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ASSESSMENT OF EFFECTIVENESS OF SELF-INSTRUCTIONAL MODULE ON KNOWLEDGE REGARDING PREVENTION OF HOSPITAL-ACQUIRED INFECTION AMONG B.SC. NURSING STUDENTS IN SELECTED NURSING COLLEGES AT JAIPUR

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ABSTRACT

The study aims to assess the effectiveness of the self-instructional module on knowledge regarding the prevention of hospital-acquired infection among B.Sc. Nursing students in selected nursing colleges at Jaipur. A descriptive experimental design is used to Assessment of effectiveness of a self-instructional module on knowledge regarding the prevention of hospital-acquired infection. Data was collected before and after the intervention from 60 samples selected among Nursing students of the Medical & Technology Institute of Nursing, Jaipur, by using a non-probability convenience sampling method. The study demonstrates that the self-instructional module was highly effective in improving the B.Sc. Nursing students' knowledge of preventing hospital-acquired infections. In the pre-test, the vast majority of students had inadequate knowledge (61.67%), while 0% possessed adequate knowledge. Following the intervention, this dynamic completely flipped: 0% remained in the inadequate category, and 73.33% achieved adequate knowledge levels. The average scores further support this dramatic shift, as the mean knowledge score nearly doubled from 13.01 in the pre-test to 24.13 in the post-test. Because the standard deviation remained tightly stable between the two phases (4.38 vs. 4.77), it indicates that the entire group progressed uniformly rather than splitting into highly varied extremes. Ultimately, a paired t-test score of 28.51 ($df = 59$) easily cleared the table value at the 0.05 significance level, statistically proving that these substantial knowledge gains were a direct result of the instructional module rather than random chance. The present study reveals that the self-instructional module was highly effective in imparting knowledge on the prevention of hospital-acquired infections among B.Sc. Nursing students. The educational intervention had a statistically significant effect on improving overall knowledge levels, successfully shifting the majority of participants from inadequate to adequate scores. These findings establish that structured educational materials are a powerful tool for enhancing clinical awareness and upgrading the necessary competencies required to maintain safety and infection control in healthcare settings.

Keywords: Hospital-Acquired Infection, Prevention, Nursing Students, Knowledge, Assess

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INTRODUCTION

Hospital-acquired infections (HAIs), also called as nosocomial infections, and is an infection that first appear between 48 hours and four days after a patient is admitted to a hospital or other health care facility. Hospital-acquired infections are widespread. And contribute to the increased morbidity and mortality in hospitals.

The Centers for Disease Control and Prevention (CDC) estimates that more than two million patients develop hospital-acquired infections in the United States each year. About 90,000 of these patients die as a result of their infections.

In India, 30 to 35 percent of persons admitted to hospitals develop HAIs. Among hospital-acquired infections 30to40% are urinary tract infections, 15 to 20% surgical wound infections, 15 to 20% lower respiratory tract infections and 5 to 15% blood stream infections.3 The incidence of HAI in Karnataka has been recorded 6.5%.

Intravenous or IV therapy is probably the most common acute care invasive procedure. Statistics are difficult to confirm, but at least 90 percent of all hospitalized patients are thought to require some type of IV therapy during their course of treatment. The risk of IV related infection, as in any invasive procedure, is a serious concern. In fact, current studies indicate that these central venous access devices (VADs) are often associated with significant hospital morbidity and mortality. The human and economic costs of catheter – related infections remain high. The additional cost burden of this hospital acquired infection central VAD infections has been reported at $ 25,000 or more per episode.

Hospital acquired infections (HAIs) significantly increase both the patient's length of stay and the cost of disease. For this reason, HAIs are one of the most important problems that intensive study is devoted to many countries around the world. The purpose of this study was to investigate how HAIs prolong the length of stay and add unnecessary cost to the patient. The study compared two matched groups and suggested that a patient with a HAI spent an additional 23 days in the hospital compared with a patient not affected with a HAI. The results also showed that a patient with a HAI had to pay more in almost all cost categories compared with a non-infected patient.

STATEMENT OF THE PROBLEM

"Assessment of the effectiveness of a self-instructional module on knowledge regarding prevention of hospital-acquired infection among B.Sc. Nursing students in a selected nursing college at Jaipur."

The objectives of the study were:

- To assess the pre-test knowledge regarding the prevention of hospital-acquired infection among B.Sc. Nursing students.

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- To find out the association between pre –test knowledge regarding prevention of hospital-acquired infection and selected demographic variables.
- To find out the effectiveness of the self-instructional module on knowledge regarding the prevention of hospital-acquired infection.

METHODOLOGY

A descriptive research approach is adopted for conducting the present study. The selection of the design was based on the purpose of the study. The purpose of the study was to assess the effectiveness of a self-instructional module on knowledge regarding the prevention of hospital-acquired infection among B.Sc. Nursing students. Experimental research is adopted for conducting the present study. It includes manipulation, control, and randomization. The research design selected for the present study is a one-group pre-test and post-test design.

STUDY SETTING & POPULATION

This study has been conducted at the Medical & Technology Institute of Nursing, Jaipur. The college is at a distance of 15 km from the Institute of Medical Technology and Nursing Education, Sitapura, Jaipur. The target population comprises B.Sc. Nursing students of the Medical & Technology Institute of Nursing, Jaipur.

INSTRUMENTS AND TOOLS FOR DATA COLLECTION

The structured knowledge administered questionnaire consists of two parts;

Part – I: Consist of selected socio-demographic variables such as age (in years), gender, studying in class, area of living, Source of information regarding prevention of hospital acquired infection.

Part – II: Consist of structured knowledge questionnaire on of Hospital acquired infection consists of 30 items on selected aspects.

Scoring

Each question has four options, one correct response and three wrong responses. A score of one was allotted to each correct response and a score of zero was given for wrong responses. Thus, the total knowledge questionnaire has minimum score of zero and maximum score of thirty.

Inadequate knowledge	0-49%
Moderate knowledge	50 - 74%
Adequate knowledge	more than 75%

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RESULT:

SECTION 1- DESCRIPTION OF DEMOGRAPHY PROFILE OF RESPONDENT

The 23 B.Sc. Nursing students (38.33%) belong to the age group of 17-18 years, 14 B.Sc. Nursing students (23.34) belong to the age group of 21-22 years, 12 B.Sc. Nursing students (20%) belong to the age group of 23 and above, 11 B.Sc. Nursing students (18.33) belong to the age group of 19-20 years.

The 54 B.Sc. Nursing students (90%) are males and 06 B.Sc. Nursing students (10%) are female. The 32 students (53.34%) are B.Sc. Nursing part -I, 12 students (20%) are B.Sc. Nursing part -II, 08 students (13.33%) are B.Sc. Nursing part –III and 08 students (13.33%) are B.Sc. Nursing Part IV. The 45 B.Sc. Nursing students (75%) belong to rural areas, and 15 B.Sc. Nursing students (25%) belong to an urban area.

Table:1: Distribution of B.Sc. Nursing students, according to the Source of Information regarding Hospital-acquired infection

Demographic Variables	**Category**	**N=60**	
		Frequency	**Percentage (%)**
Source Of Information regarding Hospital acquired infection	No information	06	10.00
	Friends & Family members	18	30.00
	Teachers	32	53.34
	Media	02	03.33
	Attend any training programme	02	03.33
Total		**60**	**100**

SECTION II-ASSESSMENT OF PRE-TEST KNOWLEDGE SCORE OF B.SC. NURSING STUDENTS REGARDING PREVENTION OF HOSPITAL-ACQUIRED INFECTION

Table 2: - Mean, median, and standard deviation of pre-test knowledge score

Variable	**N=60**		
	Mean	**Median**	**Standard Deviation**
Pre-test knowledge score	13.01666667	13	4.3754

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Table:3: Pretest knowledge score on different areas of prevention of hospital-acquired infection

S. No	Area of knowledge	Max score	N=60	
			Mean	SD
1.	Introduction, Causes, and Impact of Hospital-acquired Infections	9	3.5833	1.5736
2.	Reservoirs and transmission of infection,	7	2.1	0.9609
3.	Prevention of hospital-acquired infections and the role of nurses	14	7.3333	1.8409

Table 3 shows the mean and Standard deviation of pretest knowledge score on different areas of prevention of hospital-acquired infection. In the area of Introduction, Causes and Impact of Hospital-acquired infection, pre-test knowledge mean score is 3.5833 and SD is 1.5736. In the area of Reservoirs and transmission of infection, pre-test knowledge mean score is 7.3333 and SD is 1.8409. In the area of Prevention of Hospital-acquired infections and role of nurses' pre-test knowledge, the mean score is 2.1 and SD is 0.9690.

Table 4: Distribution of subjects according to pre-test level of knowledge regarding prevention of hospital-acquired infection.

Level of knowledge	Scores	N=60	
		Frequency	Percentage (%)
Inadequate knowledge	<50	37	61.67
Moderate knowledge	50-75	23	38.33
Adequate knowledge	>75	00	00
Total		**60**	**100**

The result showed B.Sc. Nursing students (38.33%) have moderate knowledge. B.Sc. Nursing students (61.67%) have inadequate knowledge, and (0%) have adequate knowledge regarding the prevention of hospital-acquired infection

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SECTION III- ASSESSMENT OF POST-TEST KNOWLEDGE SCORE OF NURSES REGARDING PREVENTION OF HOSPITAL-ACQUIRED INFECTION

Table 5: Mean, median, and standard deviation of post-test knowledge score (Maximum possible score=30)

Variable	N=60		
	Mean	Median	Standard Deviation
Post-test knowledge score	24.13	25	4.769

Table:5 shows the mean post-test knowledge score of B.Sc. Nursing students are 24.13. The median is 25, and the S.D. is 4.769.

Table:6- post-test knowledge score on different areas of prevention of hospital-acquired infection.

S. No	Area of knowledge	Max score	N=60	
			Mean	SD
1.	Introduction, Causes, and Impact of Hospital-acquired Infections	9	7.2833	1.2529
2.	Reservoirs and transmission of infection,	7	5.7	1.1299
3.	Prevention of hospital-acquired infections and the role of nurses	14	11.15	2.3862

Table 6 shows the mean and Standard deviation of post- test knowledge score on different areas of prevention of hospital-acquired infection. In the area of Introduction, Causes and impact of Hospital-acquired infection, post- test knowledge mean score is 7.2833, and SD is 1.2529. In the area of Reservoirs and transmission of infection, post- test knowledge mean score is 5.7, and SD is 1.1299. In the area of Prevention of Hospital-acquired infections and role of nurses' post-test knowledge, the mean score is 11.15 and the SD is 2.3862.

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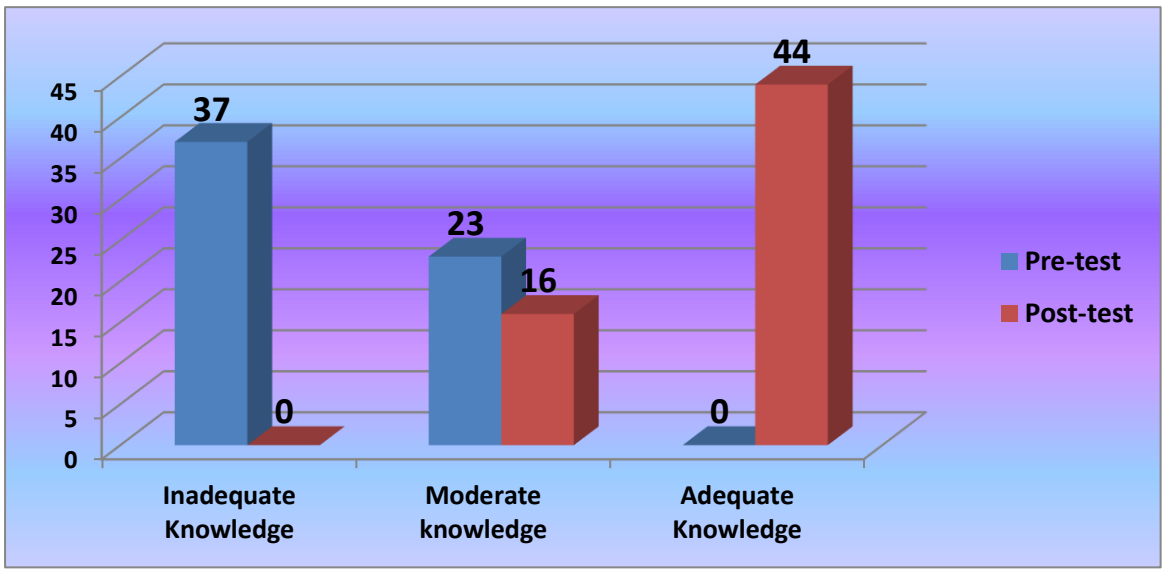
Table:7- Distribution of subjects according to post-test level of knowledge regarding prevention of hospital-acquired infection.

Level of Knowledge	Scores	N=60	
		Frequency	Percentage (%)
Inadequate knowledge	<50	0	00
Moderate knowledge	50-75	16	26.67
Adequate Knowledge	>75	44	73.33
Total		60	100

Table:7 showed B.Sc. Nursing students (00 %) have inadequate knowledge, B.Sc. Nursing students (26.67%) have moderate knowledge, and (73.33%) have adequate knowledge regarding the prevention of hospital-acquired infection.

SECTION IV- COMPARISON OF PRE-TEST AND POST-TEST KNOWLEDGE SCORES OF B.SC. NURSING STUDENTS REGARDING PREVENTION OF HOSPITAL-ACQUIRED INFECTION

Figure 1: Bar graph represents the percentage distribution of the sample according to the pre-test & posttest level of knowledge score.



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Tables:8- Mean, median and standard deviation of pre-test and post-test knowledge score

Variable	N=60		
	Mean	Median	Standard Deviation
Pre-test knowledge score	13.01	13	4.3754
Post-test knowledge score	24.13	25	4.769

Tables:8 Shows the comparison between the mean pre-test and post-test knowledge score of B.Sc. Nursing students. The data reveals that the mean and median of post-test knowledge score are higher than the mean and median of pre-test knowledge. The mean post-test knowledge score (24.13) is higher than the mean pre-test knowledge score (13.01)

Table:9- Area wise mean knowledge score, mean percentage and mean percentage gain score of pre-test and post-test knowledge score of B.Sc. Nursing students. N=60

Area of knowledge	Max score	Pre-test knowledge score	Post-test knowledge score	Gain score
		Mean score	Mean score	Mean score
Introduction Causes and impact of Hospital acquired infection	9	3.5833	7.2833	3.7
Reservoirs and transmission of infection	7	2.1	5.7	3.6
Prevention of Hospital acquired infections and role of nurses	14	7.3333	11.15	3.8167

Tables:9 - Data revealed that the area with the highest mean pre-test knowledge score is prevention of Hospital acquired infections and role of nurses (7.3333). The data indicate that the post-test mean knowledge scores in all areas are higher than the pre-test mean knowledge scores. The maximum percentage gain is prevention of Hospital acquired infections and role of nurses (3.8167).

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Figure 2: Line Chart Area wise mean percentage in pre-test and post-test and gain in knowledge score

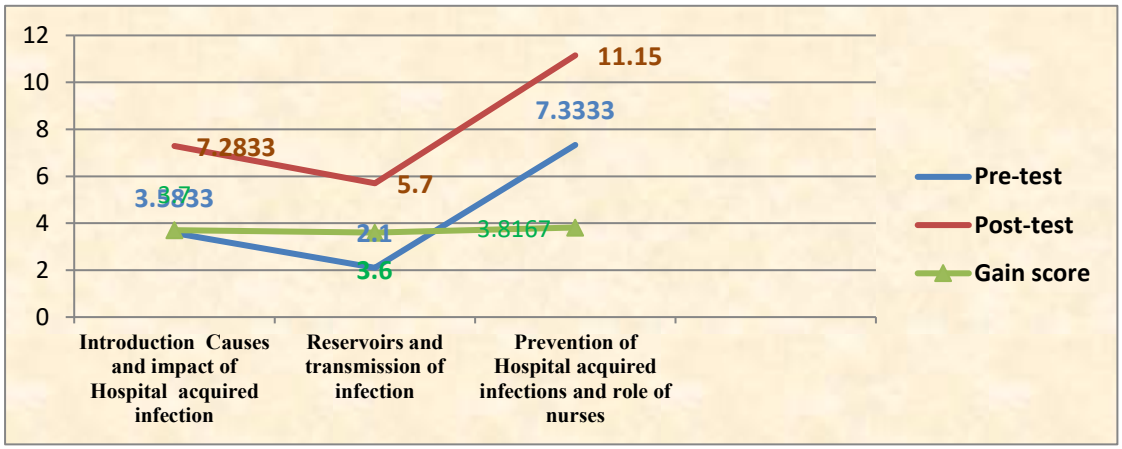

Table 10: Mean, mean difference, standard deviation difference, and‘t’ value of pre-test and post-test knowledge score N=60

Group	Mean knowledge score	Mean difference (MD)	Standard deviation difference (SDd)	‘t’ value
Pre-test	**13.01**	11.1166	3.020224	28.51073739
Post-test	**24.13**			

Significant at 0.05 level of significance at df (59) (t=2.00)

Table:10 shows that the mean post-test knowledge score (24.13) of the B.Sc. Nursing students is higher mean pre-test knowledge (13.01) with a mean difference of 11.1166, which is found to be statistically significant as evident from the obtained ‘t’ value of 28.51073739, which is more than the table ‘t’ value for df (59) at 0.05 level of significance. Thus, it is established that the difference obtained in the mean pre-test and post-test knowledge score is a true difference and not by chance, indicating that the self-instructional module is effective in increasing the knowledge of B.Sc. Nursing students regarding the prevention of hospital-acquired infections.

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SECTION V- ASSOCIATION BETWEEN POST-TEST KNOWLEDGE SCORE AND DIFFERENT DEMOGRAPHIC VARIABLES

Table :11- Association between pre-test knowledge score with demographic variables Age and Gender N=60

S. No	Variables	Df	x2	Table Value	Inference
1.	Age in years				
	17-18	**6**	1.755849	**12.592**	**S***
	19-20				
	21-22				
	23 and above				
2.	Gender				
	Male	**2**	0.187833	**5.991**	**S***
	Female				

S=significance, NS= Not Significance

The obtained x2 value (1.755849and 0.187833) at df (6 and 2.) are lesser than the table value which is indicate that is significant association between pre-test knowledge scores and demographic variables Age and Gender of the B.Sc. Nursing students df (6,2, $p<0.05$ level)

Table:12- Association between pre-test knowledge score with demographic variables Studying in class and Area of living N=60

S. No	Variables	Df	x2	Table Value	Inference
1.	Studying in class				
	B.Sc. Nursing part -I	6	1.021739	12.592	**S***
	B.Sc. Nursing part -II				
	B.Sc. Nursing part -III				
	B.Sc. Nursing part -IV				
2.	Area of living				
	Urban	2	0.014093	5.991	**S***
	Rural				

S=significance, NS= Not Significance

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The obtained x2 value (1.021739 and 0.014093) at df (6 and 2) are lesser than the table value which is indicate that is significant association between pre-test knowledge scores and demographic variables Studying in class and Area of living of the B.Sc. Nursing students df (6,2,p<0.05 level)

Table:13- Association between pre-test knowledge score with demographic variables Sources of information **N=60**

S. No	Variables	Df	x2	Table Value	Inference
1.	**Sources of information**				
	No information	8	8.193302	15.51	**S***
	Friends & Family members				
	Teachers				
	Media				
	Attend any training programme				

S=significance, NS= Not Significance

The obtained x2 value (8.193302) at (df 8) are higher than the table value which is indicate that is significant association between pre-test knowledge scores and demographic variables source of information of the B.Sc. Nursing students df (8, p<0.05 level)

CONCLUSION

The result shows that mean post-test knowledge score (24.13) of B.Sc. Nursing students is higher than mean pre-test knowledge (13.01) with a mean difference of 11.1166 which is found to be statistically significant as evident from the obtained 't' value of 28.51073739 which is more than the table 't' value for df (59) at 0.05 level of significance. Thus, it is established that the difference obtained in the mean pre-test and post-test knowledge score is a true different and not by chance, indicating that the self-instructional module is effective in increasing the knowledge of B.Sc. Nursing students regarding prevention of hospital-acquired infections.

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