

Effectiveness of Exercise Based Cardiac Rehabilitation on Selected Cardiac Parameters among Postoperated CABG Patient in Selected hospital

IJSN
Volume 9, Number 1
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Mighila M Nair¹, Amol C Temkar², Suresh T Saravade³

Abstract

Background: As the concept of nursing is changing fast, nursing is not only caring for the sick but takes care for prevention of illness, promotion and maintenance of health. The nurses multiple roles in cardiac rehabilitation have a “spider in the web like” character and depending on the phase of the patients recovery he/she acts as a counsellor, a coach an educator. The study conducted with the aim and objectives of observing the effect of exercise based cardiac rehabilitation on selected cardiac parameters respectively. (1) Heart rate (2) Respiratory rate (3) Blood pressure (4) Saturation of peripheral oxygen (5) Mean arterial pressure (6) Rate pressure product.

Material and Method: A pre-experimental one group-pre-test post-test design study was selected for the study 40 samples were selected by non probability purposive sampling technique, among hospital admitted patient those who full filled the inclusion criteriasuch as postoperated CABG patient who has completed 48 hours after surgery, admitted in selected cardiac unit, with stable regimen, both male and female patients was included. Exclusion criteria were patient with severe critical condition, strict bed rest advised and unconscious patient. Exercise based cardiac rehabilitation activity such as warm up exercise, diaphragmatic breathing exercise, active exercise of extremities, positioning, coughing, huffing, incentive spirometry and ambulation were administered to the patient as per the scheduled duration. Modified observational checklist was used to assess the selected cardiac parameters during pre & post-test. Baseline data was collected from patient records. Validity done and reliability of checklist is 0.98.

Result: Showed that *t*-value of effectiveness of exercise based cardiac rehabilitation on selected cardiac parameters ($t = 3.46$ with df_{10}) were found more than table value 2.09 at 0.05 level significant.

Inference: Hence the exercise based cardiac rehabilitation was found to be effective in terms of cardiac parameters for post CABG Patient.

Conclusion: Hence the study finding revealed that the exercise based cardiac rehabilitation found to be effective and helpful in improving the cardiac functioning and parameter among postoperated CABG patient. Prolong or continuous performance of selected exercises will help the patient to maintain the cardiac health.

Keywords: Postoperated CABG; Exercise based cardiac rehabilitation; Cardiac parameters; Saturation of peripheral oxygen; Mean arterial pressure and Rate pressure product.

How to cite this article:

Mighila M Nair, Amol C Temkar, Suresh T Saravade. Effectiveness of Exercise Based Cardiac Rehabilitation on Selected Cardiac Parameters among Postoperated CABG Patient in Selected hospital. Indian J Surg Nurs. 2020;9(1):31-36.

Author Affiliation: ¹Tutor, ²Associate Professor, Dr. V.V.P.F's College of Nursing, Vilad Ghat, Ahmednagar, Maharashtra 414111, India. ³Lecturer, Kamalnayan Bajaj Nursing College, Aurangabad, Maharashtra 431010, India.

Corresponding Author: Amol C Temkar, Associate Professor, Dr. V.V.P.F's College of Nursing, Vilad Ghat, Ahmednagar, Maharashtra 414111, India.

E-mail: mighilanair@gmail.com

Received on 01.02.2020, Accepted on 03.02.2020

Introduction

Human heart is an organ that pumps blood throughout the body via the circulatory system, supplying oxygen & nutrients to the tissues and removing carbon dioxide and other wastes.¹ Coronary heart disease is epidemic in India and is one of the major causes of disease burden and

deaths, many factors leading to cardiovascular disease can be controlled or modified.² Cardiac rehabilitation is becoming an integral part of comprehensive care it can be lifesaving and goal oriented process that enables people with acute or chronic disorders where teaches the cardiac client how to be more active and make lifestyle changes.³ Cardiac rehabilitation programmes are intended to enhance the effect of acute treatment actions and to prevent risk factors by involving medical evaluation, supervised exercise, education and counselling of patients into the specific recognized phases which helps patients to lead an improvement in their wellbeing and recovery.⁴ Coronary artery bypass graft means an operation carried out to bypass a coronary artery narrowed by the atherosclerosis using a graft from a healthy saphenous vein or an internal mammary artery.⁵ Thus the findings of study signifies that there is effectiveness of exercise based cardiac rehabilitation on selected cardiac parameters where the cardiac rehabilitation exercise significantly improves functional capacity and some hemodynamic responses such as resting and maximum systolic and diastolic blood pressure, resting and maximum heart rate, ejection fraction and rate pressure product. Exercise based cardiac rehabilitation (ECR) is the activity requiring physical effort which is done especially as supervised or unsupervised inpatient, outpatient or community or home based intervention which is well documented, effective and safe especially to improve health return to more active lifestyle and to prevent or diminish postoperative complications.⁶ Physical therapy treatment is often prescribed and the physiological parameters are targeted by the pillars of cardiac rehabilitation which include actionable themes of improvement in exercises such as warm-up exercise, early mobilization range of motion exercise, deep breathing and incentive Spirometry exercises which shows improvement in maintaining blood pressure, heart rate, respiratory rate, oxygen saturation and rate pressure product.⁷ It is observed that a very less emphasis is given on rehabilitation of patient with coronary artery bypass graft. On the other hand the incidence of cardiovascular disease related morbidity is increased up to the high. Many services, studies and reviews identified the mortality due to unplanned cardiac rehabilitation of the postoperated coronary artery bypass graft patients. It is revealed that the failure rate of coronary artery bypass graft is associated with lack of awareness and knowledge regarding cardiac rehabilitation. So by considering the seriousness the researcher felt the need to conduct a study on exercise based

cardiac rehabilitation to promote awareness and improves cardiac function in patient postoperated with coronary artery bypass graft.

Problem Statement

Effectiveness of exercise based cardiac rehabilitation on selected cardiac parameters among postoperated CABG patient in selected hospital.

Objectives of the Study

1. To assess the effect of exercise based cardiac rehabilitation on selected cardiac parameters of postoperated CABG patients.
2. To find the relationship between pre and post exercise based cardiac rehabilitation on selected cardiac parameters among postoperated CABG patients.
3. To find out the association between post exercise based cardiac rehabilitation on selected cardiac parameters with selected demographic variables.

Hypothesis

(All hypothesis will be tested at 0.05 level of significance).

2. H_0 : There will be no significant effect of exercise based cardiac rehabilitation on Selected cardiac parameters of postoperated CABG patients.
3. H_1 : There will be significant effect of exercise based cardiac rehabilitation on Selected cardiac parameters of postoperated CABG patients.

Ethical Aspect

To obtain ethical committee approval for conducting research study, permission was taken from institutional ethics committee. Written informed consent was taken from the patient after informing details regarding research study, its benefits and effect of participation in the research study.

Conceptual Frame Work

Conceptual framework for present study is based on Imogene King goal attainment theory. King goal attainment theory has four major concepts of human beings, health, environment and nursing. The major concepts phenomenon are described as perception, judgement, action, interaction, transaction and feedback.

Review of Literature

Review literature is a key step in research process. Review of literature refers to an extensive, exhaustive and systematic examination of publications relevant to research project. An extensive review of related literature enabled the researcher to develop the conceptual frame work, tool, selection of research design and plan for data analysis. Review of literature for the present study is divided under two aspects:

- A Literature review related to exercise based cardiac rehabilitation.
- B Literature review related to effect of exercise based cardiac rehabilitation on cardiac parameters.

Materials and Methods

Research approach

Researcher selected experimental approach for this research study.

Research design

Research design adopted for the present study is pre-experimental one group pre-post-test study design.

Research study setting

Present study was conducted in cardiac unit of selected hospital.

Population

The study population was postoperated CABG patients in selected hospital.

Sample size

In this study the sample size consisted of 40 patients.

Sampling technique

Non probability purposive sampling technique was used to select the sample.

Method of Selection of Study Subjects/Eligibility Criteria

A Inclusion criteria: Postoperated CABG patient admitted in selected cardiac unit, who has completed 48 hours after surgery, both male and female patients with stable medication regimen will be included.

B Exclusion criteria: Postop CABG patient with severe critical condition such as unconscious patient, intubated patient and strictly bed rest advised patients.

Tool

Tool consists of baseline performa, Modified Observational Checklist for Cardiac Parameters.

Part A: Baseline Performa of postoperated CABG patient such as Age in years, Gender, Religion, Marital status, Educational status, Occupation, Physical activity, Mental activity, Type of family, Type of diet, Diagnosis of CABG, Associated conditions and Ejection fraction value.

Part B: Modified Observational Checklist for Cardiac Parameters to observe, asses and record the effectiveness of exercise based cardiac rehabilitation on selected cardiac parameters such as (Heart rate, Respiratory rate, Blood pressure, Saturation of peripheral oxygen, Mean arterial pressure, Rate pressure product) of postoperated CABG patients. It includes the following aspects:

Part I: Pre-test reading of the selected cardiac parameters is observed during the day first before intervention.(i.e 24 hrs after CABG).

Table 1: Intervention

S. No	Administered Intervention (Exercise based cardiac rehabilitation activity)	Duration	Relaxation time
1.	Warm up		4 min
2.	Diaphragmatic breathing exercise	5 min	3 min
3.	Active exercise of extremities	4 min	3 min
4.	Positioning	4 min	2 min
5.	Coughing	2 min	1 min
6.	Huffing	3 min	1 min
7.	Incentive Spirometry	5 min	2 min
8.	Ambulation	3 min	3 min

Part II: Administer Intervention schedule till patient is hospitalized.

Part III: Post-test reading of the selected cardiac parameters is observed during the first follow up i.e. (Day 14)

Method of Analysis

The data obtained was analyzed and interpreted by descriptive and inferential statistics based on the objectives of the study.

Results

Section I: Baseline Performa

Analysis of section I revealed that majority of

post- operated CABG patient 45% belong to age group of 51–60 years, 65% male gender and hindu religion, 87.5% married group, 32.5% educated upto secondary group, 40% belong to homemaker group, 35% belong to sedentary activity category, 67.5% postoperated CABG patient were from nuclear family, 62.5% belong to mix veg, 80% were diagnosed with Tripple vessel disease, 37.5% belong to hypertension group only and 42.5 % belong to 40–54% ejection fraction category.

Section II: Analysis of data related to the effectiveness of cardiac rehabilitation program.

Table 1 and graph 1 revealed the main findings that mean, standard deviation and mean percentage of post-test cardiac parameters is significantly decreased than the pre-test assessment of cardiac parameters.

Table 1: Analysis of data related to the effectiveness of cardiac rehabilitation program

Parameter	Pre-test			Post-test		
	Mean	SD	Mean %	Mean	SD	Mean%
Heart rate	1.12	0.33	9.37	1.00	0.00	8.33
Respiratory rate	1.62	0.48	13.54	1.12	0.33	9.33
Blood pressure	1.37	0.48	11.45	1.12	0.33	9.33
Saturation of oxygen	1.25	0.43	16.41	1.00	0.00	8.33
Mean arterial pressure	1.5	0.5	12.5	1.42	0.49	11.83
Rate pressure product	1.5	0.5	12.5	1.12	0.33	9.33

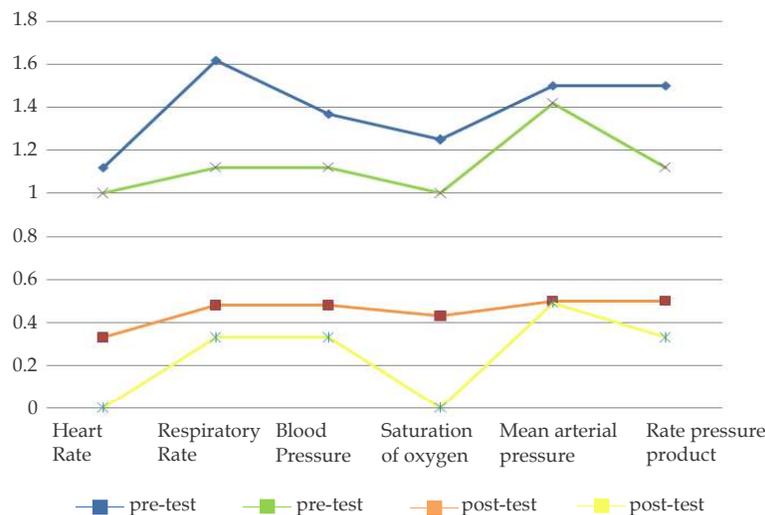


Fig. 1: Effectiveness of cardiac rehabilitation programme.

Section III: Overall level of complications

- In pre-test the majority of subject 22 (55%) belong to mild deviation category, 13 (32.5%) belong to moderate deviation, 3 (7.5%) no deviation and 2 (5%) belong to severe 11 and above category.
- In post-test the majority of subject 20 (50%) belong to mild deviation category, 18 (45%) belong to no deviation, 2 (5%) moderate deviation and 0% belong to severe deviation category.

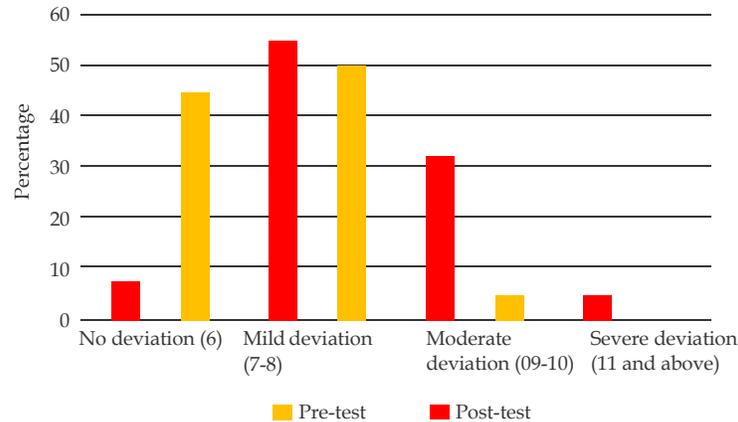


Fig. 2: Overall level of complications.

Section IV: Analysis of data to find relationship between mean score pre and post exercise based cardiac rehabilitation

The pre-test total mean percentage reading of cardiac parameters was 69.66% with a mean \pm SD of 8.36 ± 2.72 and post-test reading of cardiac parameters is decreased by mean percentage 56.5% with a mean \pm SD of 6.78 ± 1.48 after the intervention programme (Exercise based cardiac rehabilitation activity). The *t*-value of effectiveness of exercise based cardiac rehabilitation on selected cardiac parameters *t* (8.62) were found more than the table value (1.68), with the degree of freedom 39.

Section IV: Association of selected cardiac parameters with selected demographic variables

Chi-square values were calculated to find the association of cardiac parameters with their selected baseline performa. The study findings reveals that there was significant association of cardiac parameters with their baseline performa like physical activity ($\chi^2 = 4.71$), Diagnosis of CABG ($\chi^2 = 4.27$), associated condition ($\chi^2 = 6.50$) and ejection fraction ($\chi^2 = 11.90$) which is highly significant.

Implications of the Study

The present study findings have implications for nursing practice, nursing educations, nursing administrations, and nursing research.

Nursing Practice

- Nursing profession has been developing faster in recent years in a unique way. The major change that has occurred in the profession is expansion in the role of nurses.

Cardiac rehabilitation nurse plays an integral role in caring for and assisting patients who are recovering from and managing their cardiovascular problems.

- Findings of the present study would help nurses and other healthcare personnel to know the need of exercise based cardiac rehabilitation activity for the postoperated coronary artery bypass graft patient. It is one of the most effective interventions.

Nursing Education

- As a nurse educator there are abundant opportunities for nursing professionals to educate/teach students in their curriculum about the cardiac rehabilitation program specifically about exercises importance and effectiveness for decreasing the level of complications and improving the cardiac functioning and parameter among postoperated cardiac patients
- More encouragement should be given in conducting the induction training, workshop, seminars for the staff nurses and education for family members regarding the identification of health problems and taking necessary steps to resolve them by organizing health education programme for better practice.

Nursing Administration

- Nurse personnel should be prepared to take leadership role in training the staff, educating students, guide, advice support and assist the patient in adapting an altered lifestyle related to cardiac rehabilitation activities and its effect on cardiac parameters.
- The administrator has to arrange training

programs, in service education or continuing education classes in such a way that each staff gets exposure of the training program and can introduce the safe practices and physical activity recommended for cardiac patients after surgery to maintain the cardiac functioning.

Nursing Research

- Findings of the study will motivate the researchers to conduct same study with different variables on a large scale.
- Evidence based practice with different treatment modalities for stabilizing cardiac parameters of postoperated CABG Patients can add the knowledge area in the field of research.

Limitations

- The study was limited only for CABG patients.
- Only selected exercises were assessed in cardiac rehabilitation activity.
- Small number of subjects limits generalization of the study.
- Study has been maintained only for 14 days.

Recommendations

- A similar study can be conducted on large scale by adding more sample size to draw more definite conclusion and make generalization.
- Alike studies can be undertaken with a control group.
- Cardiac surgeries other than CABG can be included.
- Exercises and alternative treatment modalities can be done for more specific result.

- Cardiac rehabilitation programme can be started immediately during the time the client is diagnosed with CABG.

Conclusion

“Every heart that beats strongly and cheerfully has left a hopeful impulse behind it in the world and bettered the tradition of mankind”

Hence the exercise based cardiac rehabilitation found to be effective and helpful in improving the cardiac functioning and parameters among post-operated CABG patients.

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