

A Pre-experimental Study to Assess the Effectiveness of Self-instructional Module on the Knowledge regarding Prevention of Intravenous Infusion Related Nosocomial Infection among Staff Nurses of a Selected Hospital of Patiala, Punjab

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ABSTRACT

Intravenous infusion related nosocomial infections are responsible for significant morbidity and mortality among hospitalized patients. Staff nurses working in hospitals need to have good amount of knowledge regarding prevention of nosocomial infection. The purpose of this study was to assess the effectiveness of self-instructional module in the prevention of intravenous infusion related nosocomial infection among staff nurses of a selected hospital of Patiala. The study also aimed at improving the knowledge of staff nurses regarding prevention of intravenous infusion related nosocomial infection. A quantitative approach using pre-experimental design with one group pre-test–post-test was used in study. A non-probability convenient sampling technique was used to collect data from the subjects. After the pre-test, SIM was administered and post-tested. The result of the study showed that in the pre-test knowledge assessment, the mean score was 15.17, which increased to 22.03 in the post-test. The study revealed that out of 30 staff nurses, majority of them 20(66.67%) had good knowledge and 10(33.33%) had average knowledge and no subject had excellent knowledge. After the administration of self-instructional module, majority of them 16(53.33%) had excellent knowledge and 12(40%) had good knowledge, whereas 2(6.67%) had average knowledge. The results showed a significant difference suggesting that the self-instructional module was effective in increasing the knowledge of staff nurses regarding prevention of nosocomial infection (‘t’-value=9.15, p=0.05).

Keywords: nosocomial infection, prevention, self instructional module

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INTRODUCTION

The term infection refers to a state in which parasitic organisms attach themselves to the body or the inside of body of another organism, causing contamination and disease in the host organism. Nosocomial infection is an infection originating in patients in hospital. The term ‘nosocomial infection’ comes

from two Greek words: ‘*nosus*’ meaning ‘disease’ + ‘*komeion*’ meaning ‘to care of’ [1]. Infection is considered nosocomial if it first appears within 48 h or more after admission or within 30 days after discharge from the health care setting. This type of infection is also known as hospital acquired infection. It is a serious health hazard worldwide. In spite of advances in

the prevention and control programme of nosocomial infection, it continues to be the major side-effect of hospital and contribute significantly to the rate of morbidity, mortality and cost of care [2].

Intravenous infusion related nosocomial infections commonly occur in hospitals and are transmitted due to the fact that hospitals house large number of people who are sick and whose immune systems are often in a weakened state. Peripheral intravenous infusions are very important part of medical surgical treatments for administering fluids and electrolytes, blood transfusions, and total parental nutrition as well as for chemotherapy [3]. Nosocomial infection is an important nursing health problem in hospitals. The introduction of canula may lead to complications such as phlebitis, bacteremia, etc. if aseptic technique is not followed. The most common risk factor for complications may include age of patient, type of disease, duration of infusion and care of IV canula. The most common factor is entrance of skin flora as a result of contamination of tip of IV canula during insertion [4].

Due to environmental changes and excessive exposure of medicines, microbes become resistant to the action of antibiotics. These microbes grow and colonize in the hospital and among the hospital personnel. Almost a microorganism can, on occasion, cause hospital acquired infection but those that survive in the hospital environment for longer periods and develop resistant to antibiotics and disinfectants are particularly important, like *Clostridium defficile*, Methicillin resistant *Staphylococcus aureus*, Vancomycin resistant *Staphylococcus aureus*, Vancomycin resistant *Enterococcus* etc. [5].

Infection control is the discipline concerned with preventing the spread of

infections within the health-care setting. Nurse plays a critical role in preventing and controlling infectious diseases. Nurses participate significantly in the prevention process from the initial introduction to nursing care. Microbiology and other science courses provide background information about pathogenic; organizations transfer of these scientific principles to the applied art and science of nursing involves an awareness of the dynamics of the infectious process. The staff nurses can impart high quality care for the patients if they have an increased knowledge about infection control. Aseptic techniques used by the staff nurses can reduce the mortality rate and increased length of hospital stay. In this context, the investigator would like to do the present study to educate the staff nurses working in selected hospital at Patiala to improve their knowledge and practice on infection control by providing a self-instructional module [6].

REVIEW OF LITERATURE

Extensive review of related literature was done from books, journals and internet sources. Nurses are responsible agency to initiate wide policy development and programme direction to reduce the prevalence of nosocomial infection. Infection risk is significantly increased as client care equipment and devices have become more complex. Staff nurses play an important role in the risk reduction by paying careful attention to hand hygiene, by ensuring careful administration of prescribed IV infusions and by providing IV-line care and following aseptic technique during and after the procedure which thus reduces the risk associated with occurrence of nosocomial infection [7].

As the nurses provide close and continuous care to the patient, they should have knowledge regarding preventive measures of IV related nosocomial infection. By

organizing a research study on the staff nurses regarding nosocomial infection and its preventive measures, the researcher would tend to check out the knowledge as well as the areas of deficiency among the staff nurses who are the backbone of rendering the world class and optimum health care to the individual, family and the community. So, the researcher thought of taking the task of assessing the knowledge of staff nurses who were working in the selected hospital of Patiala regarding IV infusion related nosocomial infections with a view to improve their knowledge by using self-instructional module [8]. The study will act as a milestone for planning the modification needed in imparting knowledge about the preventive measures among the nurses with deficient knowledge.

PROBLEM STATEMENT

A pre-experimental study to assess the effectiveness of self-instructional module on the knowledge regarding prevention of intravenous infusion related nosocomial infection among staff nurses of the selected hospital of Patiala, Punjab.

AIM

To increase the knowledge of staff nurses regarding prevention of IV infusion related nosocomial infection in selected hospital of Patiala.

OBJECTIVES

- i. To assess the knowledge of staff nurses regarding prevention of IV infusion related nosocomial infection in the selected hospital of Patiala.
- ii. To evaluate the effectiveness of self-instructional module in terms of gain in knowledge scores of staff nurses regarding prevention of IV infusion related nosocomial infections.
- iii. To find the association between pre-test knowledge scores with the selected demographic variables of staff nurses.

METHODOLOGY

A quantitative research approach was used. Pre-experimental single group pre-test–post-test design was used in this study which aimed at evaluating the effectiveness of a SIM on knowledge of intravenous infusion related nosocomial infections among staff nurses. The study was conducted among the staff nurses of the selected hospital of Patiala, Punjab. The sample size for the study was 30 staff nurses. Non-probability convenient sampling technique was used for obtaining a sample from the selected population. The tool used for data collection was self-structured knowledge questionnaire having 30 questions. A self-instructional module was also prepared for staff nurses. This study was conducted after getting prior permission from Medical Superintendent of selected hospital of Patiala. The research was conducted in three phases. A pre-test was done by administering knowledge questionnaire to the subjects and after that the subjects were given SIM. After 7 days, post-test was done by administering the same questionnaire to the study subjects. The data security was ensured to the study subjects.

RESULTS

The data was analyzed through descriptive and inferential statistics. The data collected is organized and presented under the following headings:

Section-1

Data presented in Table 1 revealed that in experimental group, maximum number of subjects 17(56.67%) were in the age group of 26–30 years, followed by 8(26.67%) in the age group of 31–35 years, followed by 3(10%) in the age group of above 35 years and 2(6.67%) were in the age group of below 25 years. This showed that most of the study subjects were in the age group 26–30 years. With regard to gender, out of 30 subjects, 29(96.67%) were females and

only 1 (3.33%) was male. Majority of study subjects 17 (56.67%) were married, followed by 12 (40%) were unmarried and only 1 (3.33%) was divorced. Maximum number of subjects 20 (66.67%) had diploma in General Nursing and Midwifery, followed by 6 (20%) had Post Basic B.Sc. Nursing, followed by 4 (13.33%) had B.Sc. Nursing and 0 (0%) had M.Sc. Nursing. Majority of subjects 20 (66.67%) had professional experience of 6–10 years, followed by 5 (16.67%) had experience of more than 10 years, followed by 4 (13.33%) had professional experience of 1–5 years and only 1 (3.33%) had professional experience of less than 1 year. Maximum subjects, that is, 20 (66.67%) were posted in medical-surgical area, followed by 4 (13.33%) were posted in obstetrics and paediatric units and orthopaedic units respectively, followed by 2 (6.67%) were posted in ICU and OTs. Most of the study subjects, that is, 18 (60%) had previous knowledge from course curriculum, followed by 11 (30.55%) gathered information through in-service education, whereas only 1 (3.33%) gathered information from mass media.

Section-2

The data presented in Table 2 and Figure 1 shows the pre-test and post-test knowledge scores of staff nurses regarding prevention of IV infusion related nosocomial infection among the experimental group. Out of 30 subjects, during pre-test, majority of them 20 (66.67%) had good knowledge and 10 (33.33%) had average knowledge and no subject had excellent knowledge. In the post-test, majority of them 16 (53.33%) had excellent knowledge and 12 (40%) had good knowledge, whereas 2 (6.67%) had average knowledge.

Comparison of Pre-Test and Post-Test Mean Knowledge Scores among Experimental Group

In order to find out the significance of difference between mean of pre-test and

post-test knowledge scores of experimental groups, paired 't-value' was computed.

Table 1. Frequency and percentage distribution of study subjects based on their sample characteristics (N=30).

S.N.	Sample Characteristics	Experimental Group	
		N	%
1.	Age (years)		
	• <25	2	6.67
	• 26–30	17	56.67
	• 31–35	8	26.67
	• >35	3	10
2.	Gender		
	• Male	1	3.33
	• Female	29	96.67
3.	Marital Status		
	• Married	17	56.67
	• Unmarried	12	40
	• Divorced	1	3.33
4.	Professional Qualification		
	• GNM	20	66.67
	• Post Basic B.Sc. Nursing	6	20
	• Basic B.Sc. Nursing	4	13.33
	• M.Sc. Nursing	0	0
5.	Professional Experience		
	• Less than 1 year	1	3.33
	• 1–5 years	4	13.33
	• 6–10 years	20	66.67
	• >10 years	5	16.67
6.	Area of Clinical Posting		
	• Medicine and Surgery	20	66.67
	• Obstetrics and Paediatrics	4	13.33
	• Orthopaedics	4	13.33
	• ICU or OTs	2	6.67
7.	Previous Source of Information		
	• Mass Media	1	3.33
	• Inservice education	11	30.55
	• Course curriculum	18	60
	• Any other	0	0

Table 2. Frequency and distribution of level of knowledge score of staff nurses regarding prevention of iv infusion related nosocomial infection among the experimental group.

Level of Knowledge	Pre-Test		Post-Test	
	n	%	n	%
Average	10	33.33	2	6.67
Good	20	66.67	12	40
Excellent	0	0	16	53.33

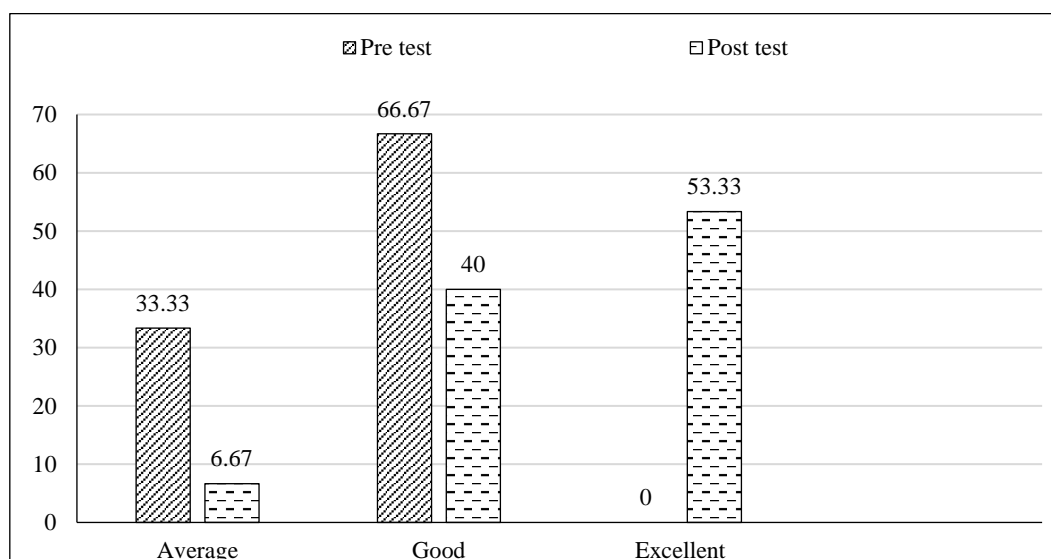


Fig. 1. Frequency and percentage distribution of level of knowledge scores of staff nurses regarding prevention of iv infusion related nosocomial infection among the experimental group.

The data is presented in Table 3 to test significant difference of mean in pre-test and post-test values, the following hypothesis was stated:

H₁: There will be significant difference between the pre-test and post-test knowledge of staff nurses working in the selected hospital of Patiala regarding prevention of nosocomial infection.

Table 3. Comparison of pre-test and post-test mean knowledge scores of staff nurses 'knowledge scores (N=30).

Pre-Test		Post-Test		
n	Mean	Mean	SE	t'-Value
30	15.17	22.03	2.35	9.15

SE: Standard Error.

The range of pre-test score is 5–20.

The range of post test score is 11–26.

The data presented in Table 3 and Figure 2 shows that the mean pre-test knowledge score is 15.17 and the mean post-test knowledge score is 22.03. In order to find out the significance of difference between pre-test and post-test knowledge score, paired 't-value' was computed. The obtained 't-value' of 9.15 is found to be greater than the table value ($p=2.05$) which implies that the difference between the pre-test and post-test knowledge was found statistically highly

significant at 0.05 level of significance. Therefore, the researcher accepted the hypothesis H₁ that mean post-test score of staff nurses who will read the self-instructional module regarding prevention of nosocomial infection among the experimental group will be significantly higher than the pre-test scores.

Thus, it can be inferred that the mean post-test score of staff nurses was significantly higher than the pre-test scores.

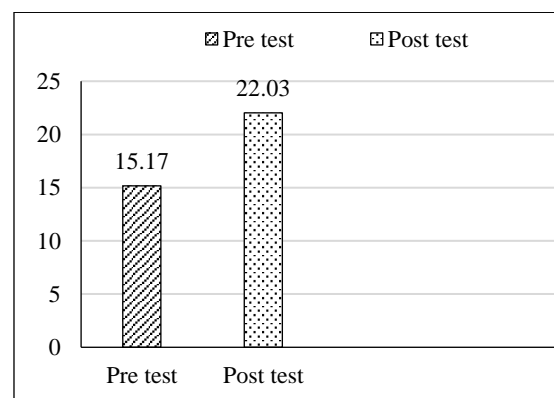


Fig. 2. Comparison of pre-test and post-test knowledge scores of staff nurses.

Section-3

Table 4 depicts that the obtained chi square value for Age ($\chi^2=4.78$, $p=0.05$),

Gender ($\chi^2=1.034$, $p=0.05$), Marital status ($\chi^2=1.84$, $p=0.05$) Professional qualification ($\chi^2=2.46$, $p=0.05$), Professional experience ($\chi^2=2.2$, $p=0.05$), Area of posting ($\chi^2=4.2$, $p=0.05$), Previous source of information ($\chi^2=1.32$, $p=0.05$) is less than tabulated chi square value which indicates that there was not any significant association between post-test knowledge with selected demographic variables.

Table 4. Association of the pre-test knowledge scores regarding prevention of iv infusion related nosocomial infection with selected demographic variables.

S.N.	Socio-Demographic Variables	Post Test Knowledge Scores		df	χ^2
		<Median	≥Median		
1	Age (years)				
	• <25	01	01	03	4.78
	• 26–30	11	06		
	• 31–35	02	06		
	• >35	01	02		
2	Gender				
	• Male	00	01	01	1.034
	• Female	15	14		
3	Marital Status				
	• Married	07	10	02	1.84
	• Unmarried	07	05		
	• Divorced	01	00		
4	Professional Qualification				
	• GNM	12	08	03	2.46
	• Post Basic B.Sc. Nursing	02	04		
	• Basic B.Sc. Nursing	01	03		
	• M.Sc. Nursing	00	00		
5	Professional Experience				
	• <1 year	00	01	03	2.2
	• 1–5 years	03	01		
	• 6–10 years	10	10		
	• >10 years	02	03		
6	Area of Posting				
	• Medical-Surgical	11	09	03	4.2
	• Obstetrics and Paediatrics	01	03		
	• Orthopaedics	01	03		
	• ICU and OTs	02	00		
7	Previous Source of Information				
	• Mass media	00	01	03	1.32
	• Inservice education	05	06		
	• Course curriculum	10	08		
	• Any other	00	00		

DISCUSSIONS

Effectiveness of Self-Instructional Module on Knowledge regarding Prevention of IV Infusion Related Nosocomial Infection among Staff Nurses of Selected Hospital of Patiala, Punjab

Pre-test knowledge scores varied from 5–20 and the mean pre-test knowledge score was 15.17. The post-test knowledge score varied from 11–26 and the mean post-test knowledge score was 22.03.

It is evident from the results that the mean knowledge scores of subjects after post-test was quite high [9–11]. These findings reveal that Self-Instructional Module has a positive impact on knowledge in terms of increase in knowledge of staff nurses regarding prevention of nosocomial infection. A similar study was conducted by Jacob *et al.* to assess the effectiveness of self-instructional module on knowledge regarding prevention of nosocomial infection among staff nurses of NICU in selected hospitals of Mangalore. In pre-test knowledge assessment, the mean percentage of response was 50.73% while mean and SD was 15.223 ± 2.5 which was increased to 92.83% with mean and SD of 27.85 ± 1.20 in the post-test [12].

Hence, SIM was an effective strategy for improving the knowledge of staff nurses regarding prevention of nosocomial infection.

Findings Relate to Comparison of Difference between Pre-Test and Post-Test Knowledge Score regarding Prevention of IV Infusion Related Nosocomial Infection among the Staff Nurses

In the group, the mean difference between the mean pre-test and mean post-test knowledge score is 6.86. The obtained 't-value'=9.15 was found to be greater than the table value $p=2.05$ which implies that

the difference in pre-test and post-test knowledge scores was found statistically significant at the level of 0.05. Therefore, this indicated that the self-instructional module has helped to increase the knowledge scores. Therefore, the researcher accepted the research hypothesis (H_1).

CONCLUSION

The study was undertaken to assess the effectiveness of self-instructional module among the staff nurses of selected hospital of Patiala regarding prevention of IV infusion related nosocomial infection. The study revealed that out of 30 staff nurses, majority of them 20 (66.67%) had good knowledge and 10(33.33%) had average knowledge and no subject had excellent knowledge. After the administration of self-instructional module, majority of them 16(53.33%) had excellent knowledge and 12(40%) had good knowledge, whereas 2(6.67%) had average knowledge.

The analysis of findings indicated that the mean percentage of post-test scores of staff nurses after administration of self-instructional module was more than pre-test level of knowledge scores. Hence, it is concluded that the self-instructional module is an effective teaching strategy which can help the staff nurses to increase their knowledge regarding prevention of nosocomial infection.

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