

A STUDY TO ASSESS THE EFFECTIVENESS OF COMPUTER ASSISTED TEACHING ON KNOWLEDGE REGARDING PREVENTION OF SELECTED POST-OPERATIVE ORTHOPEDIC COMPLICATION AMONG B.Sc. 3rd YEAR STUDENTS IN SELECTED NURSING COLLEGE AT BANGALORE

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ABSTRACT

Introduction: Risks are inherent in every surgical procedure, and orthopedic procedures are no exception. The major complications are deep vein thrombosis, surgical site infection, bleeding, pulmonary embolism, pneumonia and pressure sore due to prolong immobilization which can be prevented if the nurse providing care has adequate knowledge about the actual and potential complications among orthopedic clients and the measures to prevent them. **Objectives:** To assess the effectiveness of computer assisted teaching regarding the prevention of selected postoperative orthopedic complications among BSc. 3rd year students at Indira Gandhi Collage of Nursing Bangalore. **Methods:** A Pre experimental one group pre-test and post-test study design was conducted among 60 nursing students using non- probability convenient sampling technique. A self-administered structured questionnaire was used to collect the data. The collected data was analyzed using descriptive and inferential statistics through SPSS version 16.0. **Result:** In pre-test 58.3% of the respondents had inadequate knowledge and 41.7% of the respondents had moderate knowledge none of the respondents had adequate knowledge. In post-test, 83.3% of the respondents had adequate level of knowledge, while 16.7% of the respondents had a moderate level of knowledge and none of the respondents had inadequate level of knowledge. The post-test knowledge mean score was 27.50 ± 2.8013 higher than the mean pre-test knowledge score 14.50 ± 3.462 . The calculated "t" value 21.02 and p-value ($<0.0001^{**}$) was less than tabulated value which is highly significant. The enhancement mean was 13. Hence the research hypothesis H_1 was accepted and null hypothesis H_0 was rejected. No association was found between the levels of knowledge with any demographic variables. **Conclusion:** Thus the study concluded that computer assisted teaching was significantly effective in increasing the knowledge on prevention of selected orthopedic complication among nursing students.

KEYWORDS: Knowledge, Computer assisted teaching, Student, prevention of selected postoperative orthopedic complication.

BACKGROUND OF THE STUDY

Orthopaedics constitutes a vast surgical field. With an ageing population and the associated increase in the prevalence of degenerative joint disease, more and more orthopaedic procedures are being performed especially in the field of joint replacement. Joint arthroplasties have offered a dramatic improvement in the quality of life of millions of patients. Risks are inherent in every surgical procedure, and orthopaedic procedures are no exception. However, during the 20th century, there has been a significant reduction in the number of complications owing to improved sterile techniques, prophylactic antibiotic use, early postoperative mobilization of the patient, prophylactic anticoagulation methods, and enhanced implant designs.^[1]

Orthopedic surgery is a service that provides those patients who are required treatment for fractures, deformities, and disease of injuries of some parts of the musculoskeletal system. The majority of patient required surgical interventions will be managed by bed rest, immobilization due to traction, fixation, application of plaster cast and rehabilitation. The possible complications arising after surgery in orthopedic patients are deep vein thrombosis, pulmonary embolism, pneumonia, infection pressure sore and many more others.^[2] The surgical population represents a major global health burden, with more than 300 million surgical procedures done annually and an early postoperative mortality rate of up to 4%.^[3]

Orthopedic, surgical site infection after implant surgery is a disaster both for the patients and nurse. This may lead to increased use of antibiotics, prolonged hospital stay, repeated debridement and prolonged rehabilitations, ultimately leads morbidity and mortality. Although postoperative complications incidents have been reduced due to modern facilities and aseptic measures in developed countries but still the rate of postoperative complications is high in developing countries like India. It is better to prevent complications like Infection, Deep vein thrombosis, pulmonary embolism, and Postoperative fever etc., rather than treating them.^[4]

In overcrowded country like India there are number of accidents which lead to number of casualties and hospitalization for orthopedic surgical management. After surgery nurses' role is very important to identify and prevent post-operative orthopedic complications.^[5] Inadequate knowledge is most hazardous than ignorance because the person who has inadequate knowledge may not be able to identify the deficiency properly, which in turn may lead to poor services resulting serious consequences. Similarly nurse with deficient knowledge may provide poor service in the care of postoperative orthopedic clients and the outcome will be more complications rather than their prevention.^[4]

As nurses are the persons who witness the complications after the orthopedic surgeries, she is in better position to prevent those complications and she is also the person who cares the client after occurrence of postoperative orthopedic complications. So researcher felt the need to assess the effectiveness of computer assisted teaching program on knowledge regarding prevention of selected postoperative orthopedic complication.

Objectives of the Study

1. To assess the level of pre-test knowledge regarding prevention of selected postoperative orthopedic complication among BSc, 3rd year students in selected college, Bangalore.
2. To assess the level of post-test knowledge regarding prevention of selected postoperative orthopedic complication among B.Sc. 3rd year students in selected college, Bangalore.
3. To evaluate the effectiveness of Computer Assisted Teaching regarding prevention of selected postoperative orthopedic complication among B.Sc. 3rd year students.
4. To find out the association between pre-test level of knowledge scores with selected demographic variables.

Hypothesis

H1: There's a significant difference in a pre-test and post-test level of knowledge regarding prevention of selected postoperative orthopedic complication among B.Sc. 3rd year students in selected college, Bangalore.

H2: There's a significant association between selected demographic variables and the pre-test knowledge scores

of B.Sc. 3rd year students regarding prevention of selected postoperative orthopedic complication.

METHODOLOGY

Research Design

Pre experimental Pretest - Posttest design was used to test the effectiveness of computer assisted teaching on knowledge regarding prevention of selected postoperative orthopedic complication.

Research Setting and Population

This study was conducted in Indira Gandhi college of Nursing, Bangalore. The population of this study includes all students of B.Sc. 3rd year in Indira Gandhi College of Nursing, Bangalore.

Sample: The sample size for this study is 60 B.sc 3rd year nursing students of Indira Gandhi College of Nursing between the age group of 18-26 years, who were available at the time of data collection and also who fulfill the inclusion criteria.

Sampling technique: Non probability convenient sampling technique was used for this study.

Instrumentation: The tool used for research study was self-administered structured questionnaire which was prepared after an extensive review of literature and discussion with the experts. The structured questionnaire consisted of two sections covering the following areas
Section A: This section consists of 4 items seeking information on demographic data which includes age, gender, religion and residential.
Section B: Self- structured questionnaire to assessing knowledge. The tool consists of 32 knowledge test items of multiple choice types.

Section C: Development of computer assisted teaching:
The title of the computer assisted teaching is on the prevention of selected postoperative orthopedic complication. The content in a self-instructional computer assisted teaching deal on knowledge about selected postoperative orthopedic complication its definition, types, risk factors, sign and symptoms, diagnostic investigation, its preventive measures and management. The knowledge regarding the selected postoperative orthopedic complication and its prevention was measured in terms of knowledge scores. Each correct scoring was given a score of one and wrong answers a score of zero. The maximum score was 32 and the minimum score was 0. It interprets level of knowledge the score was distributed as follows

1. Inadequate knowledge : < 50% (≤ 15)
2. Moderate knowledge : 50-75% (16-24)
3. Adequate knowledge : > 75% (≥ 25)

Pretesting of instrument was done in 10% (6 students) of total sample at Miranda Collage of Nursing Bangalore, for the feasibility of the tool. Instrument was revised and finalized on the basis of pretest and feedback. The

reliability co-efficient of the tool was calculated by using the Pearson's formula $r = 2r/1+r$, the calculated value of $r=0.78$. The developed tool was found to be highly reliable.

Data Collection Procedure: Prior to the commencement of the study, proposal approval and ethical clearance was obtained from Research Committee of Miranda Collage of Nursing Bangalore. Data was collected after getting ethical clearance from Committee of Miranda Collage of Nursing Bangalore and approval letter from Rajiv Gandhi University of Health Science, Karnataka, Bangalore. Researcher obtained the Formal written permission from the principle of Indira Gandhi College of Nursing, Bangalore prior to the study.

Before data collection, the purpose of the study was explained to the class teacher and students. The participants of study were 60 students (between the ages of 18-26 years) who were selected by convenient sampling method. Written informed consent was obtained from those who are willing to participate in the research study voluntarily. After the participants who agreed to participate were provided with a self-structured knowledge questionnaire set of questionnaires and Anonymity of each participant was maintained by using code number and briefing of the questions was done. The filled questionnaire was collected by the researcher herself after it is filled.

Phase 1: In this phase pretest was conducted on 12-6-2019 by distributing the self-administered structured

questionnaire about knowledge regarding the prevention of selected postoperative orthopedic complication and instructions were given on answering the questionnaire and doubts were clarified. Each subject took 5-6 minutes to answer demographic data and 30-35 minutes to fill the questionnaire.

Phase 2: In this phase the investigator gave computer assisted teaching on selected postoperative orthopedic complications and its prevention and instructions given by using A.V aids PPT among the same sample for improving their knowledge and doubts were clarified.

Phase 3: In this phase post test was conducted on 7th day on (pre-12-06-2019 / post-19-06-2019). After 7 days post-test was conducted by using the same self-structured questionnaire to reassess the knowledge.

Data Analysis Procedure: All collected data were coded, organized and entered into Statistical Package for Social Sciences (SPSS) 16.0 version. Data were analyzed by using descriptive statistics i.e. frequency, percentage, mean, range and standard deviation to determine the level of knowledge of nursing students regarding the prevention of selected postoperative orthopedic complication. Regarding inferential statistics, paired t test was used to analyze the effectiveness of computer assisted teaching on knowledge regarding the prevention of selected postoperative orthopedic complication. Chi-square test was used to determine the association between the pretest levels of knowledge and selected demographic variables.

RESULTS

Table 1: Socio-demographic Characteristics of the Respondents n=60.

S. No.	Demographic Characteristics	Frequency (n)	Percentage (%)
1.	Age in Years		
	18-20 years	17	28.3
	21- 23 years	43	71.7
2.	Gender		
	Female	47	78.3
	Male	13	21.7
3.	Religion		
	Hindu	44	73.3
	Muslim	9	15
	Christian	7	11.7
4.	Residential Area		
	Urban	36	60
	Rural	24	40

Table 1 shows that out of 60, majority of the respondents (71.7%) were in 21-23 age groups and more than one quarter (28.3%) were in 18-20 age groups. With regards to gender, maximum (78.3%) nursing student was female while only (21.7%) were male students. With regard to religion most (73.3%) of the nursing students were Hindu similarly only (15%) were Muslim only few (11.7%) were Christian. Likewise more than half (60%)

nursing students were from Urban area whereas less than half 40% were from rural area.

Table 2: Frequency and Distribution Regarding Level of Knowledge on Prevention of Selected Postoperative Orthopedic Complication. n = 60.

S.no.	Level of knowledge	Pre test		Post test	
		Frequency	Percentage (%)	Frequency	Percentage (%)
1	Inadequate knowledge	35	58.3	0	0
2	Moderate knowledge	23	41.7	10	16.7
3	Adequate knowledge	0	0	50	83.3
	TOTAL	60	100	60	100

Table 2 represents that, in the pre-test assessment more than Half (58.3%) of the respondents had inadequate knowledge while more than one third (41.7%) of the respondents had Moderate knowledge and none of the respondents had adequate knowledge. Regarding post-

test knowledge of the respondents after educational intervention, Majority (83.3%) of the respondents had an adequate level of knowledge, while only (16.7%) of the respondents had a moderate level of knowledge and none of the respondents had an Inadequate level of knowledge.

Table 3: Paired t-test Analysis for the Significance between overall Pre-Test and Post-Test Knowledge Regarding prevention of selected postoperative orthopedic complication n=60.

Aspect of Knowledge	Maximum Score	Mean	Mean Difference	Range	Standard Deviation	Mean %	T value	p-value
Pretest	23	14.50	13	16	3.462	63.04%	21.020	<0.0001**
Posttest	32	27.5		11	2.80133	85.94%		

p-value significant at <0.05 /p-value not significant at >0.05

Table 3 shows that the knowledge score gained by respondents in the results shows that the mean value of knowledge in the pre-test was 14.50 ± 3.462 and in the post-test was 27.50 ± 2.80133 . Since the “p” value for the test is <0.05. The calculated ‘t’ value was 21.02 which shows that there was a significant difference between the mean pre-test and mean post-test knowledge score. This shows that the obtained mean difference of

pre-test and post-test knowledge scores was a true difference and not by chance and the calculated ($p < 0.0001^{**}$) p-value is less than tabulated value. So, it can be concluded that the CAT is effective for imparting knowledge on prevention of selected postoperative orthopedic complication. i.e research hypothesis is accepted.

Table 4: Association between Pretest Level of Knowledge and Selected Demographic Variables N=60.

Variables	Inadequate Education	Moderate Education	χ^2 value	p-value
Age (In Years)				
18-20	10	7	0.002	0.961
21-23	25	18		
Gender				
Female	28	19	0.137	0.711
Male	7	6		
Religion of Participants				
Hindu	25	19	0.156	0.693
Non hindu	10	6		
Residential Area				
Rural	14	10	0.073	0.787
Urban	21	15		

Note: S-significant ($p < 0.05$), NS-Not significant ($p > 0.05$).

Table 4 reveals that there is no association between pretest level of knowledge and selected demographic variables. None of the demographic variables i.e., age, gender, religion and residential areas were not found statistically significant with pretest level of knowledge as calculated value is more than tabulated value. Hence research hypothesis is rejected.

DISCUSSION

The findings of the present study revealed that in the pre-test assessment, (41.7%) of the respondents had

moderate level of knowledge while more than half (58.3%) of the respondents had inadequate knowledge. Whereas, in post-test knowledge of the respondents after computer assisted teaching, majority (83.3%) of the respondents had adequate level of knowledge and only (16.7%) of the respondents had moderate level of knowledge and none of the respondents had inadequate level of knowledge regarding prevention of postoperative orthopedic complication. This finding is supported by a study conducted by Sahu R, et.al (2017).^[7] which revealed that in pre- test knowledge score of the B.Sc.

nursing intern's 6.67% were very good, 91.67% were good and only 1.66% were average and regarding post-test results, majority (66.67%) were very good and 33.33% were good. Another study conducted by Suresh JT *et al.*^[9] also support the findings of present study which revealed that maximum (80%) nurse had average knowledge, 15% had good knowledge and remaining (5%) had poor knowledge. None of the subjects found to have excellent knowledge. After the structured teaching programme the post-test showed that the maximum nurse (67.5%) had excellent knowledge and 32.5% had gained good knowledge and none of the sample had inadequate knowledge.

The findings of the present study showed that with regard to pretest knowledge mean percentage was 63.04% and with regard to posttest knowledge mean percentage was 85.94%. There was a increment of 23%. This finding is in line with the study conducted by Carides MK. (2021).^[8] which also showed that mean scores for the pretest was 74% while the mean scores for the posttest was 96% and there was a increment of 22% in overall scores following the educational intervention.

In this study, post-test knowledge mean score (27.50 ± 2.8013) was higher than mean pre-test knowledge score (14.50 ± 3.462). The calculated 't' value (21.02) and p-value ($p < 0.0001^{**}$) was less than tabulated value which is highly significant ($p < 0.05$). The finding concluded that the computer assisted teaching programmed was effective in increasing mean value of knowledge among B.Sc. 3rd year nursing students on prevention of selected postoperative orthopedic complications. This finding is supported by a study conducted by Khudhayer HF, Atiyah HH.(2019)^[6] which also showed that the knowledge score of nursing staff was inadequate in the pre-test but knowledge score was highly increased after giving them the educational program. Likewise another supported study conducted by Suresh JT.(2018)^[9] revealed that the mean score among nurses was 15(46%) during pretest rose up to 24(77.60%) in the post test evaluation. Result interpreted that there was a significant increase in knowledge level of nurses after administration of structured teaching program. This indicates that planned teaching was effective in improving the knowledge of the nurses. Whereas another supported study conducted by Sahu R, *et al.* (2017)^[7] concludes that pre-test mean score was (16.55 ± 2.84) lower than the post-test mean score (22.11 ± 2.41). T-value (2.02) is highly significant at > 0.05 . The study concluded that the planned teaching programme was effective to increase knowledge level of B.Sc nursing intern's. In addition a study conducted by Parmar G. (2017)^[2] concluded that mean posttest knowledge score 23.21 was higher than mean Pretest knowledge score 10.16 with the mean difference of 13.05. The mean posttest knowledge score is significantly higher than the mean pretest knowledge score with the mean difference of 13.05 and the calculated t' value (23.33) was greater than tabulated t' value (2.02) which was statistically

proved that the planned teaching programme was effective to increase nurses knowledge regarding prevention of complication of immobilized orthopedic patients.

The finding of the present study showed that there was no significant association between pre-test knowledge scores with selected demographic variable i.e., age ($p > 0.961$), gender ($p > 0.711$), religion ($p > 0.693$), residential ($p > 0.787$). This finding is supported the study conducted by Khudhayer HF, Atiyah HH.(2019)^[6] which indicated that there was no significant relationship between nurses' knowledge and age, gender, educational level and years of experience of nurses in orthopedic wards. Another study conducted by Parmar G. (2017)^[2] and Suresh JT. (2018)^[9] contradicts the findings of the present study which revealed that there was significant association with pre-test knowledge scores and selected demographic variables.

CONCLUSION

The findings of the study concluded that the computer assisted teaching was effective in improving knowledge of nursing student regarding the prevention of selected postoperative orthopedic complications. The CAT helped the students to ask the questions regarding the prevention of selected postoperative orthopedic complications and the process of undergoing this counseling and clarifying their doubts. It also helps them to upgrade their knowledge on prevention of selected postoperative orthopedic complications.

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