



EFFECT OF STRUCTURED TEACHING MODULE (STM) ON CARE OF PATIENTS WITH CARDIAC IMPLANTABLE ELECTRONIC DEVICES AMONG STAFF NURSES WORKING IN SELECTED TERTIARY CARE HOSPITALS

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ABSTRACT

Background: Cardiac Implantable Electronic Devices (CIEDs) are increasingly used in the management of arrhythmias and heart failure. Nurses play a critical role in the care and education of patients with CIEDs; however, inadequate knowledge may affect patient outcomes. **Aim:** To determine the effectiveness of a Structured Teaching Module (STM) on the knowledge of staff nurses regarding the care of patients with CIEDs. **Methods:** A quantitative, quasi-experimental, non-randomized control group design was adopted among 160 staff nurses working in selected tertiary care hospitals of the Vidarbha region, Maharashtra. Convenience sampling was used to select 80 nurses each for the experimental and control groups. Data were collected using a structured self-administered questionnaire before and after the intervention. Descriptive and inferential statistics (t-test and one-way ANOVA) were used for analysis. **Results:** The overall pre-test knowledge score was 32% in the control group and 53% in the experimental group. Following the STM intervention, the experimental group demonstrated a marked improvement, with the overall knowledge score increasing to 77%, whereas the control group showed minimal change. A highly significant difference was observed between pre-test and post-test scores in the experimental group ($t=60.04$, $p<0.001$). **Conclusion:** The Structured Teaching Module was effective in improving staff nurses' knowledge regarding the care of patients with CIEDs and should be incorporated into continuing nursing education programmes.

KEYWORDS: Cardiac Implantable Electronic Devices, Structured Teaching Module, Staff Nurses, Knowledge, Nursing Education, Tertiary Care Hospitals.

INTRODUCTION

The cardiac conduction system is the network of nodes, involves the spread of electrical activity from the sinoatrial node, to the atrioventricular node, down the bundle of His and along the Purkinje fibers. As the electrical activity spreads along the heart, it initiates the contraction and relaxation of heart which complete the one heartbeat.^[1]

if any change from the normal sequence of electrical impulses may leads to arrhythmia.^[2]

Although most of the arrhythmias are non-serious, but some arrhythmias like Atrial fibrillation, atrial flutter, paroxysmal supraventricular tachycardia (PSVT),

Premature atrial contractions, Premature ventricular contractions (PVCs), Accessory pathway tachycardia's can be serious or even life threatening.^[3]

These type of arrhythmias, there is a need of Cardiac implantable electronic devices (CIEDs) to control the heart rate and rhythm.^[4]

An artificial pacemaker establishes effective circulation and near normal hemodynamics by providing an appropriate heart rate and heart rate response. Implantable cardioverter defibrillators (ICDs) provide antitachycardiac pacing (ATP) for termination of ventricular tachycardia (VT) and high-voltage shock, which are used to defibrillate ventricular fibrillation

(VF). Cardiac resynchronization therapy (CRT) or biventricular devices contain all capabilities of standard pacemakers and ICDs in addition to correcting interand intraventricular desynchrony.^[5] Among all the problem most of the patients receiving pacemakers, ICDs (implantable cardioverter defibrillator) and combination devices, a need for multidisciplinary approaches to meet these population specific needs has become obvious. Nurses who have a holistic outlook on patient care can play a key role in this by supporting patients and their families during and after implantation. the nursing staff can address the immediate concern of the patient and help them cope successfully with their new life situation.^[6]

OBJECTIVES OF THE STUDY

1. To assess the knowledge of staff nurses regarding the care of patients with CIEDs in experimental and control groups before intervention.
2. To determine the effectiveness of the Structured Teaching Module among staff nurses in the experimental group.
3. To determine the association between post-test knowledge scores and selected demographic variables.

HYPOTHESES

H1: There is a significant difference between pre-test and post-test knowledge scores in the experimental and control groups.

H2: There is a significant difference between post-test knowledge scores of staff nurses in the experimental and control groups.

H3: There is a significant association between post-test knowledge scores and selected demographic variables in the experimental group.

MATERIALS AND METHODS

Research Design: Quasi-experimental non-randomized control group design.

Setting: Selected tertiary care hospitals in the Vidarbha region, Maharashtra.

Sample Size: 160 staff nurses (80 experimental and 80 control).

Sampling Technique: Convenience sampling.

Data Collection Tool: Structured self-administered questionnaire on care of patients with CIEDs.

Statistical Analysis: Descriptive statistics, paired and unpaired t-tests, and one-way ANOVA using SPSS software.

RESULTS: Collected data from staff nurses was planned to analyze by using descriptive and inferential statistics.

The descriptive statistics includes; percentage, mean, mean percentage and standard deviation. The inferential statistics includes; t test and one-way ANOVA using SPSS software. However, the tabulated data were planned to analyze under following heading –

SECTION-I: Distribution of staff nurses according to their demographic variables in experimental and Control group.

Demographic Variables	Control Group(n=80)	Experimental Group(n=80)
Age(yrs) of parents		
25-30 yrs	54%	80%
31-40yrs	25%	20%
41-50 yrs	16%	0%
≥51 yrs	41%	0%
Gender		
Male	6%	9%
Female	94%	91%
Religion		
Hindu	19%	63%
Muslim	15%	9%
Buddhist	34%	14%
Christian	23%	14%
Qualification		
G.N.M.	65%	69%
BSc. Nursing	5%	15%
Post BSc. Nursing	20%	16%
Specialized Certificate Course	0%	0%
Professional Experience		
5 year &Below	56%	55%
6-10 yrs	25%	43%
11-15 yrs	18%	3%
≥ 16 yrs	4%	0%

SECTION-II: Assessment of knowledge on care of patient with CIEDs among staff nurses before intervention in experimental group and control group.

Area Of Knowledge.	Number of items	Knowledge in %	
		Control group	Experimental group
General Information related to CIEDs	09	43 %	43%
Indication of CIEDs	02	28%	45%
Types and benefits of CIEDs	04	35%	88%
Care of patient with CIEDs	15	24%	36%
Overall	30	32%	53%

SECTION III: Assessment of knowledge on care of patient with CIEDs among staff nurses after intervention in experimental group and control group.

Level Of Knowledge.	Control Group				Experimental Group			
	Pre-test		Post-test		Pre-test		Post-test	
	f	%	f	%	f	%	f	%
Very Poor	11	14%	3	4%	0	0%	0	0%
Poor	55	69%	75	94%	35	44%	0	0%
Average	14	18%	2	3%	45	56%	0	0%
Good	0	0%	0	0%	0	0%	54	68%
Excellent	0	0%	0	0%	0	0%	26	33%
Overall	80	32%	80	28%	80	53%	80	77%

SECTION IV: Significant difference in the post-test knowledge scores on care of patient with CIEDs among staff nurses in control and experimental group.

n=160

Group	Test	Mean	SD	Mean difference	df	't'	'p'
Control	Pre-test	8.6	2.54	0.902	79	3.109	0.003
	Post-test	9.21	1.74	0.198			
Experimental	Pre-test	11.95	1.71	11.97	79	60.04	0.000
	Post-test	23.54	2.26	11.203			

SECTION V: Association between post-test knowledge scores on care of patient with CIEDs and demographic variables of staff nurses in experimental group.

Association between post-test knowledge score and age.

n=80

Age in years	F	'f' value	'P' value
21-30 yrs	64	1.011	0.439 NS p>0.05
31-40yrs	16		
41-50yrs	0		
≥51yrs	0		

df-9,70 P table value - 0.0001* significant NS-Not significant

Association between post-test knowledge score and gender.

n=80

Gender	F	'f' valu	'p' value
Male	7	2.047	0.046***S P<0.05
Female	73		

df – 97.0, table value - 0.0001*** highly significant, S- significant.

Association between post-test knowledge score and religion.

Religion	F	Mean &SD	F value	Pvalue
Hindu	50	30.1+3.0	0.664	0.738 NS p>0.05
Muslim	7	31.8+ 2.5		
Buddhist	11	29 + 2.4		
Christian	12	30.5 + 2.6		
Other	0	0		

df - 79, table value - 0.738, NS- not significant

Association between post-test knowledge score and qualification.

Qualification	F	Mean & SD	'f' value	'P' value
GNM	55	30.1±2.8	0.443	0.907 NS p>0.05
B. Sc. (N)	12	30.4±3.5		
P B B. Sc (N)	13	29.9±2.9		
Specialized certificate course	-	-		

df - 79, table value 0.907, NS- not significant.

Association between post-test knowledge score and working experience.

Work Experience	F	Mean & SD	'f' value	'P' value
5 years & below	44	29.8±3.1	1.279	0.264 NS p>0.05
6 -10 years	34	30.6±2.5		
11 - 15 years	2	29.5±3.5		
16 years & above	0	-		

df - 79, table value - 0.264, NS- not significant

ANALYSIS AND INTERPRETATION**Pre-test knowledge score****Table 1: Assessment with level of pre-test knowledge score.**

Level of Pre Test knowledge Score	Score Range	Level of Pre Test knowledge Score	
		Control Group(n=80)	Experimental Group(n=80)
Poor	0-6	55	35
Average	7-12	14	45
Good	13-18	0	0
Very Good	19-24	11	0
Excellent	25-30	0	0
Minimum score		3	5
Maximum score		26	22
Mean knowledge score		5.2±0.73	4.7±0.50
Mean % knowledge score		(5.4±1.3) 32%	(3.6±2.1) 53%

Distribution of knowledge scores of staff nurses before intervention reveals that around one fourth 55 (69.1%), 11(14%) had poor knowledge, 14(18%) had average knowledge in control group whereas none of them had good, very good or excellent knowledge. However, the overall knowledge before intervention was 32% in control group (table - 1). With regard to experimental

group, highest 45 (56%) nurses had average knowledge whereas none of them had good or excellent knowledge. However, the nurses with very poor and poor knowledge were 0(0%) & 35(44.2%) respectively. Altogether, the nurse's knowledge before intervention was 53 % in experimental group.

Table 2: Comparison of knowledge scores on care of patient with CIEDs among staff nurses in experimental and control group after intervention.

n=160

Level of Knowledge	Control Group				Experimental Group			
	Pre-test		Post-test		Pre-test		Post-test	
	f	%	f	%	f	%	f	%
Very Poor	11	14%	3	4%	0	0%	0	0%
Poor	55		75	94%	35	44%	0	0%
Average	14	18%	2	3%	45	56%	0	0%
Good	0	0%	0	0%	0	0%	54	68%
Excellent	0	0%	0	0%	0	0%	26	33%
Overall	80	32%	80	28%	80	53%	80	77%

With regard to control group, none of the nurses had good or excellent knowledge in pre- test whereas in the post-test it was significantly increased to 80(77%). On contrary, the nurses with average and poor knowledge were 14(18%) & 55 (69%) respectively in pre-test whereas it was more or less similar 2 (3%) & 75 (94%)

in post-test without making any significant difference in the values. And very poor score in pretest and post is 11(14%) & 3 (4%) respectively Further, none of them had very good or excellent knowledge neither in pre-test nor post-test. With regard to experimental group, none of the nurses had very good or excellent knowledge in pre-

test, whereas in post-test it was significantly increased to 80(53%) & 80 (77%) making a huge difference in the percentages of knowledge. In addition, the staff nurses with excellent knowledge in pretest or posttest is 0(0) % & 26(33%) However, after an intervention, no nurses remained with very poor, poor, average knowledge in

experimental group (table - 2). Hence, it was interpreted that the huge difference in knowledge percentage in experimental group was due to an effect of Structured teaching module on care of patient with CIEDs. Whereas a slight knowledge variation in control group was negligible as that might have occurred by chance.

Table 3: Significant difference between the post-test knowledge scores of control and experimental group. n=80

Group	Test	Mean Difference	df	't' Value	'p' Value
Control	Post- test	14.490	79	48.7	0.0001 p<0.05
Experimental	Post-test				

Df-79, table value<0.0001***highly significant, table value<0.001 moderately significant table value 0.05* significant.

Unpaired 't' test was computed to find out the significant difference between the post-test knowledge scores of control and experimental group. Highly significant difference ($p<0.0001$) was found between the post -test of control group and experimental group with a calculated 't' value of 48.7 (table:3). Hence, it was interpreted that highly significant difference between the post- test knowledge score was due to an effect structured teaching module through STM on care of patient with CIEDs among staff nurses. Therefore, the STM as a teaching tool on care of patient with CIEDs among staff nurses was considered as effective. However, a difference observed between the post-test knowledge score value in control group and experimental group was true difference; hence research hypothesis is accepted.

DISCUSSION

The study findings indicate that educational interventions significantly improve nurses' knowledge regarding CIED care. Similar findings have been reported in previous studies highlighting the need for continuous professional education in this rapidly evolving area of cardiac care.

CONCLUSION

The Structured Teaching Module was effective in improving knowledge regarding care of patients with CIEDs among staff nurses. Incorporating structured educational programmes into regular in-service training may enhance nursing competency, patient safety, and quality of care.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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