A Study to Assess the Effectiveness of Structured Teaching Programme (STP) on Knowledge Regarding Cardiopulmonary Resuscitation (CPR) among B. Sc. Nursing Students in Selected Nursing Colleges of Punjab

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Abstract: *A Quasi-experimental study with pre-test and post-test was conducted to assess the Effectiveness of Structured Teaching Programme (STP) on knowledge regarding Cardiopulmonary Resuscitation (CPR) among B. Sc. Nursing students in selected nursing colleges of Punjab. Quasi-experimental one group pre-test post-test experimental design was adopted for this study. A Structured Knowledge Questionnaire regarding CPR was prepared and used to collect the data. The data was analyzed and interpreted in terms of the objectives of the study. Descriptive and Inferential statistics were used for data analysis. Result of the study was that comparison of level of knowledge of pre-test and post-test shows that in pre-test majority of students lies in Average category i. e.60% B. Sc. Nursing students and in post-test majority of students lies in Good category i. e.96% B. Sc. Nursing students. Comparison of Mean, Standard Deviation and Standard Error Mean of pre-test and post-test knowledge scores shows that Pre-test mean score is 24.54 whereas in Post-test is 18.00 revealing the difference of 6.54 shows the effectiveness of STP. Paired 't' test was calculated to assess the Pre-test and Post-test knowledge scores of B. Sc. Nursing students, the findings show highly significant difference of Pre-test and Post-test knowledge scores of B. Sc. Nursing students regarding Cardiopulmonary Resuscitation (CPR). It shows the Structured Teaching Programme (STP) is effective. Chi square was calculated to find out the association between the level of knowledge scores and demographic vary of the B. Sc. Nursing students, No significant association was found. The present study shows that the STP was effective in improving the knowledge regarding CPR among B. Sc. Nursing students.*

Keywords: Assess, Effectiveness, Structured Teaching Programme, Cardiopulmonary Resuscitation, Knowledge, Students

1. Introduction

The heart is a muscular organ having two atriums and two ventricles that provides the force necessary to circulate the blood to the body. Its function is vital because it supply oxygen and nutrients to the tissues and remove CO_2 and other wastes in the body. The heart also contains electrical "pacemaker" cells, which causes it to contract and relax – producing a heartbeat. Deprived of its necessary functions, cells soon undergo irreversible changes that leads to death. Cardiac arrest is a sudden loss of blood flow resulting from the failure of the heart to pump effectively. Abnormal heart rhythm is often a cause of cardiac arrest called Ventricular Fibrillation. The victim of cardiac arrest, ventricular fibrillation and various heart diseases needs Cardiopulmonary Resuscitation (CPR) and Defibrillation. CPR is an emerging life-support procedure and applied to prevent irreversible brain damage or death in the case of cardiac arrest. CPR is the first line treatment for the person who is unresponsive, suffering from cessation of respiration, development of cyanosis and pallor skin, absence of heart sounds and blood pressure, loss of palpable pulse. "Cardio" refers to the heart function and "Pulmonary" refers to the lung function. CPR is a combination of chest compressions and rescue breathing. " Resuscitation" is the medical term that means "to revive" or "bring back to life". It is the ultimate full body ischemia reperfusion injury affecting multiple organ systems including brain and heart. If the CPR is initiated within 4 minutes of cardiac arrest the survival rate is 43%, when initiated within a 4-8 minutes the survival rate is 10%. So, it becomes inarguably essential that medical students, nursing students to have updated knowledge on CPR maneuver in order to provide a satisfactory care. Importance of CPR of sudden cardiac arrest is a leading cause of death, approximately 50, 000 per annum outside a hospital setting in the U. S. A. According to the American Heart Association only 2/3rd of victims of a witnessed cardiac arrest are administered CPR. Over the 11 years period overall incidence of CPR was 21.9 per 10, 000 procedures. This rate decreased from 33.9 per 10, 000 after 1995. Overall survivals to hospital discharge after CPR was 56.1%.

1.1 Objectives of the study

- To assess the level of knowledge regarding Cardiopulmonary Resuscitation (CPR) among B. Sc. nursing students, before and after administration of Structured Teaching Programme (STP) regarding Cardiopulmonary Resuscitation (CPR).
- To evaluate the effectiveness of STP regarding CPR among B. Sc. nursing students by comparing Pre-test and Post-test knowledge scores.
- To find out the association between knowledge regarding CPR among B. Sc. nursing students with the selected demographic variables.

1.2 Hypothesis

H[1]: There will be significant difference between Pre-test and Post-test knowledge scores of B. Sc. nursing students regarding CPR.

H[2]: There will be significant association between the Post-test knowledge scores with demographic variables of the B. Sc. nursing students (such as age, sex, religion, previous knowledge about CPR, source of information, place of stay).

2. Conceptual Framework

The present study is based upon J. W. Kenny's open system model.

2.1 Review of Literature

Meena (2019) conducted the study to evaluate the effectiveness of Structured Teaching Programme on knowledge regarding Cardiopulmonary Resuscitation in adult among student nurses (GNM 3rd Year) in a selected School of Nursing, Dehradun, Uttarakhand. The sample size of the study was total 70 student nurses (GNM 3rd year) from state school of nursing and combined institute medical science and sampling technique for this study is non probability convenience Sampling. The data indicates that 18.57% had poor knowledge, while majority 82.85% percent had average knowledge and none of them had good knowledge in pre-test. The knowledge score of GNM 3rd year Students in post-test shows majority i. e., 100% percent acquired good knowledge while, none of the student had average and poor knowledge. Thus, it can be integrated the increase in knowledge may be on the effectiveness of structured teaching Programme on cardiopulmonary Resuscitation in adult. Standard deviation of knowledge in pre-test and post-test. The mean Pre-test Knowledge score of the GNM 3rd year students is 14.44 with a standard deviation of 3.578 has increased to the 28.36 with a standard deviation 1.745 is a measure of spread of scores within a set of data. The large standard deviation indicates greater variability in the data whereas smaller standard deviation indicates less variability in the data.

Rekha Koranga (2019) conducted a study to assess the effectiveness of Structured Teaching Programme regarding cardiopulmonary resuscitation among undergraduate students at the selected Colleges of Dehradun, Uttarakhand. The data was collected from 75 samples selected randomly. Findings of the present study showed that the mean post-test score (25.80±3.0) was higher than pre-test mean score (13.18±3.3). Arbitrary score reviled that, in pre-test majority of the undergraduate (UG) students had (60.65%) average knowledge, most of the UG students had (36.06%) poor knowledge, only (3.27%) had the good level of knowledge. Where in post-test, maximum students had very good knowledge (62.92%), most UG students had 36.06% good Knowledge and only 1.63% had average knowledge which showed that the knowledge had increased after administration of STP, calculated 't' value was 19.327 and found highly significant P<0.001.

Deepa. PD (2011) conducted a study to evaluate the effectiveness of Structured Teaching Programme regarding cardiopulmonary resuscitation among B. Sc. (N) 2nd year students in P. G. College of nursing, Gwalior, Madhya Pradesh. The data was collected in the form of questionnaire. The results indicate that pre-test score was 43.37% and after the implementation of Structured Teaching Programme the score was 79.175%. The mean score of post-test knowledge was 31.7, higher than mean pre-test knowledge was 24.4.

Ms. Anbu Epsi. J. (2015) conducted the study to assess the effectiveness of Structured Teaching Programme on knowledge regarding Cardiopulmonary Resuscitation among degree students in a selected college, Komarapalayam. The sample size was 50 students in a selected college, Komarapalayam. The study findings revealed that (01) 02% of students had very poor knowledge, (26) 52% of students had poor knowledge, (22) 44% of students had average knowledge and the remaining (01) 02% had good knowledge. The study findings revealed that comparison of overall mean, SD and mean percentage of pre-test and post-test knowledge scores shows that over all pre test mean score was 18.6+-4.14 which is 41.33% whereas in post-test the mean score was 35.8+-3.5 which is 79.5% revealing the difference of 38.17% shows the effectiveness of STP.

Hassan Zaheer and Zeba Haque (2002) conducted a cross sectional study regarding the effectiveness of Structured Teaching Programme on Cardiopulmonary resuscitation. The sample of the study was 61 students. The finding of the study was only 9 students out of 61 has taken CPR Structured Teaching Programme while 52 students has not attended Programme. 4% of the student had complete knowledge about the CPR. Among the students who had taken teaching, 22% had complete knowledge about CPR (p<0.05). Significantly less numbers of students knew about the CPR 21%.

3. Methodology

Research methodology provides a brief description of the method adopted by the investigator in the study.

3.1 Research Approach

Quantitative Research Approach was used for the present study. Under this approach, Quasi-experimental Research Design involves the manipulation of independent variable to observe the effect on dependent variable.

3.2 Research Design

Research Design adopted for the study is Quasi-experimental Research Design (One-group pre-test post-test Design).

3.3 Research Settings

Research Setting of the present study was conducted among the B. Sc. Nursing students at State Institute of Nursing and Paramedical Sciences, Badal, Sri Muktsar Sahib, Punjab.

3.4 Target Population

The target population for the study was B. Sc. Nursing students of 2nd and 3rd years of State Institute of Nursing and Paramedical Sciences, Badal, Sri Muktsar Sahib, Punjab.

3.5 Sample Size and Sampling Technique

The sample size for the present study is 50 B. Sc. nursing students and Non-probability purposive sampling technique is used to select the sample for this study.

3.6 Criteria for Selection of the Sample

3.6.1 Inclusion Criteria
- B. Sc. Nursing 2nd and 3rd year students of SINPMS, Badal.
- Nursing students who are willing to participate.

3.6.2 Exclusive Criteria
- Nursing students included in Pilot Study.
- Nursing students who are not willing to participate.
- Nursing students of other years of B. Sc. Nursing students.

3.7 Description of the Research Tool
The tool used for the study were:
- Close ended questionnaire to assess the knowledge regarding CPR among the B. Sc. Nursing students.
- Structured Teaching Programme (STP) regarding CPR.

The questionnaire consists of two parts:
Section A: It consists of questionnaire regarding demographic characteristics such as Age, Sex, Religion, Previous knowledge about CPR, Source of Information, Place of stay.

Section B: It consists of questionnaire to assess the knowledge regarding CPR. This section consists of 30 questions. Each question has four options with one most correct answer. For each question, the correct answer carries the score of 'one' and wrong answer carries the score of 'zero'. Therefore 30 questions there was 30 maximum obtainable score.

Scoring Procedure: To assess the level of knowledge of students, the score was grouped into categories like Poor, Average and Good based on knowledge scores.

3.8 Validity of the Tool

Content Validity of the tool was determined by the experts. All the comments and the suggestions given by the experts were duly considered and modification was made after careful review and discussion with experts, guide and co-guide and tool was finalized.

3.9 Ethical Consideration

Prior to the data collection, written permission was obtained from the Research and Ethical Committee of State Institute of Nursing and Paramedical Sciences, Badal.

3.10 Pilot Study

The Pilot Study was conducted among 5 students at College of Nursing, AIMS, Sri Muktsar Sahib, Punjab.

3.11 Reliability of the Tool

It was determined by the test-retest method which included Karl Pearson's Correlation Coefficient formula. The r value was $r = 0.976$. This, it was reliable.

3.12 Data Collection Procedure

The data was collected in following three steps:
- Pre-Test
- Implementation of STP
- Post-Test

3.13 Data Analysis

The collected data was analyzed through Descriptive and Inferential statistics according to the objectives of the study.

4. Result

The data for analysis is organized and presented based on the objectives of the study under sections:

Section 4.1: Descriptive Analysis of Demographic Variables of study subject.

Table 1: Frequency and Percentage distribution of students according to the demographic variables

S. No.	Demographic Variables		Frequency	Percentage
1.	Age	17 to 18	1	2
		19 to 20	34	68
		21 to 22	14	28
		23 to 24	1	2
2.	Sex	Male	0	0
		Female	50	100
3.	Religion	Hindu	14	28
		Sikh	33	66
		Muslim	1	2
		Any Other	2	4
4.	Previous knowledge about CPR	Yes	50	100
		No	0	0
5.	If yes, source of information through	Media	0	0
		Books	26	52
		Teachers	20	40
		Health Professionals	4	8
6.	Place of Stay	Home	7	14
		Hostel	43	86
		PG	0	0

N = 50

Section 4.2: Level of Knowledge of B. Sc. Nursing students regarding CPR

Table 2.1: Level of Knowledge of B. Sc. Nursing students regarding CPR prior to implementation of STP

| Level of Knowledge	Min.-Max. Obtainable Score	Frequency	Percentage
Poor	0-10	4	8%
Average	11-20	30	60%
Good	21-30	16	32%
Total		50	100%

Table 2.2: Level of Knowledge of B. Sc. Nursing students regarding CPR after implementation of STP

Level of Knowledge	Min.-Max. Obtainable Score	Frequency	Percentage
Poor	0-10	0	0
Average	11-20	2	4%
Good	21-30	48	96%
Total		50	100%

Section 4.3: Comparison of Pre-Test and Post-Test knowledge scores of the B. Sc. Nursing students regarding CPR to assess the effectiveness of STP.

Table 3.1: Comparison of Level of Knowledge of Pre-Test and Post-Test scores of the B. Sc. Nursing students regarding CPR in terms of Frequency and Percentage distribution

Level of Knowledge	Min-Max Obtainable Score	Frequency		Percentage Distribution	
		Pre-Test	Post-Test	Pre-Test	Post-Test
Poor	0-10	4	0	8%	O%
Average	11-20	30	2	60%	4%
Good	21-30	16	48	32%	96%
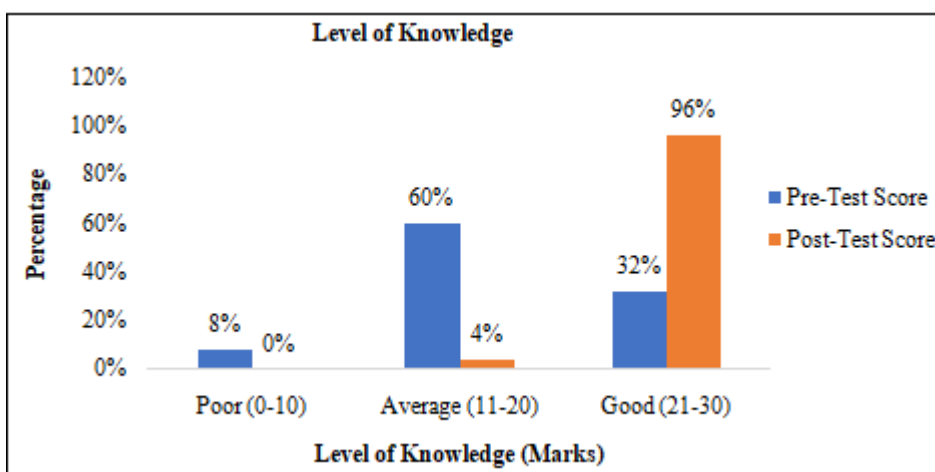
Table 3.2: Comparison of Mean, Standard Deviation and Standard error mean of Pre-Test and Post-Test knowledge scores of B. Sc. Nursing students regarding CPR.

Test Scores	Total No. of Students	Mean	Standard Deviation	Standard Error Mean
Pre-Test Score	50	24.54	2.517	0.356
Post-Test Score	50	18.00	4.734	0.669

Table 3.2 depicts that comparison of Mean, Standard Deviation and Standard Error Mean of Pre-Test and Post-Test knowledge scores shows that in Pre-Test the Mean score is 24.54 whereas in Post-Test the Mean score is 18.00 revealing the difference of 6.54 that shows the effectiveness of STP.

Table 3.3: Comparison between difference of Pre-Test and Post-Test Knowledge of B. Sc. Nursing students regarding CPR

Test Scores	Paired Differences					't' Value	'df' Value	Level of Significance (2-tailed)
	Mean	Standard Deviation	Standard Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pre-Test Score-Post-Test Score	6.540	3.358	0.475	5.586	7.494	13.773	49	.000 (.01) Significant

P =.01, P<0.05 = Significant, P>0.05 = Non-Significant

Table 3.3 depicts that Paired 't' test was calculated to assess the Pre-Test and Post-Test knowledge scores of B. Sc. Nursing students regarding CPR. The findings show highly significant difference of Pre-Test and Post-Test knowledge scores of B. Sc. Nursing students regarding CPR.

Hence, the Null Hypothesis is rejected and Research Hypothesis is accepted (P<.05). It shows that the STP is effective.

Section 4.4: Association between the selected Demographic Variables with the Level of Knowledge among B. Sc. Nursing students.

Table 4.1: Association between the selected demographic variables with the Level of Knowledge of Post-Test among B. Sc. Nursing students

S. No.	Demographic Variables		Poor	Average	Good	Chi Square Value	P Value
1.	Age	17 to 18	0	0	1	0.543 df = 3	P = 0.909 (P>0.05) NS
		18 to 20	0	1	33		
		21 to 22	0	1	13		
		23 to 24	0	0	1		
2.	Sex	Male	0	0	0	Constant Sex	Constant Sex
		Female	0	2	48		
3.	Religion	Hindu		1	13	0.566 df = 3	P = 0.904 (P>0.05) NS
		Sikh		1	32		
		Muslim		0	1		
		Any Other		0	2		
4.	Previous Knowledge about CPR.	Yes		2	48	Constant Knowledge	Constant Knowledge
		No		0	0		
5.	0.896	Media		0	0	0.220 df = 2	P = 0.896 (P>0.05) NS
		Books		1	25		
		Teachers		1	19		
		Health Professionals		0	4		
6.	Place of Stay	Home		0	7	0.339 df = 1	P = 0.560 (P>0.05) NS
		Hostel		2	43		
		PG		0	0		

NS=Non-Significant (P>0.05)

Chi square was calculated to find out the association between the level of knowledge scores and demographic variables of the B. Sc. Nursing students. Non-Significant association was found between the level of knowledge scores of B. Sc. Nursing students regarding CPR with their demographic variables such as age, sex, religion, previous knowledge about CPR, if yes, source of information through, place of stay.

5. Discussion

The discussion includes objective wise discussion of the findings of the study.

The aim of this study is to assess the effectiveness of STP on knowledge regarding CPR among B. Sc. Nursing students in selected nursing colleges of Punjab.

Objective 1: To assess the level of knowledge regarding CPR among B. Sc. nursing students, before and after administration of STP regarding CPR.

Finding 1: The study findings revealed that before administration of STP i. e. in Pre-Test, 8% B. Sc. nursing students had Poor knowledge and 60% B. Sc. nursing students had Average knowledge and 32% B. Sc. nursing students had good knowledge.

After administration of STP i.e. in Post-Test, 0% B. Sc. nursing students had Poor knowledge and 4% B. Sc. nursing students had Average knowledge and 96% B. Sc. Nursing students had Good knowledge.

Discussion 1: Similarly the study was conducted by Meena (2019) to evaluate the effectiveness of STP on knowledge regarding CPR in adult among student nurses in a selected school of nursing, Dehradun, Uttarakhand. The sample size was 70 student nurses. The data indicates that 18.57% had poor knowledge, while majority 82.85% had average knowledge and none of them had good knowledge in Pre-Test. The knowledge score in Post-Test shows majority i. e.100% acquired good knowledge.

Objective 2: To evaluate the effectiveness of STP regarding CPR among B. Sc. nursing students by comparing Pre-Test and Post-Test knowledge scores.

Finding 2: The study findings revealed that comparison of mean, standard deviation and standard error mean of Pre-Test and Post-Test knowledge scores shows that Pre-Test mean score is 24.54 whereas in Post-Test mean score is 18.00 revealing the difference of 6.54 shows the effectiveness of STP.

Discussion 2: Similarly the study conducted by Deepa PD (2011) to evaluate the effectiveness of STP regarding CPR among B. Sc. Nursing 2nd year students in P. G. college of nursing, Gwalior, Madhya Pradesh. The result indicates that Pre-Test score was 43.37% and after the implementation of STP the score was 79.175%. The mean score of Post-Test knowledge was 31.7 i.e. higher than mean score of Pre-Test knowledge was 24.4, revealing the difference of 7.3 shows the effectiveness of STP.

Objective 3: To find out the association between knowledge regarding CPR among B. Sc. nursing students with the selected demographic variables.

Finding 3: The study findings revealed that the association between knowledge regarding CPR among B. Sc. nursing students with the selected demographic variables. It was interpreted that there was Non-Significant association found between knowledge scores of B. Sc. nursing students regarding CPR with the selected demographic variables.

Discussion 3: Similarly the study was conducted by Rekha Koranga, Priya J. P. Narayan, Kanchan Bala (2019) on the effectiveness of the STP regarding CPR among

undergraduate students at selected college of Dehradun, Uttarakhand. Statistical analysis showed that in this study, there was no significant association between all demographic variables and Pre-Test knowledge score at the level of ($p<0.05$).

6. Conclusion

On the basis of the findings of the study it was revealed that there is a effectiveness of the Structured Teaching Programme (STP) on knowledge regarding Cardiopulmonary Resuscitation (CPR) among B. Sc. Nursing students in selected nursing colleges of Punjab.

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