel should be provided with periodic training services regarding prevention of Needle Stick Injuries.

A larger study can be carried out to assess the knowledge and attitude and practice regarding universal precaution towards infectious diseases.

SUMMARY

This chapter dealt with summary of the followed by its implications in nursing practice and nursing research. This chapter also spreads light on the limitations and recommendations.

ACKNOWLEDGMENT

The authors wish to express their sincere gratitude to Nehru College of Nursing and Research Institute, Coimbatore-105, Tamilnadu, India for providing necessary facilities to carry out this research work.

CONFLICT OF INTEREST

We declare that we have no conflict of interest.

BIBLIOGRAPHY

1. Centre for Disease Control and prevention, How to prevent needle stick and sharps injuries – CDC, 2012.
2. Rapitin E. Global burden of disease from sharps injuries to health care workers, *Environment Burden of Disease Control,* 3, 2013, 1728-1858.
3. Pili J. Golbabaeif. Occurrence of needle stick injuries in health care workers, *Journal of Nursing Practice,* 13, 2013, 191-197.
4. World Health Organization. Occupational health needle stick injuries, *WHO,* 2015.
5. Hanafi M, *et al*. Prevalence of needle stick Injuries among health care provider, *Eastern Mediterranean Health Journal,* 1, 2011, 1-10.
6. Sarman Singh. Occurrence of Needle Stick Injuries among health care workers of a tertiary care, *J Lab Physicians,* 9(1), 2012, 20-25.
7. Kin Cheung. Prevalence and risk factors needle stick Injuries among health care workers, *American Journal of Infection Control,* 10, 2012, 90-98.
8. Maxilloifec J. Prevention of Needle Stick Injuries amon health care workers, *Journal of Environmental and Publication,* 5, 2014, 1-6.
9. Seham A. Prevention of needle stick and sharp injuries during clinical training among undergraduate nursing students; Effect of educational program, *Journal of Nursing and Health Science,* 4(4), 2015, 19-32.
10. Vinod Kapoor, Ramndeep Singh. Knowledge, attitude and practice among dental professional and students in India, *Nigerian Medical Journal of Nigeria Medical Association,* 4(6), 2013, 365-370.
11. Muhammed A. Knowledge and practice of blood borne pathogens and infection control measures, *Journal of the Egyptian,* 3, 2016, 120-126.
12. Allen Joe. Knowledge of Needle Stick Injuries and its prevention among interns and post graduate students working at a tertiary health care workers, *International Journal of Community and Public Health,* 4(7), 2017, 2443-2448.
13. Siham M, AI Momani. A study of sustained reduction needle stick injuries among nursing students, an initiative educational programmed regarding a rate of needle stick injury, *American Journal of Infection Control,* 4, 2013, 654-658.
14. Farid Gharibi, Yousof Pashari. The incidence of needle stick injuries among medical students at Tahriz Iamam Reza hospital, *International Journal of Epidemiologic Research,* 3(2), 2014, 152-161.
15. Susmita Chaudhun, Omcar Prasad Baidya. Sharp injuries among doctors in a tertiary care hospital of Manipur, *Regional Institute of Medical Science,* 4, 2014, 161-164.
16. Priti Solanky. Knowledge and practice PF universal precautions among nursing staff, *International Journal of Community Medicine and Public Health,* 3(9), 2013, 2373-2376.
17. Jilmy Anu Joe, Sheeja A. Effectiveness of structured teaching programmes of practices in prevention of needle stick injuries, *Journal of Nursing,* 1(2), 2016, 11-20.

18. Anu Jacob Kachappillil. Effectiveness of structured teaching programme on knowledge regarding prevention of needle stick injuries, *Tanzania Journal of Health Research*, 17, 2017, 30-35.
19. Aiken L H. Hospital nurses occupational exposure to blood, *American Journal of Public Health*, 87(1), 2012, 103-107.
20. Abimbola O, Michael C. Needle Stick Injuries among health care workers in on do State, *International Journal of Medicine and Public Health*, 6(10), 2016, 31-34.
21. Afridi A A K, Sayani R. Needle stick injuries - risk and preventive factors; A study among health care workers in tertiary care hospitals in Pakistan, *Global Journal of Health Sciences,* 5(4), 2013, 84-92.
22. Centers for Disease Control and prevention, Recommendations for post- exposure prophylaxis (PEP) for exposure to HBV, *HCV and HIV.MMWR,* 50, 2001, 22.
23. Dash C, Bose S. Needle stick injuries among health care workers of a tertiary health care institution of West Bengal, *Journal of International Medicine and Dentistry,* 4(1), 2017, 13-17.
24. Devi N N, Paranthaman S, Devi B. Study on assessing the awareness on needle stick Injuries with regard to infection control measures among the paramedical and housekeeping staffs, *Asian Journal of Management of Research*, 4(3), 2014, 12-20.
25. Goel V, Kumar D, Singh. Occurrence of needle stick and injuries among health care workers in North India, *Journal of Laboratory Physician*, 9(1), 2017, 20-25.
26. Infection Control team, Management of needle stick
27. Injuries and incidents involving exposure to blood and body fluids, *Hertfordshire Partnership NHS Foundation Trust, Version 4*, 2014, 1-35.
28. Jaybhaye D, Kawalkar. Needle stick injuries among health care workers in tertiary care hospital of rural India, *Journal of Dental and Medical Science,* 17, 2014, 205-210.
29. Jayanth S. Needle Stick Injuries in a tertiary care hospital, *Indian Journal of Medical Microbiology*, 27(1), 2013, 44-47.
30. Park K. Textbook of preventive and social medicine, *Publisher Banarsidas*, 2nd Edition, 2010.
31. Cockcrow Christenson. Foundation and adult health nursing, *Mosby Publications, Philadelphia*, 5th Edition, 2011.
32. Lippincott, William and Wilkins. Textbook of medical surgical nursing, *India Wolterskluwer's, New Delhi,* 11th Edition, 2002.
33. Lee J J, Cheng S J. Needle stick and sharps injuries among dental healthcare workers at the university hospital, *Journal Formes Med Association,* 113(4), 2014, 227-233.
34. Lukianskyte R, Gataeva J. Needle Sticks injuries experienced by staff nurses and nursing students and their prevention, *International Journal Infection Control,* 8(1), 2011, 3-9.
35. Mual Abdulla K. Assessment of nurses knowledge regarding needle stick injuries in Erbi Hospitals, *Kufa Journal of Nursing Sciences,* 35, 2015, 103.
36. Najma R, Jamil H S. Prevalence of Needle Stick Injuries among health care providers tertiary hospital "in Tamilnadu, *International of Endorsing Health Science Research,* 1(2), 2013, 2-10.
37. Potter and Perry. Fundamental of nursing, *Mosby, South Asia*, 6th Edition, 2014.
38. Prakash K P, Patel. Epidemiology of needle stick injuries in Mangalore, *Journal of Evolution of Medical and Dental Sciences,* 1(3), 2012, 128-136.
39. Rasania S K, Sharma R. A Study of prevalence and response of needle stick injury among health care workers in a tertiary care hospital in Delhi India, *Indian J Community Med*, 35(1), 2010, 74-77.
40. Suresh Kumar D, Rama Subramanian. Needle stick injury among health care workers a report from India, *Department of Community Medicine*, 5(6), 2012, 29-33.

41. Suresh K. Sharma. Nursing Research and statistics, *Reed Elsevier India Private Limited, Uttarkand, India,* 2nd Edition, 2014, 382-446.
42. Sharma A, Bhalla P. Study on prevalence of needle sticks injury amonghealth care workers in a tertiary care hospital in New Delhi, *Indian Journal of Public Health,* 56(1), 2013, 101-103.
43. Sunil Agarwal. Prevalence of needle stick injury in India, *Journal of Nursing Practice,* 21(13), 2012, 25-30.
44. Suresh Kumar, Ramasubramanian. Needle stick Injuries among health care workers a report from India, *International Journal of Public Health Research,* 5(6), 2011, 2-10.
45. The National Surveillance System for Healthcare Workers (NaSH), Summary report for blood and body fluids exposure, *CDC,* (1995-2007), 1-27.
46. Varsha K. Pavithra. Knowledge, attitude and practice of needle stick and sharp injuries among dental professional of Bangalore in India, *Journal in Prevention Community,* 5(5), 2015, 406-412.
47. Walle L, Abebe E, Franco. Factors associated with needle stick and sharp injuries health care workers in Felege Hiwot Referral Hospital, Bahir Dar, *International Journal of Infection Control,* 11, 2013, 14-15.
48. Xujun Zhang. Needle stick and injuries among nurses at a teaching hospital in China, Journal of work place health and safety, 63(5), 2015, 219-251.
49. Ziad A M, Abdulla M. Risk analysis of needle stick and sharp object injuries among health care workers in a tertiary care hospital, *Journal of Epidemiology and Global Health,* 1, 2013, 15-30.

Please cite this article in press as: Suganthakumari F. Effectiveness of structured teaching programme on knowledge and attitude regarding prevention of needle stick injuries among nursing students in a selected nursing College at Coimbatore, *International Journal of Nursing and Healthcare Research,* 9(2), 2025, 61-84.