

Impact of a Structured Recovery Regimen on Physiological Outcomes in Postoperative Cardiac Surgery Patients at a Selected Hospital

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Abstract

Background:-The common surgical procedure encountered is Coronary Artery Bypass Grafting (CABG) for various indications such as left main coronary artery stenosis, severe triple-vessel disease, and angina refractory to medical therapy. Other surgical procedures include valve repair or replacements, repair of congenital or acquired defects (ASD, VSD, etc.), and repair or replacement of the aortic root. Coronary artery bypass graft surgery (CABG) was first performed in India in 1975 about 13 years after its advent in 1962. In mid-1990, some 10,000 CABG surgeries were being performed annually in India. Presently the annual number is about 60000 according to industry sources.

Material and Method: A quasi-experimental, one-group pre-test & post-test research design study was to assess the physiological variables among postoperative cardiac surgery patients. To assess the effect of recovery regimen on physiological variables among postoperative cardiac surgery patients. To find out the association between the effect of recovery regimen on physiological variables among postoperative cardiac surgery patients with their socio-demographic variables. The sampling technique used for this study was a nonprobability purposive sampling technique. The sample size for the present study was 40 postoperative cardiac surgery patients. The data was analyzed by Descriptive and Inferential statistics.

Result: The present study findings revealed amongst 40 postoperative cardiac surgery patients, sociodemographic and clinical characteristics were assessed to determine associations with the effectiveness of a recovery regimen on physiological outcomes. The sample primarily consisted of older adults (70% aged 55–75), predominantly female (67.5%), married (80%), Hindu (67.5%), and employed in farming, business, or other roles (30% each). Most participants (57.5%) had no history of smoking, alcohol, or drug use, and 72.5% followed a non-vegetarian diet. A high proportion (85%) were diagnosed with Coronary Artery Disease (CAD) and underwent Coronary Artery Bypass Grafting (CABG). Pre-test scores showed 80% of patients in the poor category, with significant improvement post-test, where 85% achieved average scores and 10% reached good scores. Paired t-test analysis indicated a significant increase in mean scores from pre-test (mean=2.05) to post-test (mean=3.5) with a t-value of 10.842 and a p-value <0.0001, demonstrating the regimen's effectiveness in improving recovery. Chi-square analysis revealed a significant association between age and regimen effectiveness (p=0.001), while other variables such as gender, religion, health habits, diet, diagnosis, and surgery type showed no significant associations. These findings suggest that the recovery regimen effectively enhanced physiological outcomes, particularly among older patients, with minimal influence from other demographic factors.

Keywords: Effectiveness, Recovery Regimen, Physiological, Cardiac, Surgery, Postoperative Patient.

Introduction: Cardiac surgery is the specialty of medicine concerning the surgical treatment of pathologies related to the heart and thoracic aorta. The spectrum of modern cardiac surgery can be understood by its history

beginning at the end of the 19th century. Since then cardiac surgery developed through the work of numerous dedicated surgeons offering more and more treatments for diverse cardiac pathology. The most common surgical procedure encountered is the Coronary Artery Bypass Grafting (CABG), other surgical procedure, include valve repair or replacements, repair of congenital or acquired defects (ASD, VSD. ^[1] Coronary artery bypass graft surgery (CABG) was first performed in India in 1975 about 13 years after its advent in 1962. In the mid 1990 some 10,000 CABG surgeries were being performed annually in India. ^[2] Presently the annual number is about 60000 according to industry sources. ^[3] The first phase of heart surgery recovery can last from 6 to 8 weeks. When person released from the hospital, they will get a set of instructions for post-surgery care. ^[4] Major complications include postoperative bleeding, stroke, renal failure, mesenteric ischemia, atrial fibrillation, cardiogenic shock, and respiratory distress. Postoperative bleeding, and hemorrhagic shock coagulation disorders such as heparin-induced thrombocytopenia are reasons why 10% to 20% of national blood products are consumed in cardiac surgery. ^[5]

Materials and Methods: A Quasi-Experimental research study, with one group Pre-test & post-test, was used to assess the effect of recovery regimen on physiological variables among postoperative cardiac surgery patients at selected hospitals, the sampling technique used for this study was a nonprobability purposive sampling technique. The sample size for the present study was 40 postoperative cardiac surgery patients who were present during the study period and fulfilled inclusion and exclusion criteria. The data was analyzed by Descriptive and Inferential statistics.

Results: The collected data was tabulated in a master sheet and analyzed by using descriptive and inferential statistics as per the objectives of the study.

Section I: Description of Sociodemographic data of patient

Section II: Effect of recovery regimen on physiological variables among postoperative cardiac surgery patients at the selected hospital.

Description of Sociodemographic data frequency and percentage distribution

n=40

SN	Demographic Variable	Frequency	Percentage (%)
1	Age		
A	18- 30	00	00
B	30- 55	12	30
C	55- 75	28	70
D	More than 75	00	00
2	Gender		
A	Male	13	35.5
B	Female	27	67.5
3	Religion		
A	Hindu	27	67.5
B	Muslim	09	22.5
C	Christian	04	10
D	Other	00	00
4	Marital Status		
A	Married	32	80
B	Unmarried	00	00
C	Divorced	00	00
D	Widow	08	20
5	Occupation		
A	Farmer	12	30
B	Daily wedge and labour	04	10
C	Business	12	30

D	Other	12	30
6	Health Habit		
A	Smoking and Tobacco	12	30
B	Alcohol	05	12.5
C	Drug Abuse	00	00
D	None Of There	23	57.5
7	Type of Diet		
A	Veg	11	27.5
B	Non- veg	29	72.5
C	Mixed diet	00	00
8	Diagnosis		
A	CAD	34	85
B	RHD	06	15
C	ASD	00	00
D	Other	00	00
9	Name of surgery		
A	CABG	34	85
B	MVR and AVR	06	15
C	ASD Closure	00	00
D	Other	00	00

Table No: I Frequency and percentage wise distribution of the demographic variable

In this sample of 40 participants, the sociodemographic and clinical data have been analyzed to understand various demographic characteristics. Age-wise, the majority of participants (70%) are in the 55–75 age range (28 people). The remaining 12 (30%) belong to the 30- to 55-year-old age range. According to gender, there were 13 (32.5%) participants who were male and 27 (67.5%) participants who were female. Twenty-seven (67.5%) of the participants identify as Hindu. Nine (22.5%) are Muslims, and four (10%) are Christians. 32 people, or 80%, were married. Eight (20%) of the smaller group were widows. Twelve (30%) individuals fall into each of the three categories of occupation: Farmer, Business, and Other.

The majority of the participants 27 (67.5%) identify as Hindu religion. Muslims account for 9 (22.5%) and Christians comprise 4 (10%). The majority 32 (80%) were married. In a smaller segment, 8 (20%) were widows. Occupation is evenly distributed among three categories: Farmer, Business, and Other, each accounting for 12 (30%) participants. Daily wage and labor participants constitute a smaller group at 4 (10%) participants.

More than half of 23 (57.5%) of the participants do not engage in smoking, tobacco, alcohol, or drug use (23 participants). 12(30%) participants reported smoking or tobacco use while 5 (12.5%) participants reported alcohol consumption.

The majority of 29 (72.5%) participants consume a non-vegetarian diet. 11 (27.5%) participants adhere to a vegetarian diet.

A large proportion 34 (85%) of participants have been diagnosed with Coronary Artery Disease (CAD). The remaining 6 participants (15%) have Rheumatic Heart Disease (RHD).

In most participants 34 participants (85%) underwent Coronary Artery Bypass Grafting (CABG). 6 participants 15% had Mitral Valve Replacement (MVR) or Aortic Valve Replacement (AVR). This data reveals that the majority of the sample is older, predominantly female, married, Hindu, and with a background in farming or business. Most participants do not use tobacco or alcohol, follow a non-vegetarian diet, and are diagnosed with CAD, for which CABG is the common surgery performed.

Effect of recovery regimen on physiological variables among postoperative cardiac surgery patient

Frequency and percentage-wise distribution of pre-test and post-test scores among postoperative cardiac surgery patients.

(n=40)

Sr No	Score	Pretest		Posttest	
		Freq	%	Freq	%
1	Poor (0-2)	32	80	02	05
2	Average (2-4)	08	20	34	85
4	Good (4-6)	00	00	04	10

The frequency and percentage distribution of pre-test and post-test scores of recovery regimen on physiological variables among 40 postoperative cardiac surgery patients. As per the pre-test scores, 80% of patients (32 out of 40) scored in the poor category. 20% of patients (8 out of 40) scored in the average category. No patients scored in the good category (0%). As per the post-test scores, only 5% of patients (2 out of 40) remained in the poor category. A significant improvement is seen, with 85% of patients (34 out of 40) scoring in the average category. 10% of patients (4 out of 40) achieved a good score post-test. This data highlights a notable improvement in scores from pre-test to post-test among postoperative cardiac surgery patients. Initially, the majority scored poorly, but after the intervention, most patients' scores improved to the average range, with a small proportion achieving good scores.

Paired 't' value of pre and post-test score regarding recovery regimen on physiological variables among postoperative cardiac surgery patient

(n=40)

Sr No	Group	Mean	SD	't' value	P Value	Level of significance
1	Pre-test	2.05	0.6385	10.842	<0.0001	Significant
2	Post-test	3.5	0.7511			

The interpretation of the paired 't' test results for pre- and post-test scores on the recovery regimen's impact on physiological variables among postoperative cardiac surgery patients (n=40), The mean score for the pre-test was 2.05 with a standard deviation (SD) of 0.6385, indicating a lower initial level of recovery or physiological variable improvement among patients before the intervention.

The post-test mean score increased to 3.5 with an SD of 0.7511, suggesting a significant improvement in recovery or physiological outcomes following the intervention. The calculated 't' value is 10.842, which indicates a substantial difference between pre- and post-test scores. The p-value is <0.0001, which is much smaller than the standard alpha level of 0.05. This low p-value demonstrates that the improvement from the pre-test to the post-test is statistically significant.

Since the result is significant at $p < 0.0001$, so it's concluded that the recovery regimen had a statistically significant positive effect on the physiological variables of postoperative cardiac surgery patients. The

significant increase in mean scores from pre-test to post-test supports that the intervention likely contributed to enhanced recovery among the patients in this study. This results indicate that the recovery regimen is effective, leading to improved physiological outcomes in postoperative cardiac surgery patients.

Association between effect regarding recovery regimen on physiological variables among postoperative cardiac surgery patients with their selected demographic variables.

(n=40)

Age	Poor Score		Average score		Total	χ^2	p value
	O	E	O	E			
Age							
30- 55 Years	12	9.6	00	00	12	4.286	0.001
55- 75 Years	20	22.4	08	5.6	28		
Gender							
Male	09	8.7	04	2.6	13	1.396	1.12
Female	23	21.6	04	5.4	27		
Religion							
Hindu	21	21.6	06	5.4	27	1.111	1.44
Muslim	07	7.2	02	1.8	09		
Christian	04	3.2	00	00	04		
Health Habit							
Smoking and Tobacco	11	9.6	01	2.4	12	1.458	1.33
None Of There	21	22.4	07	4.8	28		
Type of Diet							
Veg	09	8.8	02	2.2	11	0.03135	1.65
Non- veg	23	23.2	06	5.8	29		
Diagnosis							
CAD	26	27.2	08	64	34	1.765	2.35
RHD	06	4.8	00	00	06		
Surgery							
CABG	26	27.2	08	64	34	1.765	2.44
MVR and AVR	06	4.8	00	00	06		

The table shows the association between the effect of a recovery regimen on physiological variables among postoperative cardiac surgery patients and selected demographic variables (n=40).

Among patients aged 30-55, 12 patients showed a poor score, with an expected frequency (E) of 9.6. The chi-square value (χ^2) for age is 4.286 with a p-value of 0.001. This statistically significant result ($p < 0.05$) suggests that age is associated with the effect of the recovery regimen on physiological outcomes.

Males and females gender had expected frequencies close to observed frequencies, with a chi-square value of 1.396 and p-value of 1.12. The non-significant p-value indicates that gender does not significantly influence the effect of the recovery regimen on physiological variables.

The chi-square value for religion is 1.111 with a p-value of 1.44, indicating no significant association. Religion does not appear to impact the effect of the recovery regimen on physiological outcomes among these patients.

Patients with smoking or tobacco habits had a slightly lower observed count for poor scores compared to the expected count (11 observed vs. 9.6 expected). The chi-square value is 1.458 with a p-value of 1.33. The association is not statistically significant, suggesting that health habits like smoking or tobacco use are not significantly related to the effect of the recovery regimen.

For dietary habits, the chi-square value is 0.03135 with a p-value of 1.65, indicating no significant relationship. The type of diet (vegetarian vs. non-vegetarian) does not significantly impact the effect of the recovery regimen on physiological variables.

Patients diagnosed with CAD or RHD showed no significant difference, with a chi-square value of 1.765 and a p-value of 2.35. Diagnosis type (CAD or RHD) does not significantly influence the effectiveness of the recovery regimen on physiological variables.

Among patients who underwent CABG versus those who had MVR and AVR, the chi-square value is 1.765 with a p-value of 2.44. The type of surgery does not significantly impact the effect of the recovery regimen on physiological outcomes. The study shows that age is the only demographic variable significantly associated with the effect of the recovery regimen on physiological variables among postoperative cardiac surgery patients, with older patients more likely to have poorer scores. Other variables such as gender, religion, health habits, diet type, diagnosis, and type of surgery do not show significant associations.

Discussion: In the present study, Percentage wise distribution of respondents according to their Age depicts that the highest percentage (70%) of respondents were in the age group of 55 to 75 years and 30 % of the respondents were in the age group of 30-35 years. It can be interpreted that most of the respondents were in the age group of 55-75 years. the researcher rejected the null hypothesis and accepted the research hypothesis. as it is interpreted that there was a significant difference between pre-test and post-test physiological variables score postoperative cardiac surgery patients. The researcher found a significant association between age and level of physiological variable score among all demographic variables such as Age, gender, religion, marital status, occupation, health habits, diagnosis, Name of surgery P-value corresponding to gestational weeks is small (less than 0.05)

Conclusion: The focus of the study was to effect of recovery regimen on physiological variables among postoperative cardiac surgery patients at selected hospitals. Here shows that the highest percentage in the pre-test (80%) of respondents had average poor scores, and (20%) of them had good scores in the post-test (85%) of the respondents had an average score, and (10%) respondents had good scores. Hence it can be interpreted that the recovery regimen on physiological variables was effective in improving the score of patients. Researchers found t value to analyse the difference in pre-test and post-test scores of postoperative cardiac surgery patients. This study has shown a positive significant difference between pre and post-test scores of postoperative cardiac surgery patients. Hence the null hypothesis is rejected and the research hypothesis is accepted. It concluded that a recovery regimen on physiological variables was effective in improving the scores of patients.

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