A Quasi-experimental Study to Assess the Knowledge Regarding Planned Pre-operative Teaching on Post-operative Self-care Activities among Patients Undergoing Cardiac Surgery in Selected Hospital of a City

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Abstract

Aim: The aim of this research is to assess the knowledge regarding planned pre-operative teaching on post-operative self-care activities among patients undergoing cardiac surgery in selected hospital of the city using quasi-experimental investigation.

Materials and Methods: The research design quasi-experimental research design with a control group approach was used. The sample size for the study is 400 samples. The tool used for the study was a self-administered knowledge questionnaire and an observation practice checklist.

Result: Research showed that 80 (40%) of experimental group respondents had weak knowledge, and 15 (7.5%) had excellent knowledge. In control group, 89 (44.5%) had inadequate pre-operative self-care knowledge, whereas 12 (6%) had great knowledge. In addition, 81 (40.5%) respondents had strong knowledge and 4 (2%) had bad knowledge. In the control group, 77 (38.5%) had inadequate post-operative self-care knowledge and 15 (7.5%) had outstanding knowledge. The chi-square value of demographic variables such as age in year, gender, marital status, residence, religion, occupation, and monthly family income in rupees is there any bad habits, and age in years and religion showed significant associations with pre-test knowledge score at 0.05 level of significance, indicating that practice score is associated with selected demographic variables.

Conclusion: The findings support that the planned pre-operative teaching is effective in the knowledge regarding self-care activity among patients undergoing cardiac surgery. The knowledge of cardiac surgery patients is improved.

Keywords: Cardiac surgery, patients, post-operative self-care, pre-operative teaching, quasi-experimental study

INTRODUCTION

Any surgical procedure carried out on the blood arteries that bring and take away blood from the heart is called cardiovascular surgery, sometimes known as heart or cardiac surgery.[1] A listing of the most frequent cardiac surgical procedures includes coronary artery bypass grafting (CABG), the replacement or repair of heart valves, the implantation of a pacemaker or implantable cardioverter-defibrillator, the repair of an aneurysm, maze surgery, heart transplantation, and the placement of a ventricular assist device or total artificial heart.[2] However, more than 25% of all patients undergoing CABG and/or VR require hospital readmission during the first 3 months of recovery due to post-operative complications. Patients' poor self-care may cause post-operative healing issues.[3] It reportedly helps patients cope with discomfort, educates them on health issues, and provides psychological support.[4]

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Pre-operative instruction is a crucial part of the client's surgical experiences. The nurse's primary duty is to educate patients about post-operative care procedures during the pre-operative stage. Pre-operative education helps patients feel less anxious and motivates people to actively take part in their care.[5]

Although patient education programs have been put in place, prior research and expert opinions indicate that despite this, patients frequently fail to effectively engage in their care and treatment as well as the essential recovery-related behaviors.

According to the Oxford Dictionary- The act of acting is to maintain or enhance one's own health following a surgical procedure. It refers to activities and practices that can help patients undergone cardiac surgery to reduce their complications post-operatively and overall well-being.

In this study- Education or training on self-care tasks for post-operative patients is the process of acquiring and expanding one's expertise. It includes (deep breathing exercises, leg and foot exercises, splinting and coughing, getting into and out of a chair, spirometer, washing hands, personal cleanliness, healthy nutrition, decreasing stress, and building regular sleep patterns).

The current study's objective is to create and assess the impact of pre-operative instruction on post-operative self-care activities in specific settings.

Objective
The objectives of the study are as follows:
1. To assess the pre-test knowledge score on post-operative self-care activities among patients undergoing cardiac surgery before intervention in both groups.
2. To assess the post-test knowledge score on post-operative self-care activities among patients undergoing cardiac surgery after intervention in both groups.
3. To determine the effectiveness of planned pre-operative teaching regarding post-operative self-care activities among patients undergoing cardiac surgery.
4. To determine the association between the pre-test knowledge score with selected demographic variables.

Materials and Methods

Research approach
Quantitative research methodology analyzed cardiac surgery patients' knowledge. Effectiveness is measured by comparing experimental and control patient scores.

Research design
The research design adopted by a researcher is the quasi-experimental research design with a control group approach.

Setting of study
The proposed a study will be carried out at selected hospitals in the city of Uttar Pradesh.

Population of study
All patients undergoing cardiac surgery are included.

Sample size
Approximately, the sample size for the study is 400 samples.

Sample technique
The study's sample was chosen using a non-probability purposive sampling technique.

Sampling criteria
The sample selection was based on the following inclusion and exclusion criteria:

Inclusion criteria
1. Patients who are undergoing cardiac surgery in selected hospitals.
2. Patients who are willing to participate in the study.
3. Patients who are between the age group 18–60 years.
4. Patients who are able to understand Marathi or English or Hindi.

Exclusion criteria
1. Patients who are unconscious.

Statistics
Descriptive statistics
Frequency and percentage distribution are used to analyze the demographic data.

Inferential statistics
Chi-square test was used to assess the association of knowledge and percentage with their demographic variables.

Results

Section A: Frequency and percentage distribution of the demographic variables in experimental group and control group
Table 1 shows that 70 (35%) were 51 and older, 140 (70%) were male, 125 (62.5%) were married, 115 (57.5%) were from urban areas, 115 (57.5%) were Hindu, 100 (50%) were graduates, 90 (45%) were business owners, 95 (47.5%) had 20,001 and above family income. 140 (73%) had mix type of diet.

Section B: Assessment of pre and post-test knowledge score of the experimental group and control group
The experimental group had 80 (40%) [Table 2] poor and 15 (7.5%) excellent knowledge of post-operative self-care, while the control group had 89 (44.5%) bad and 12 (6%) great knowledge.

Table 3 displays the mean ± SD knowledge score of 11.20 ± 8.46 for the experimental group. In the control group, the mean ± SD knowledge score was 10.33 ± 9.

The data in Table 4 depict that in experimental group, 81 (40.5%) had good knowledge and 4 (2%) had poor knowledge. Whereas in control group, 77 (38.5%) had poor knowledge and 15 (7.5%) had excellent knowledge.

The data in Table 5 show that the experimental group was mean ± SD of knowledge (21.66 ± 6.33), whereas the control group was mean ± SD of knowledge (11.30 ± 8.12).

Table 1: Distribution of respondents in relation to selected demographic (N=400 [200+200])

S. No.	Demographic variables	Experimental group		Control group	
		Frequency	Percentage	Frequency	Percentage
1.	Age in years				
	a. 18–30 years	15	7.5	5	2.5
	b. 31–40 years	50	25	55	27.5
	c. 41–50 years	65	32.5	65	32.5
	d. 51 and above	70	35	75	37.5
2.	Gender				
	a. Male	140	70	115	57.5
	b. Female	60	30	85	42.5
3.	Marital status				
	a. Unmarried	55	27.5	55	27.5
	b. Married	125	62.5	120	60
	c. Widow	20	10	25	12.5
	d. Divorce	00	00	00	00
4.	Residence				
	a. Rural	85	42.5	60	30
	b. Urban	115	57.5	140	70
5.	Religion				
	a. Hindu	115	57.5	105	52.5
	b. Muslim	60	30	45	22.5
	c. Christian	10	5	40	20
	d. Other	15	7.5	10	5
6.	Education				
	a. Illiterate	25	12.5	30	15
	b. Primary	30	15	25	12.5
	c. Secondary	45	22.5	60	30
	d. Graduate and above	100	50	85	42.5
7.	Occupation				
	a. Govt. employed	15	7.5	10	5
	b. Private employed	70	35	90	45
	c. Business	90	45	65	32.5
	d. Housewife	15	7.5	20	10
	e. Unemployed	10	5	15	7.5
8.	Monthly family income in rupees				
	a. 5,000–10,000	20	10	15	7.5
	b. 10,001–15,000	25	12.5	30	15
	c. 15,001–20,000	60	30	90	45
	d. 20,001 and above	95	47.5	65	32.5
9.	Presence of known case of cardiac surgery in family				
	a. Yes	65	32.5	78	39
	b. No	135	67.5	122	61
10.	Is there any bad habits				
	a. Smoking	65	32.5	55	27.5
	b. Drinking alcohol	45	22.5	95	47.5
	c. Tobacco or ghutka chewing	90	45	50	25
11.	Type of planned surgery				
	a. CABG	140	70	135	67.5
	b. ASD	00	00	00	00
	c. VSD	00	00	00	00
	d. DVR	30	15	40	20
	e. MVR	30	15	25	12.5
	f. AVR	00	00	00	00
12.	Type of diet				
	a. Vegetarian	54	27	59	29.5
	b. Mixed type of diet	146	73	141	70.5

CABG: Coronary artery bypass grafting, ASD: Atrial septal defect, VSD: Ventricular septal defect, DVR: Double valve replacement, MVR: Mitral valve replacement, AVR: Aortic valve replacement

Table 2: Distribution of respondents according to the pre-test knowledge

Pre-test knowledge score	Experimental group		Control group	
	Frequency	Percentage	Frequency	Percentage
Excellent (29–34)	15	7.5	12	6
Very Good (16–28)	20	10	18	9
Good (15–21)	21	10.5	21	10.5
Average (8–14)	64	32	60	30
Poor (0–7)	80	40	89	44.5

Table 3: Mean, median, and standard deviation of the pre-test knowledge level score of experimental group and control group patients regarding post-operative self-care activities

Group	Mean	Median	SD
Experimental group	11.20	10	8.46
Control group	10.33	8.06	9

Table 4: Distribution of respondents according to the post-test knowledge score among experimental group and control group

Post-test knowledge score	Experimental group		Control group	
	Frequency	Percentage	Frequency	Percentage
Excellent (29–34)	45	22.5	15	7.5
Very Good (16–28)	60	30	20	10
Good (15–21)	81	40.5	21	10.5
Average (8–14)	10	5	67	33.5
Poor (0–7)	04	2	77	38.5

Section C: Assessment of effectiveness of planned teaching program regarding post-operative self-care activities among patients undergoing cardiac surgery in experimental group and control group

Table 6 depicts pre-test mean 11.2 and SD 8.46, whereas post-test shows mean 21.66 and SD was 6.33, respectively. The 't' test value was 13.98 with df 199 and $P < 0.00001$. The results show significant effectiveness ($P < 0.05$).

Table 7 depicts pre-test mean 10.33 and SD 8.06, whereas post-test shows that mean was 11.30 and SD was 8.12, respectively. The 't'-test value was 1.19 with df 199 and P-value was 0.1156. The results show non-significant effectiveness (p<0.05).

Section D: Determine the association between the knowledge level of cardiac surgery patients with the demographic variables in the experimental group and control group

Table 8 shows the Chi-square value of demographic variables such as age, gender, marital status, residence, religion, and occupation. Monthly income in rupees is that there any bad habits showed a 0.05 association between practice score and demographic variables. The null hypothesis was rejected and the alternative hypothesis was accepted.

Table 9 uses Chi-square values of demographic data such as age in year and religion, and practice score was associated with selected demographic variables at 0.05. The null hypothesis was rejected and the alternative hypothesis was accepted.

Table 5: Mean, median, and standard deviation of the post-test knowledge level score of experimental group and control group patients regarding post-operative self-care activities

Group	Mean	Median	SD
Experimental group	21.66	20	6.33
Control group	11.30	10	8.12

Table 6: Effectiveness of planned pre-operative teaching on knowledge regarding post-operative self-care activities in experimental group (N=200)

Test	Mean	SD	T-test	DF	P-value	Result
Pre-test	11.20	8.46	13.98	199	<0.00001	S Significant
Post-test	21.66	6.33				

Table 7: Effectiveness of planned pre-operative teaching on knowledge regarding post-operative self-care activities in control group (N=200)

Test	Mean	SD	T-test	DF	P-value	Result
Pre-test	10.33	8.06	1.19	199	0.1156	NS
Post-test	11.30	8.12			P<0.05	Non-Significant

Discussion

Similar study conducted by Gaidhani and Chaugule says that the experimental group recovered moderately (30%) and well (70%), while the control group recovered moderately (85%) and poorly (5%). Significant differences in post-operative outcome scores between experimental and control

Table 8: Association between the knowledge level regarding post-operative self-care activities among the cardiac surgery patients in the experimental group with selected demographic variables (N=200)

Socio-demographic Variables	Total no of samples	Level of knowledge score					Df	P value	χ^2 value	Result
		Excellent	Very Good	Good	Average	Poor				
1. Age in years							12	0.010	26.05	S
18–30 years	15	3	5	1	4	2				Significant
31–40 years	50	3	7	5	22	13				
41–50 years	65	3	4	7	19	32				
51 years	70	6	4	8	19	33				
2. Gender							4	0.0006	19.37	S
Male	140	12	19	12	52	45				Significant
Female	60	3	1	9	12	35				
3. Marital status							8	0.0052	21.84	S
Unmarried	55	3	7	2	11	32				Significant
Married	125	10	12	14	50	39				
Widow	20	2	1	5	3	9				
Divorce	00	0	0	0	0	0				
4. Residence							4	0.0001	23.19	S
Rural	85	2	4	6	24	49				Significant
Urban	115	13	16	15	40	31				
5. Religion							12	0.000	51.61	S
Hindu	115	8	9	7	36	55				Significant
Muslim	60	4	5	3	26	22				
Christian	10	1	2	4	1	2				
Other	15	2	4	7	1	1				
6. Education							12	0.1143	18.047	NS
Illiterate	25	2	5	4	4	10				Non-Significant
Primary	30	3	5	5	7	10				
Secondary	45	5	5	6	14	15				
Graduate and above	100	5	5	6	39	45				
7. Occupation							16	0.00015	44.64	S
Govt. Employed	15	1	3	4	2	5				Significant
Pvt. Employed	70	3	7	6	27	27				
Business	90	5	5	5	31	44				
Housewife	15	4	1	4	3	3				
Unemployed	10	2	4	2	1	1				
8. Monthly family income in rupees							12	0.01123	25.86	S
5,000–10,000 Rs	20	2	5	3	3	7				Significant
10,001–15,000 Rs.	25	3	2	7	7	6				
15,001–20,000 Rs	60	7	6	6	19	22				
20,001 and above	95	3	7	5	35	45				
9. Presence of Known case of Cardiac Surgery in family							4	0.5828	2.85	NS
Yes	65	6	9	8	19	23				Non-Significant
No	135	9	11	13	45	57				
10. Is there any bad habits							8	0.00004	33.80	S
Smoking	65	3	5	6	35	16				Significant
Drinking alcohol	45	6	9	7	8	15				
Tobacco or Ghutka Chewing	90	6	6	8	21	49				
11. Type of planned surgery							8	0.1889	11.23	NS
CABG	140	8	12	12	48	60				Non-Significant
ASD	00	0	0	0	0	0				
VSD	00	0	0	0	0	00				
DVR	30	5	4	3	6	12				
MVR	30	2	4	6	10	8				
AVR	00	0	0	0	0	0				
12. Type of diet							4	0.180	6.26	NS
Vegetarian	54	4	6	9	11	24				Non-Significant
Mixed type of diet	146	11	14	12	53	56				

CABG: Coronary artery bypass grafting, ASD: Atrial septal defect, VSD: Ventricular septal defect, DVR: Double valve replacement, MVR: Mitral valve replacement, AVR: Aortic valve replacement

groups ($P < 0.05$) are observed. Pre-operative care bundles significantly reduce CABG risk and extend patient life.[6]

Alkuwaisi *et al.* using Orem's definition of self-care, the two most popular self-care practices entail taking prescription medications as prescribed. Avoiding strain, examining incisions for infection, and phoning a doctor if infection signs appeared were the other three self-care practices. BCFs showed a statistically significant difference in patients' self-care. Single patients reported less self-care than married patients. Only valve replacement (VR)

Table 9: Association between the knowledge level regarding post-operative self-care activities among the cardiac surgery patients in the control group with selected demographic variables (N=200)

Sociodemographic Variables	Total no of samples	Level of knowledge score					Df	P value	χ² value	Result
		Excellent (12)	V. Good (18)	Good (21)	Average (60)	Poor (89)				
1. Age in years							12	0.000	91.58	S
18–30 years	5	1	1	1	1	1				Significant
31–40 years	55	5	10	16	16	8				
41–50 years	65	4	5	2	4	50				
51 years	75	2	2	2	39	30				
2. Gender							4	0.5298	3.16	NS
Male	115	6	10	12	40	47				Non-significant
Female	85	6	8	9	20	42				
3. Marital status							8	0.764	4.93	NS
Unmarried	55	2	2	7	20	24				Non-Significant
Married	120	8	13	11	33	55				
Widow	25	2	3	3	7	10				
Divorce	00	0	0	0	0	0				
4. Residence							4	0.5381	3.119	NS
Rural	60	4	5	9	14	28				Non-Significant
Urban	140	8	13	12	46	61				
5. Religion							12	0.019	24.12	S
Hindu	105	6	8	9	32	50				Significant
Muslim	45	4	5	4	14	18				
Christian	40	1	3	3	13	20				
Other	10	1	2	5	1	1				
6. Education							12	0.948	5.28	NS
Illiterate	30	2	3	3	8	14				Non-significant
Primary	25	1	2	1	10	11				
Secondary	60	4	6	7	13	30				
Graduate and above	85	5	7	10	29	34				
7. Occupation							16	0.954	6.30	NS
Govt. Employed	10	1	1	1	2	5				Non-significant
Pvt. Employed	90	5	7	11	29	38				
Business	65	3	5	4	20	33				
Housewife	20	2	3	3	5	7				
Unemployed	15	1	2	2	4	6				
8. Monthly family income in rupees							12	0.165	16.58	NS
5,000–10,000 Rs	15	2	3	1	4	5				Non-significant
10,001–15,000 Rs.	30	3	6	5	7	9				
15,001–20,000 Rs	90	5	4	8	31	42				
20,001 and above	65	2	5	7	18	33				
9. Presence of known case of cardiac surgery in family							4	0.9694	0.54	NS
Yes	78	5	8	9	23	33				Non-significant
No	122	7	10	12	37	56				
10. Is there any bad habits							8	0.2436	10.31	NS
Smoking	55	4	9	7	15	20				Non-significant
Drinking alcohol	95	6	5	9	34	41				
Tobacco or Ghutka Chewing	50	2	4	5	11	28				
11. Type of planned surgery							8	0.368	8.69	NS
CABG	135	9	12	17	39	58				Non-significant
ASD	00	0	0	0	0	0				
VSD	00	0	0	0	0	0				
DVR	40	2	4	2	17	15				
MVR	25	1	2	2	4	16				
AVR	00	0	0	0	0	0				
12. Type of diet							4	0.112	7.48	NS
Vegetarian	59	3	8	10	18	20				Non-significant
Mixed type of diet	141	9	10	11	42	69				

CABG: Coronary artery bypass grafting, ASD: Atrial septal defect, VSD: Ventricular septal defect, DVR: Double valve replacement, MVR: Mitral valve replacement, AVR: Aortic valve replacement

patients self-cared more than CABG and VR patients. These characteristics boost self-care and performance (61.2%).[7]

Xue et al. a randomized controlled study found no difference in baseline characteristics between the two groups for all patients who completed the trial. The experimental group had 10.4% delirium compared to 24.2% in the control group ($P = 0.038$). While hospital stays and other issues did not differ between the two groups, the experimental group had significantly shorter mechanical ventilation and intensive care unit (ICU) stays (13.7 ± 7.6 vs. 18.6 ± 9.8 h, $P = 0.002$; 31.3 ± 9.1 vs. 36.5 ± 10.4 h, $P = 0.003$).[8]

AL Amine Ali and Abdallah reveal that two-thirds of patients (79.4%) were unaware of pre-operative planning, but the program enhanced their understanding, which showed in their post-operative behavior and results. In the post-operative period, 70% expressed no to slight worry. After surgery, 70% of patients reported moderate to severe pain after 4 h and 82% reported little to no pain within 12 h. Most patients were satisfied with preparations and results. The study confirms that pre-operative preparation improves patient outcomes. The study found that surgical nurses should educate elective surgical patients on care plan compliance to improve surgical outcomes.[9]

In Al-Qalah et al., the research group averages 40.46 ± 14.13 years old, while the control group averages 38.88 ± 12.47 years old. Pre-test findings showed 82% of the control group and 52% of the study group had insufficient knowledge. In contrast, 84% of the study group and 4% of the control groups showed adequate post-test knowledge. Knowledge, self-care activity performance, early extubation, pain management, reduced analgesic use, brief recovery time, shorter ICU stay, and fewer problems were considerably greater in scheduled pre-operative education patients. This planned pre-operative education intervention may improve self-care, early extubation, pain management, stay, and complications more than not receiving it. Scheduled pre-operative training can prepare patients for cardiac surgery.[10]

CONCLUSION

This study shows that organized pre-operative teaching improves self-care knowledge in cardiac surgery patients. Patient knowledge improves after cardiac surgery.

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