

A STUDY TO ASSESS THE EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING POST COVID-19 CARDIOPULMONARY COMPLICATIONS AND ITS MANAGEMENT AMONG POST COVID PATIENTS IN SELECTED HOSPITAL, KOLLAM

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ABSTRACT

A quasi experimental study was done to assess the effectiveness of structured teaching programme on post COVID-19 cardiopulmonary complications and its management among post COVID patients at selected hospital, Kollam. The objectives of the study were to assess the knowledge regarding post COVID -19 cardiopulmonary complications and its management, determine the effectiveness of structured teaching programme on knowledge regarding post COVID-19 cardiopulmonary complications and its management and find out the association between pretest knowledge regarding post COVID -19 cardiopulmonary complications and its management among post COVID patients and selected demographic variables. Conceptual frame work used was Imogene King's theory of goal attainment. Quantitative research approach was used with nonrandomized control group design. Purposive sampling technique was used to select 100 post COVID patients who met the criteria. Pretest was done on the first day using knowledge questionnaire followed by Structured Teaching Programme to all the 50 sample (experimental group) and posttest on the 7th day. The findings of the study showed that, there was a significant increase in mean posttest knowledge score of sample ($p < 0.05$) regarding post COVID-19 cardiopulmonary complications and its management among post COVID patients at selected hospital Kollam after structured teaching programme. The study concluded that knowledge level of post COVID patients regarding post COVID cardiopulmonary complications and its management was improved after administration of structured teaching programme.

KEYWORDS: Knowledge, Post COVID-19 cardiopulmonary complications, Structured Teaching Programme, Post COVID patients, selected hospital.

INTRODUCTION

Coronavirus disease 2019 (COVID-19) has had devastating consequences on the global population. In terms of directly measured outcomes, by August 2021, COVID-19 has resulted in more than 4.2 million direct deaths worldwide and more than 600,000 direct deaths in the United States alone. Millions of people globally have recovered from the illness, and there has been significant interest into the impacts of a COVID-19 infection on patients after the patient has recovered.^[1]

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the pathogen responsible for the coronavirus disease 2019 (COVID-19) pandemic, which has resulted in global healthcare crises and strained health resources. As the population of patients recovering from COVID-19 grows, it is paramount to establish an understanding of the healthcare issues surrounding them. COVID-19 is

now recognized as a multi-organ disease with a broad spectrum of manifestations.^[2]

Numerous reports from various parts of the world have shown that COVID-19 has a variety of long-term effects on almost all systems including respiratory, cardiovascular, gastrointestinal, neurological, psychiatric and dermatological systems. A considerable part of patients, up to 87.5%, recovering from acute infection continue to suffer from a variety of symptoms including dyspnea, cough, myalgia, fatigue, and headache. The data that people who have mild illness or no symptoms during acute infection also suffer from long-term symptoms exhibit that the disease causes greater damage than appears in infected persons.^[3]

The manifestations of acute cardiovascular injury associated with SARS-CoV-2 infection are diverse, including acute myocardial infarction, myocarditis, stress

cardiomyopathy, pericarditis, arrhythmias, multisystem inflammatory syndrome in both adults (MIS-A) and children (MIS-C), stroke, macro thrombotic disease including arterial and venous thromboembolism, micro thrombotic disease and bleeding diathesis. The pathogenic mechanisms underlying these clinical manifestations are not well understood and are likely to be multifactorial including primary causes such as elevated local (endotheliitis) and systemic (cytokine storm) inflammation, resulting in coagulopathy, myocardial infarction, stroke, MIS-A, MIS-C and arrhythmias, direct viral cytopathic effects possibly resulting in myocarditis, and autoantibodies.^[4]

It is well known that elderly patients presenting with comorbidities or cardiovascular risk factors are more prone to cardiac complications of SARS-CoV-2 infection. There are several possible links between COVID-19 and cardiac dysfunction. These include diffuse coagulopathy causing micro/macro-vascular occlusions and hypoxia, which may unmask underlying coronary artery disease; reduced lung compliance which impairs right and left ventricular function direct cytotoxicity due to infection of myocardial and/or endothelial cells or exposure to the so-called cytokine storm.^[5]

Statement of the problem

A study to assess the effectiveness of structured teaching programme on knowledge regarding post COVID-19 cardiopulmonary complications and its management among post COVID patients in selected hospital, Kollam.

Objectives

- To assess the knowledge regarding post COVID -19 cardiopulmonary complications and its management among post COVID patients in selected hospital, Kollam.
- To determine the effectiveness of structured teaching programme on knowledge regarding post COVID-19 cardiopulmonary complications and its management among post COVID patients in selected hospital, Kollam.
- To find out the association between pretest knowledge regarding post COVID -19 cardiopulmonary complications and its management

among post COVID patients and selected demographic variables.

Operational definitions

Effectiveness

In this study effectiveness refers to the outcome of the structured teaching programme on knowledge regarding post COVID -19 cardiopulmonary complications and its management among post COVID patients.

Structured teaching programme

In this study structured teaching programme refers to systematically organized planned and executed teaching activity with the specific objectives of imparting knowledge regarding post COVID-19 cardiopulmonary complication and management among post COVID patients.

Knowledge

In this study knowledge refers to the information regarding post COVID -19 cardiopulmonary complications and its management reflected by the respondent's score to the items in the knowledge questionnaire.

Post COVID-19 cardiopulmonary complication and its management

In this study Post COVID-19 cardiopulmonary complication and its management refers to the complications that occur after the patients became COVID -ve and the ways to manage the complications.

The post COVID-19 cardiopulmonary complications include

- Dizziness on standing
- Fast-beating or pounding heart (also known as heart palpitations)
- Chest pain
- Difficulty breathing or shortness of breath
- Cough
- Post COVID pneumonia

Post COVID patients

In this study post COVID patients are persons who were identified as COVID -19 positive and then recovered.

RESEARCH METHODOLOGY

Research Approach	Quantitative research
Research design	A quasi experimental, pre-test post-test control group design
Variables	<p>Dependent variable knowledge of post COVID patients regarding post COVID-19 cardiopulmonary complications and its management</p> <p>Independent variable Structured teaching programme regarding post COVID-19 cardiopulmonary complications and its management.</p> <p>Demographic variable Age, gender, education, occupation and monthly income of the sample</p>
Setting of the study	Bishop Benziger Hospital, Kollam

Population	Post COVID patients in Bishop Benziger Hospital, Kollam.
Sample	Post COVID patients in Bishop Benziger Hospital, Kollam.
Sample size	100 Post COVID patients in Bishop Benziger Hospital, Kollam.
Sampling technique	Purposive sampling technique

RESULTS AND DISCUSSION

Section A: Description of sample characteristics

This section deals with the percentage distribution of sample characteristics such as age, gender, educational status, occupation and monthly income.

Graphical representation of demographic variables N=100

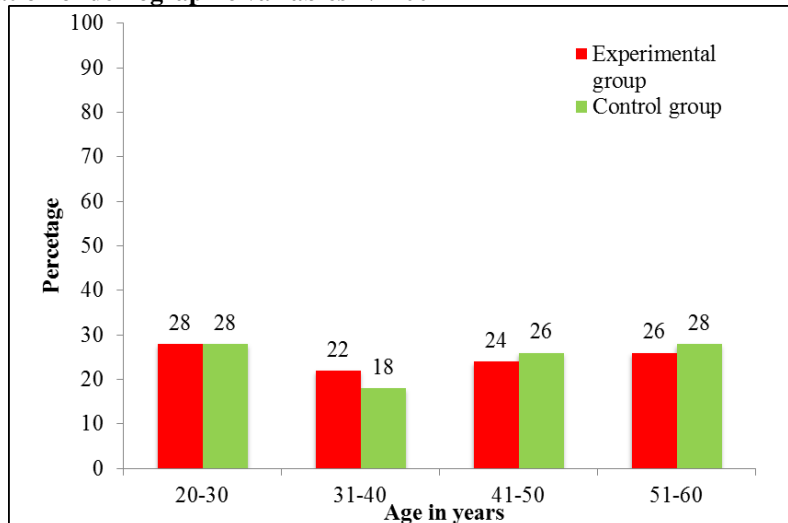


Figure 3: Percentage wise distribution of sample according to age.

The data in the figure 3 shows that in experimental group, 28% of the sample belongs to the age group of 20-30 years, 22% of the sample belongs to the age group of 31-40 years, 24% of the sample belongs to the age group of 41-50 years and 26% of the sample belongs to the age group of 51-60 years category. In control group,

28% of the sample belongs to the age group of 20-30 years, 18% of the sample belongs to the age group of 31-40 years, 26% of the sample belongs to the age group of 41-50 years and 28% of the sample belongs to the age group of 51-60 years category.

N=100

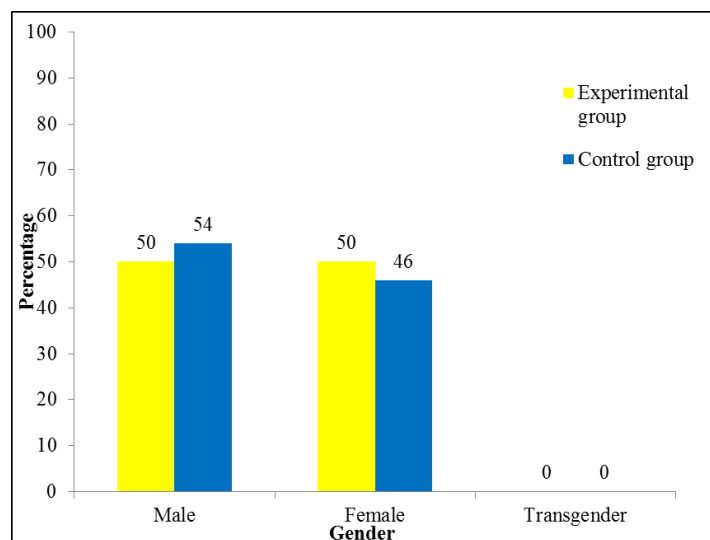


Figure 4: Percentage wise distribution of sample according to gender.

The data in the figure 4 shows that in experimental group, 50% of the sample belongs to male and 50% belongs to female category. In control group, 54% of the

sample belongs to the male category and 46% of the sample belongs to the female category.

N=100

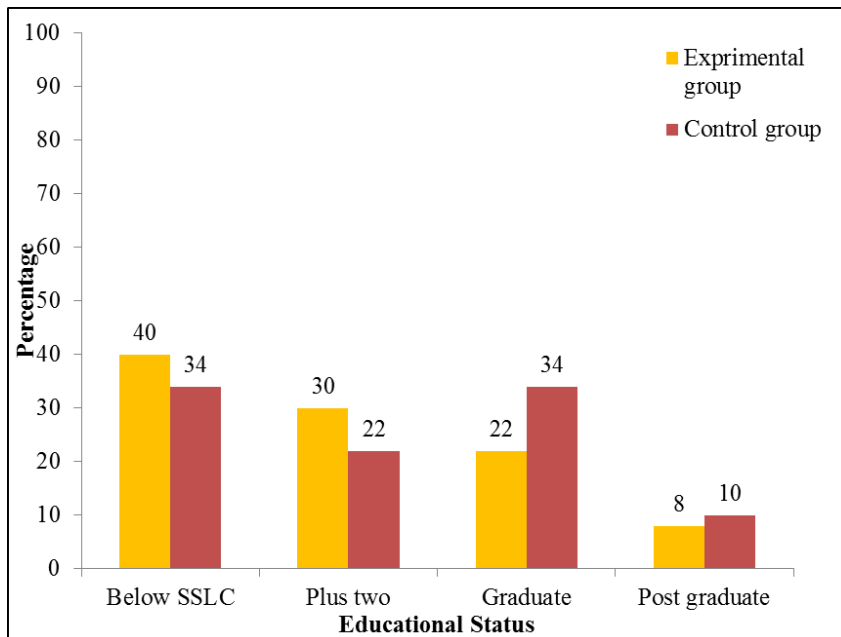


Figure 5: Percentage wise distribution of sample according to educational status.

The data in the figure 5 shows that in experimental group, 40% of the sample had education below SSLC, 30% of the sample had education up to plus two, 22% of the sample were graduates and 8% of the sample were

post graduates. In control group, 34% of each the sample possessed below SSLC and graduate education, 22% of the sample had education up to plus two and 10% were postgraduates.

N=100

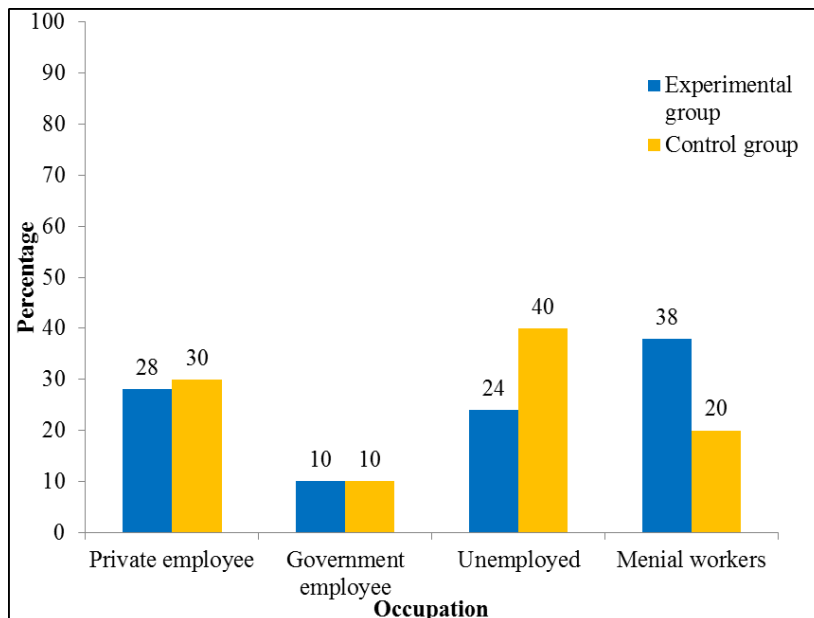


Figure 6: Percentage wise distribution of sample according to occupation.

The data in the figure 6 shows that in experimental group, 28% of the sample were private employee, 10% of the sample were government employee, 24% of the sample were unemployed and 38% of the sample were

menial workers. In control group, 30% of the sample were private employee, 10% of the sample were government employee, 40% of the sample were

unemployed and 20% of the sample were menial workers.

N=100

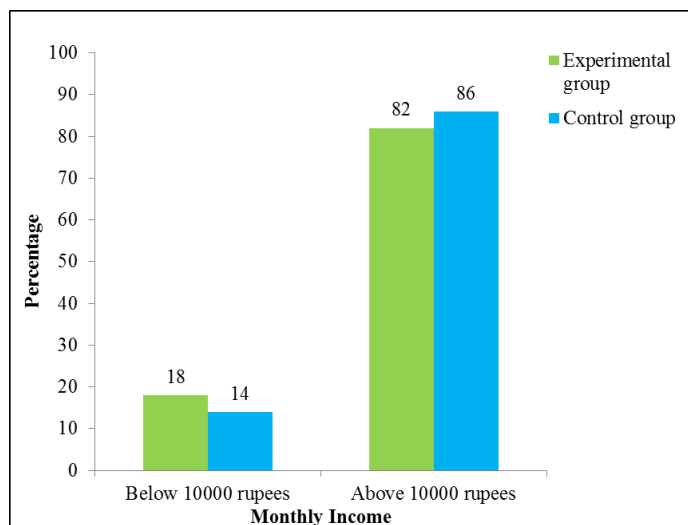


Figure 7: Percentage wise distribution of sample according to monthly income

The data in the figure 7 shows that in experimental group, 18% of the sample had monthly income below 10,000 rupees and 82% of the sample had monthly income above 10,000 rupees. In control group, 14% of the sample had monthly income below 10,000 rupees and 86% of the sample had monthly income above 10,000 rupees.

Section B: Effectiveness of structured teaching programme on knowledge regarding post COVID-19 cardiopulmonary complications and its management among post COVID patients

The knowledge scores were assessed using structured knowledge questionnaire. The section general awareness regarding COVID -19 included 8 questions and the score 2-3 was considered as poor knowledge, 4- 5 average knowledge, 6-7 good knowledge and > 7 excellent

knowledge. 6 questions were included in the section etiology and symptoms of COVID-19 and score 0-1 was considered as poor knowledge, 2- 3 average knowledge, 4- 5 good knowledge, >5 excellent knowledge. Cardiopulmonary complications of COVID-19 section had included 10 questions and score 0-2 was considered as poor knowledge, 3-5 average knowledge, 6-8 good knowledge and >8 excellent knowledge. The section management of post COVID -19 cardiopulmonary complications included 6 questions. Score 0-1 was considered as poor knowledge, 2- 3 was average knowledge, 4-5 was good knowledge and > 5 was excellent knowledge. With regard to the overall score 6- 11 was considered as poor knowledge, score 12-17 was considered as average knowledge, score 18-23 was considered as good knowledge and score 24-29 was considered as excellent knowledge

Table 1: Description of level of knowledge regarding post COVID-19 cardiopulmonary complications and its management among post COVID patients. N=100.

Level of Knowledge	Experimental group		Control group	
	frequency	Percentage	Frequency	percentage
a) General awareness regarding COVID-19				
Poor	2	4%	1	2%
Average	23	46%	23	46%
Good	20	40%	24	48%
Excellent	5	10%	2	4%
b) Etiology and symptoms of COVID -19				
Poor	1	2%	0	0%
Average	23	46%	23	46%
Good	37	74%	39	78%
Excellent	1	2%	4	8%
c) Post COVID-19 cardiopulmonary complications				
Poor	9	18%	5	10%
Average	25	50%	32	64%
Good	13	26%	11	22%

Excellent	3	6%	2	4%
d) Management of post COVID-19 cardiopulmonary complications				
Poor	14	28%	0	0%
Average	27	54%	42	84%
Good	9	18%	8	16%
Excellent	0	0%	0	0%

Data in the table 1 shows that in experimental group, 4% of the sample had poor knowledge, 46% of the sample had average knowledge, 40% of the sample had good knowledge and 10% of the sample had excellent knowledge on general awareness regarding COVID – 19, 2% of the sample had poor knowledge, 22% of the sample had average knowledge, 74% of the sample had good knowledge and 2% of the sample had excellent knowledge on etiology and symptoms of COVID -19, 18% of the sample had poor knowledge, 50% of the sample had average knowledge, 26% of the sample had good knowledge and 6% of the sample had excellent knowledge on post COVID-19 cardiopulmonary complications and 28% of the sample had poor knowledge, 54% of the sample had average knowledge, 18% of the sample had good knowledge and 0% of the sample had excellent knowledge regarding management of post COVID-19 cardiopulmonary complications.

In control group, 2% of the sample had poor knowledge, 46% of the sample had average knowledge, 48% of the sample had good knowledge and 4% of the sample had excellent knowledge on general awareness regarding COVID – 19, 0% of the sample had poor knowledge, 14% of the sample had average knowledge, 78% of the sample had good knowledge and 8% of the sample had excellent knowledge on etiology and symptoms of COVID -19, 10% of the sample had poor knowledge, 64% of the sample had average knowledge, 22% of the sample had good knowledge and 4% of the sample had excellent knowledge on post COVID-19 cardiopulmonary complications and 0% of the sample had poor knowledge, 84% of the sample had average knowledge, 16% of the sample had good knowledge and 0% of the sample had excellent knowledge regarding management of post COVID-19 cardiopulmonary complications.

Table 2: Comparison of mean pre-test knowledge scores of post COVID patients regarding post COVID- 19 cardiopulmonary complications and its management in experimental and control group. N=100.

Group	Mean	SD	't' value	Significance
Experimental group	16.48	4.41	0.74	NS
Control group	17.06	3.32		

Table value t (98) =1.66

NS- non significant

The calculated 't' value is 0.74 which is less than table value (1.66) at 0.05 level of significance, so there is no significant difference in knowledge score between experimental and control group. Hence it can be

concluded that post COVID patients selected in experimental and control group had homogeneity in terms of their pre-test knowledge score.

Table 3: Comparison of mean pre-test and post-test knowledge scores of post COVID patients on general awareness regarding COVID- 19 in experimental group N=50.

Group	Mean	SD	't' value	Significance
Pretest	5.48	1.40	9.46	S
Posttest	7.08	1.00		

Table t value (49) =1.68

S –significant

Calculated 't' value (9.46) is higher than table value (1.68) at 0.05 level of significance, there was significant difference between the pre-test and post test scores of

knowledge on general awareness regarding COVID- 19 in experimental group.

Table 4: Comparison of mean pre-test and post-test knowledge scores of post COVID patients on etiology and symptoms of COVID -19 in experimental group.

N=50

Group	Mean	SD	't' value	Significance
Pretest	3.96	0.92	10.92	S
Posttest	5.18	0.72		

Table t value (49) =1.68

S –significant

Calculated 't' value (10.92) is higher than table value (1.68) at 0.05 level of significance, there was significant

difference between the pre-test and post test scores of knowledge on etiology and symptoms of COVID -19 in experimental group.

Table 5: Comparison of mean pre-test and post-test knowledge scores of post COVID patients on post COVID-19 cardiopulmonary complications in experimental group.

N=50

Group	Mean	SD	't' value	Significance
Pretest	4.86	2.13	10.79	S
Posttest	8.14	1.37		

Table t value (49) =1.68

S –significant

Calculated 't' value (10.79) is higher than table value (1.68) at 0.05 level of significance, there was significant difference between the pre-test and post test scores of

knowledge on post COVID-19 cardiopulmonary complications in experimental group.

Table 6: Comparison of mean pre-test and post-test knowledge scores of post COVID patients on management of post COVID -19 cardiopulmonary complications in experimental group

N=50

Group	Mean	SD	't' value	Significance
Pretest	2.16	1.21	10.25	S
Posttest	4.18	1.34		

Table t value (49) =1.68

S –significant

Calculated 't' value (10.79) is higher than table value (1.68) at 0.05 level of significance, there was significant difference between the pre-test and post test scores of

knowledge on management of post COVID -19 cardiopulmonary complications in experimental group.

Table 7: Comparison of mean pre-test and post-test knowledge scores of post COVID patients on regarding post COVID -19 cardiopulmonary complications and its management in experimental group.

N=50

Group	Mean	SD	't' value	Significance
Pretest	16.48	4.41	19.33	S
Posttest	24.64	2.61		

Table t value (49) =1.68

S –significant

Calculated 't' value (19.33) is higher than table value (1.68) at 0.05 level of significance, there was significant difference between the pre-test and post test scores of knowledge regarding post COVID -19 cardiopulmonary complications and its management in experimental

group. Hence hypothesis H1 which states that there will be significant difference between pre-test and post-test knowledge score on post COVID-19 cardiopulmonary complication and its management among post COVID patients in experimental group was accepted.

Table 8: Description of level of knowledge regarding post COVID-19 cardiopulmonary complications and its management among post COVID patients in experimental and control group in post test.

N=100

Level of Knowledge	Experimental group		Control group	
	frequency	Percentage	Frequency	Percentage
a) General awareness regarding COVID-19				
Poor	0	0%	1	2%
Average	2	4%	26	52%
Good	25	50%	21	42%
Excellent	23	56%	2	4%
b) Etiology and symptoms of COVID -19				
Poor	0	0%	0	0%
Average	0	0%	6	12%
Good	33	66%	40	80%
Excellent	17	34%	4	8%
c) Post COVID-19 cardiopulmonary complications				
Poor	9	18%	5	10%

Level of Knowledge	Experimental group		Control group	
	frequency	Percentage	Frequency	Percentage
Average	25	50%	32	64%
Good	13	26%	11	22%
Excellent	3	6%	2	4%
d) Management of post COVID-19 cardiopulmonary complications				
Poor	14	28%	0	0%
Average	27	54%	42	84%
Good	9	18%	8	16%
Excellent	0	0%	0	0%

Data in the table 8 shows that in experimental group, 4% of the sample had average knowledge, 50% of the sample had good knowledge and 56% of the sample had excellent knowledge on general awareness regarding COVID – 19, 66% of the sample had good knowledge and 34% of the sample had excellent knowledge on etiology and symptoms of COVID -19, 6% of the sample had average knowledge, 50% of the sample had good knowledge and 54% of the sample had excellent knowledge on post COVID-19 cardiopulmonary complications and 2% of the sample had poor knowledge, 30% of the sample had average knowledge, 56% of the sample had good knowledge and 10% of the sample had excellent knowledge regarding management of post COVID-19 cardiopulmonary complications.

In control group, 2% of the sample had poor knowledge, 52% of the sample had average knowledge, 42% of the sample had good knowledge and 4% of the sample had excellent knowledge on general awareness regarding COVID – 19, 0% of the sample had poor knowledge, 12% of the sample had average knowledge, 80% of the sample had good knowledge and 8% of the sample had excellent knowledge on etiology and symptoms of COVID -19, 8% of the sample had poor knowledge, 62% of the sample had average knowledge, 26% of the sample had good knowledge and 4% of the sample had excellent knowledge on post COVID-19 cardiopulmonary complications and 80% of the sample had average knowledge, 20% of the sample had good knowledge and 0% of the sample had excellent knowledge regarding management of post COVID-19 cardiopulmonary complications.

Table 9: Comparison of mean post test knowledge scores of post COVID patients on general awareness regarding COVID- 19 in experimental and control group.

N=100

Group	Mean	SD	't' Value	Significance
Experimental group	7.08	1.01	8.52	S
Control group	5.32	1.06		

Table value t (98) =1.66

S- significant

Calculated 't' value (8.52) is higher than table value (1.66) at 0.05 level of significance, there was significant difference between the post test scores of knowledge on

general awareness regarding COVID- 19 among experimental and control group

Table 10: Comparison of mean post test knowledge scores of post COVID patients on etiology and symptoms of COVID- 19 in experimental and control group.

N=100

Group	Mean	SD	't' Value	Significance
Experimental group	5.16	0.71	5.22	S
Control group	4.32	0.89		

Table value t (98) =1.66

S- significant

Calculated 't' value (5.22) is higher than table value (1.66) at 0.05 level of significance, there was significant difference between the post test scores of post COVID patients on etiology and symptoms of COVID- 19 in experimental and control group.

Table 11: Comparison of mean post test knowledge scores of post COVID patients on post COVID- 19 cardiopulmonary complications in experimental and control group.

N=100

Group	Mean	SD	't' Value	Significance
Experimental group	8.14	1.37	10.68	S
Control group	4.76	1.76		

Table value t (98) =1.66

S- significant

Calculated 't' value (10.68) is higher than table value (1.66) at 0.05 level of significance, there was significant difference between the post test scores of post COVID

patients on post COVID- 19 cardiopulmonary complications in experimental and control group.

Table 12: Comparison of mean post test knowledge scores of post COVID patients on management of post COVID- 19 cardiopulmonary complications in experimental and control group.

N=100

Group	Mean	SD	't' Value	Significance
Experimental group	4.18	1.35	5.72	S
Control group	2.88	0.87		

Table value t (98) =1.66

S- significant

Calculated 't' value (5.72) is higher than table value (1.66) at 0.05 level of significance, there was significant difference between the post test scores of post COVID

patients on management of post COVID- 19 cardiopulmonary complications in experimental and control group.

Table 13: Comparison of mean post test knowledge scores of post COVID patients on post COVID- 19 cardiopulmonary complications and its management in experimental and control group.

N=100

Group	Mean	SD	't' Value	Significance
Experimental group	24.64	2.61	11.66	S
Control group	17.40	3.19		

Table value t (98) =1.66

S- significant

Calculated 't' value (11.66) is higher than table value (1.66) at 0.05 level of significance, there was significant difference between the post test scores of knowledge regarding post COVID-19 cardiopulmonary complications and its management among experimental and control group. Hence hypothesis H2 which states

that there will be significant difference between post-test knowledge score on post COVID-19 cardiopulmonary complication and its management among post COVID patient in control group and experimental group was accepted.

Section C: Association between pre test knowledge score regarding post COVID-19 cardiopulmonary complications and its management among post COVID patients and selected demographic variables.

Table 14: Association between knowledge regarding post COVID-19 cardiopulmonary complications and its management among post COVID patients and demographic variables.

N=100

Sl No.	Demographic variables	Knowledge score				Df	x ²	Table value	Level of significance
		Poor	Average	good	excellent				
1.	Age in years								
A	20-30	5	14	7	2	9	10.02	16.91	NS
B	31-40	0	8	12	0				
C	41-50	2	10	12	1				
D	51-60	2	11	12	0				
2.	Gender								
A	Male	4	25	21	2	3	1.31	7.82	NS
B	female	5	18	22	3				
3.	Educational status								
A	Below SSLC	8	21	8	0	9	60.45	16.92	S
B	Plus two	1	15	10	0				
C	Degree	0	7	20	1				
D	Postgraduate	0	0	5	4				

Sl No.	Demographic variables	Knowledge score				Df	χ^2	Table value	Level of significance
		Poor	Average	good	excellent				
4.	Occupation								
A	Private Employee	0	12	15	2	9	30.02	21.67	S
B	Govt. Employee	0	0	7	3				
C	Unemployed	5	16	11	0				
D	Menial workers	4	15	10	0				
5.	Monthly income								
A	Below 10000	4	7	5	0	3	6.98	7.82	NS
B	Above 10000	5	36	38	5				

S=significant

NS= Non significant

- Regarding the demographic variable age, the calculated chi square value (10.02) is less than the table value (16.91). Hence there is no significant association between knowledge and the demographic variable 'age'.
- Regarding gender, the calculated chi square value (1.31) is less than the table value (7.82). Hence there is no significant association between knowledge and the demographic variable 'gender'.
- Regarding educational status, the calculated chi square value (60.48) is higher than the table value (16.92). Hence there is significant association between knowledge and the demographic variable 'educational statuses'.
- Regarding occupation, the calculated chi square value (30.02) is higher than the table value (21.67). Hence there is significant association between knowledge and the demographic variable 'occupation'.
- Regarding monthly income, the calculated chi square value (6.98) is less than the table value (7.82). Hence there is no significant association between knowledge and the demographic variable 'monthly income'.

The data in the table 14 shows the association between pretest score of knowledge regarding post COVID-19 cardiopulmonary complications and its management and selected demographic variables such as age, gender, education, occupation and monthly income. All the calculated values were less than table values except for educational status and occupation. So there was significant association between knowledge regarding post COVID-19 cardiopulmonary complications and its management and the variables educational status and occupation. No association was found between knowledge and demographic variables such as age, gender and monthly income. Hence the hypothesis H_3 which states that there will be significant association between knowledge regarding post COVID-19 cardiopulmonary complications and its management and selected demographic variables was partially accepted.

DISCUSSION

This study was conducted to assess the effectiveness of structured teaching programme on knowledge regarding post COVID -19 cardio pulmonary complications and its

management among post COVID patients in a selected hospital, Kollam. The findings of the study were discussed with reference to the objectives, hypotheses and findings of the other studies.

The findings are discussed based on the objectives

The objectives of the study were

- To assess the knowledge regarding post COVID -19 cardiopulmonary complications and its management among post COVID patients in selected hospital, Kollam.
- To determine the effectiveness of structured teaching programme on knowledge regarding post COVID-19 cardiopulmonary complications and its management among post COVID patients in selected hospital, Kollam.
- To find out the association between pretest knowledge regarding post COVID -19 cardiopulmonary complications and its management among post COVID patients and selected demographic variables.

To assess the knowledge regarding post COVID -19 cardiopulmonary complications and its management among post COVID patients in selected hospital, Kollam

The findings of the present study showed that only 14% of the sample had poor knowledge, 36% of the sample had average knowledge, 46% of the sample had good knowledge and 4% of the sample had excellent knowledge regarding post COVID -19 cardiopulmonary complications and its management. It reflects the need to have more training.

The present study is consistent with another study which was conducted to gather data on the knowledge and attitude on long-term complications of COVID 19 in Sree Lanka. Descriptive cross sectional study design was used. The sample size was 201 sample. The results showed that 89.2% participants have heard about long-term complications of COVID 19. Only 35.9% possessed adequate knowledge relating to co-morbidities and risk factors of COVID-19. A total of 92.2% believe that they should adhere to preventive measures following vaccination. Less than 60 % followed the advice thus avoiding unnecessary travel and crowded places. Further, less than 50% were following COVID preventive measures. Although majority of participants have heard

about long-term complications and common symptoms, the knowledge regarding co-morbidities that can lead to severe disease and long COVID was not satisfactory. These findings highlight the need for organizing more awareness programmes related to post COVID -19 cardiopulmonary complications.^[4]

Both studies adopted quantitative research approach. In present study quasi experimental, non-randomized control group design was used and in reference study descriptive cross sectional study design was used. In both studies post COVID patients were the sample. The sample size of present study was 100 and size of reference study was 201. In both studies the sample were collected using purposive sampling technique. The tool used for knowledge assessment in both studies were structured knowledge questionnaire. The present study along with the supportive study shows that the patient's knowledge regarding post COVID -19 complications was poor.

To determine the effectiveness of structured teaching programme on knowledge regarding post COVID-19 cardiopulmonary complications and its management among post COVID patients in selected hospital, Kollam

There was significant difference between pretest and posttest knowledge of post COVID patients regarding post COVID -19 cardiopulmonary complications and its management. The present study findings revealed that the structured teaching programme was effective in improving the knowledge of post COVID patients regarding post COVID -19 cardiopulmonary complications.

The above finding is supported by another study conducted to determine the effect of community-based health education on knowledge and attitudes of post COVID-19 complications. Quantitative research approach and quasi-experimental research design was used. The sampling technique used was simple random sampling, the samples were 62 people divided into two groups. The intervention group received the intervention of community-based health education and control group received a Covid-19 related leaflet. The research showed that respondents in the intervention group have better knowledge and better attitudes. The community-based health education method has proved as an effective means to promote and prevent post COVID-19 complication.^[20]

Both studies adopted quantitative approach. Post COVID patients were the sample in both studies. Sample size was 100 in present study and 62 in referent study. In the present study, sample was collected using purposive sampling technique and in referent study, simple random sampling was used. Present study was hospital based study and referent study was community based study. The present study included, structured teaching programme while in the referent study it was community

based health education. Both study results showed that, structured teaching programme and community based health education were very effective in increasing the knowledge of post COVID patients regarding post COVID -19 cardiopulmonary complications and its management.

To find out the association between pretest knowledge regarding post COVID -19 cardiopulmonary complications and its management among post COVID patients and selected demographic variables

All the calculated chi-square values were less than table value except for educational status and occupation. So there was significant association between knowledge regarding post COVID-19 cardiopulmonary complications and its management and the selected demographic variables such as educational status and occupation. No association was found between knowledge and selected demographic variables such as age, gender and monthly income.

A similar study was conducted to assess the knowledge regarding post COVID complications among adults in the state of Maharashtra. Quantitative research approach and non experimental descriptive survey design was used in this study. Non-probability convenient sampling technique was used to collect 100 sample. The findings of the supported study showed that, the tabulated 'F' values was 3.05(df=2, 97) which is much less than the calculated 'F' i.e. 4.85 at 5% level of significance. Also, the calculated 'p'=0.010 which was much less than the acceptable level of significance i.e. 'p'=0.05. Hence it is interpreted that age of adults is statistically associated with their knowledge score. The tabulated 'F' values was 3.07(df=2, 97) which is less than the calculated 'F' i.e. 2.95 at 5% level of significance. Also the calculated 'p'=0.024 which was much less than the acceptable level of significance i.e. 'p'=0.05. Hence it is interpreted that occupation of adults is statistically associated with their knowledge score.^[45]

On comparison of two studies, it was revealed that both studies have quantitative research approach. In present study quasi experimental, non-randomized control group design was used and in reference study, descriptive cross sectional study design was used. In both studies, post COVID patients were the sample. The sample size of present study was also 100 and size of reference study was 100. In the present study, sample was collected using purposive sampling technique and in the supporting study sample was collected using convenient sampling technique. The tool used for both studies were structured knowledge questionnaire. The present study showed that there was significant association between knowledge regarding post COVID-19 cardiopulmonary complications and its management and the selected demographic variables educational status and occupation. No association was found between knowledge and demographic variables such as age, gender and monthly income. The supporting study

showed that there was significant association between knowledge and their Age and Occupation. There was no significant association between knowledge score and the demographic variables Gender and education.

Summary

This study was done to assess the effectiveness of structured teaching programme on post COVID-19 cardiopulmonary complications and its management among post COVID patients at selected hospital, Kollam. The objectives of the study were to assess the knowledge regarding post COVID -19 cardiopulmonary complications and its management, determine the effectiveness of structured teaching programme on knowledge regarding post COVID-19 cardiopulmonary complications and its management and find out the association between pretest knowledge regarding post COVID -19 cardiopulmonary complications and its management among post COVID patients and selected demographic variables.

The conceptual frame work used was Imogene King's theory of goal attainment. Quantitative research approach was used with nonrandomized control group design. Purposive sampling technique was used to select 100 post COVID patients who met the criteria.

Pilot study was conducted with 10 sample to confirm the feasibility and practicability of the study. The main study was done on 100 sample, pretest was conducted for the total sample using knowledge questionnaire followed by structured teaching programme and posttest on the 7th day of intervention. The effectiveness of structured teaching programme on knowledge regarding post COVID -19 cardiopulmonary complications and its management among post COVID patients was assessed by structured knowledge questionnaire.

CONCLUSION

The present study was aimed to find the effectiveness of structured teaching programme on knowledge regarding post COVID -19 cardiopulmonary complications among post COVID patients. The result of the study showed that, the pretest knowledge score of sample was 16.48 and posttest knowledge score was 24.64 and 't' value (19.33) was greater than the table value (1.68) at 0.05 level of significance. So there was significant difference between mean pretest and posttest knowledge score regarding post COVID -19 cardiopulmonary complications and its management among post COVID patients in experimental group. So structured teaching programme was effective on post COVID -19 cardiopulmonary complications and its management.

Mean post test knowledge score of sample in experimental group was 26.64 and control group was 17.4. Calculated 't' value (11.66) is greater than table 't' value 1.66 at 0.05 level of significance, there was significant difference between posttest knowledge score regarding post COVID -19 cardiopulmonary

complications and its management among post COVID patients in experimental and control group. So structured teaching programme was effective on post COVID -19 cardiopulmonary complications and its management.

All the calculated chi square values were less than table value except for educational status and occupation. So there was significant association between knowledge regarding post COVID-19 cardiopulmonary complications and its management and the selected demographic variables like educational status and occupation. No association was found between knowledge and selected demographic variables such as age, gender and monthly income.

Nursing implications

The present study has various implications in the field of nursing practice, nursing research and nursing administration.

Implications for nursing practice

Educating and creating awareness is an integral part of the nursing service Based on nurses can educate the patients regarding knowledge regarding post COVID -19 cardiopulmonary complications and its management.

Implications for nursing education

- The nurse educators can organize programme for students regarding the post COVID -19 cardiopulmonary complications and its management.
- The nurse educators should encourage the staff nurses and student nurses to conduct health education programme regarding post COVID -19 cardiopulmonary complications and its management.
- Nurse educator can encourage the nursing students for the effective utilization of evidence based practice.

Implications for nursing administration

- The nurse administrator can take the initiative in imparting information relatd to post COVID -19 cardiopulmonary complications and its management.
- Nurse administrators should be aware of the teaching programme and can suggest their subordinates to practice these teaching programmes which will help the post COVID patients to identify and manage post COVID-19 cardiopulmonary complications.

Implications for nursing research

- Nurse researcher can undertake similar studies among post COVID patients regarding other post COVID complications on different settings in the community as well as in the hospitals.
- Nurse researcher can conduct interventional studies to assess the effect of video assisted teaching / self-instructional module among post COVID patients regarding post COVID -19 cardiopulmonary complications.

- Documentation of research findings through presentation and publications will add to the body of knowledge and help in nursing practice.

Limitations

Due to the spread of COVID-19 pandemic data collection period was extended to two more weeks.

Recommendations

Based on the research findings the following recommendations can be implemented.

- The same study can be replicated on large sample and also at different settings. A higher sample would help to create a higher statistical power that would increase the chance of finding statistical significance to generalize.
- A descriptive study can be done to assess the knowledge of post COVID patients regarding post COVID-19 cardiopulmonary complications and its management.
- The same study can be conducted by using true experimental research design

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