



## Effects of two Different Packages of Cardiac Rehabilitative Protocols on Ejection Fraction, Oxygen Saturation and Stress among Coronary Artery Bypass Grafted Male Patients

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### Abstract

**Aim of the study:** To determine the two different intensity of cardiac rehabilitative protocols on physiological and psychological variables among coronary artery bypass graft male patients

**Method of the subject:** Experimental design with 45 subjects randomly divided into three equal groups with control, experimental group I and II. The age group was between 45-60 were selected for this study.

**Variables:** Ejection fraction, Oxygen Saturation (PaSO<sub>2</sub>), Anxiety

**Result:** Since in this study the researcher found that there was good change in the improvement in Ejection Fraction, Oxygen Saturation (PaSO<sub>2</sub>) and Anxiety in the Experimental Groups when compared with control group

**Conclusion:** Hence it's concluded that that the Ejection Fraction, oxygen saturation rate was increased and was reduced from their higher abnormal level to normal level after 12 weeks of Cardiac Rehabilitative Protocols training period.

### Introduction

Cardiovascular disorders are an important public health problem worldwide. They are also the leading cause of mortality and morbidity in the industrialized world. The annual cardiovascular mortality rate was reported as 0.8%. In the United States alone, over 14 million persons suffer from heart disease. In addition, there is evidence of a quick increase in heart disease along the Asian region. It is important to note that the disease accounts for 46% of overall mortality are cardiovascular diseases in Iran. CABG has been used for the treatment of coronary artery disease for nearly 50 years, and has been performed for millions of people worldwide. However, little is

known about the impact of lifestyle changes, including diet and exercise, on long-term outcomes in patients who have had coronary artery bypass graft surgery. Cardiovascular disorders are an important public health problem worldwide. They are also the leading cause of mortality and morbidity. Therefore, American Heart Association proposed cardiac rehabilitation program as an essential part of care for cardiac patients to improve functional capacity

### Statement of the Problem

The researcher has decided to take up different combination of packages of cardiac rehabilitative protocols in coronary artery bypass graft patients.

Hence the investigator is very much intent to adopt the concept to find out the different packages of cardiac rehabilitative protocols with the variables Cardiopulmonary& psychological variables in coronary artery bypass grafted patients

**Selection of Variables:** Ejection Fraction, Oxygen Saturation & Anxiety

**Experimental Design:**The study consisting of forty five CABG subjects randomly divided into three groups, the group was assigned as an experimental group I&II and control group with pre and post test analysis

**Training Schedules and Supplementation**

During the training period, the experimental group underwent incentive spirometry and breathing exercise walking program period of twelve weeks for all days where as control group also same

exercise without monitoring and also no specified protocols followed.

**Statistical Technique:** Analysis of Covariance statistical technique was used, to test the significant difference among the treatment groups. Thirumalaisamy R. (2004).

**Computation of Analysis of Covariance:** The following tables illustrate the statistical results of Effects Of exercise protocols Among CABG and ordered adjusted means and the difference between the means of the groups under study.

**Results of the Study**

**The results of the study showed for the following variables**

The following tables illustrated the statistical results of the effects of different intensity of exercise on Ejection Fraction in Coronary Artery Bypass Grafting Subjects and ordered adjusted means of the groups under study.

**Table- I** Computation of Analysis of Covariance of Ejection Fraction (Scores in percentage)

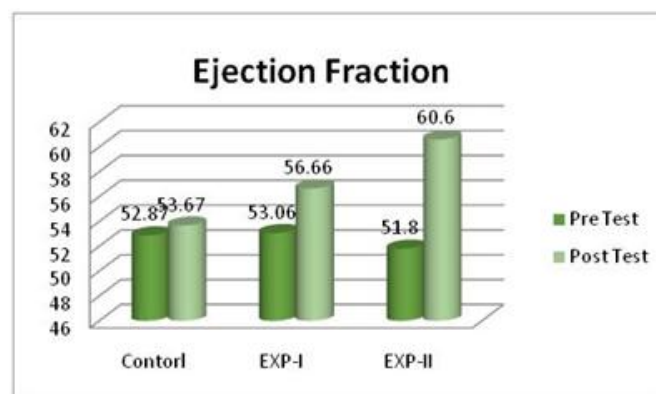
TEST	Control G	EXP-I	EXP-II	SV	SS	DF	MS	OF	TF
pre test	52.87	53.06	51.80	B	13.91	2	6.95	0.19	3.1
				W	1527.07	42	36.36		
post test	53.67	56.66	60.60	B	362.71	2	181.36	10.46	3.1
				W	728.27	42	17.34		
Adjusted	53.51	56.40	61.02	B	426.89	2	213.45	30.11	3.1
				W	290.66	41	7.09		

\*Significant at 0.05 level of confidence for 2and 42 (d f) =3.1 and 41 (df) =3.1

**Results of the Ejection Fraction**

Table I shows analyzed data on Ejection Fraction. The Pre Test means of Ejection Fraction were 52.87 for Control Group, 53.06 for Experimental Group I and 51.80 for Experimental Group II. The obtained ‘F’ ratio 0.19 was lesser than the table ‘OF’ ratio 3.1. Hence, the pretest was significant at 0.05 level of confidence for degrees of freedom 2 and 42.

The Post Test means were 53.67 for Control Group, 56.66 for Experimental Group I and 60.60 for Experimental Group II. The obtained ‘F’ ratio 10.46 was higher than the table ‘OF’ ratio 3.1. Hence, Post Test was significant at 0.05 level of confidence for the degrees of freedom 2 and 42



The adjusted Post Test means were 53.51 for Control Group, 56.40 for Experimental Group I and 61.02 for Experimental Group II. The obtained ‘F’ ratio 30.11 was higher than the table ‘F’ ratio 3.1. Hence, the adjusted post test was

significant at 0.05 levels for the degrees of freedom 2 and 41. The results were found to be in good agreement with earlier works done by different researchers. Since in this study the

researcher found that there was good change in the improvement in Ejection Fraction in the Experimental Groups.

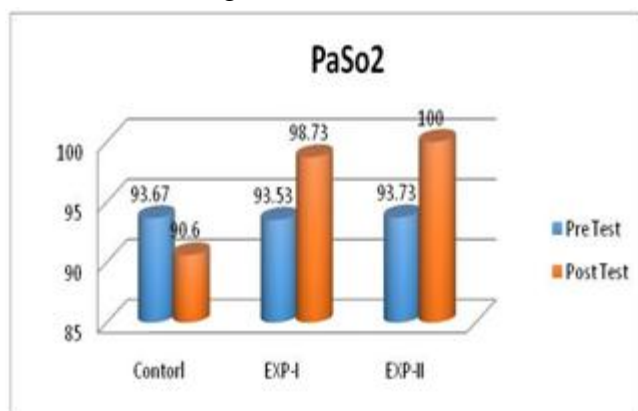
**Table II** Computation of Analysis of Covariance of PASO2

TEST	Control G	EXP-I	EXP-II	SV	SS	DF	MS	OF	TF
pre test	93.67	93.53	93.73	b	0.31	2	0.156	0.05	3.1
				w	120	42	2.86		
post test	90.6	98.73	100	b	780.58	2	390.29	113.41	3.1
				w	144.53	42	3.44		
Adjusted	90.61	98.71	100.02	b	780.08	2	390.04	116.64	3.1
				w	137.1	41	3.34		

\*Significant at 0.05 level of confidence for 2 and 42 (df) = 3.1 and 41 (df) = 3.1

**Results of the PASO2**

Table II shows analyzed data on PASO2. The Pre Test means of PASO2 were 93.67 Experimental Group I, 93.53 for Experimental Group II, 93.73 for Experimental Group III. The obtained ‘F’ ratio 0.03 was lesser than the table ‘F’ ratio 3.1. Hence, the pre test was not significant at 0.05 level of confidence for degrees of freedom 2 and 42.



The Post Test means were 90.60 for Experimental Group I, 98.73 for Experimental Group II, 100.00 for Experimental Group III. The obtained ‘F’ ratio 113.41 was higher than the table ‘F’ ratio 3.1. Hence, Post Test was significant at 0.05 level of confidence for the degrees of freedom 2 and 42. The adjusted Post Test means were 90.61 for Experimental Group I, 98.71 for Experimental Group II, and 100.02 for Experimental Group III. The obtained ‘F’ ratio 111.64 was higher than the table ‘F’ ratio 3.1. Hence, adjusted post test was

significant at 0.05 levels for the degrees of freedom 2 and 42.

Oxygen Saturation it indicates that amount of oxygen travelling through your body with your Red blood cells. The measurement of oxygen saturation is crucial in the management and comprehension of patient care. Because hypoxemia can have a variety of acute negative effects on various organ systems, oxygen is strictly regulated inside the body. The brain, heart, and kidneys are among them. Oxygen saturation is a measurement of how much hemoglobin is currently bound to oxygen against how much is unbound. Hemoglobin is made up of four globular protein subunits at the molecular level.

Hence this saturation will be plays a major role in the CABG, as its maintain the normal level, patient will be good in pulmonary status, and he can be moved to post operative ward and he can be discharged on 7<sup>th</sup> post op day itself.

**Table – III** Computation of Analysis of Covariance Anxiety

TEST	EXP-I	EXP-II	EXP-III	SV	SS	DF	MS	OF	TF
Pre Test	9.33	8.80	9.27	B	2.53	2	1.267	1.14	3.1
				W	46.67	42	1.11		
Post Test	2.8	1.47	2.13	B	13.33	2	6.67	7.39	3.1
				W	37.87	42	0.90		
Adjusted	2.79	1.48	2.13	B	12.35	2	6.18	6.70	3.1
				W	37.792	41	0.92		
Mean Gain	6.53	7.33	7.13						

\*Significant at 0.05 level of confidence for 2 and 42 (df) =3.1 and 41 (df) =3.1

### Results of the Variable Anxiety

Table III shows analyzed data on Anxiety .The Pre Test means of Anxiety were 9.33 for Experimental Group I, 8.80 for Experimental Group II, and 9.37 for Control Group. The obtained 'F' ratio 1.44 was lesser than the table 'F' ratio 3.1. Hence, the pre test was not significant at 0.05 level of confidence for degrees of freedom 2 and 42.

The Post Test means were 2.8 for Experimental Group I, 1.47 for Experimental Group II, and 2.13 for Control Group. The obtained 'F' ratio 7.39 was higher than the table 'F' ratio 3.1. Hence, Post Test was significant at 0.05 level of confidence for the degrees of freedom 2 and 42

The adjusted Post Test means were 2.79 for Experimental Group I, 1.48 for Experimental Group II, and 2.13 for Control Group. The obtained 'F' ratio 6.70 was higher than the table 'F' ratio 3.1hence; adjusted post test was significant at 0.05 levels for the degrees of freedom 2 and 42.

**Hans bernd Rothenhausler et al (2005)** conducted a prospective fallow up study in CBAG, The natural history of psychiatric morbidity, postoperative delirium, cognitive decline, and health-related quality of life (HRQOL) in cardiac surgery patients, as well as the impact of neurocognitive dysfunction on HRQOL following cardiopulmonary bypass surgery, are poorly understood. Since the results obtained from the Analysis of Covariance in very good agreement with the earlier results, it is worthwhile to mention that high intensity Training is one of the better training methods to sustain the Stress level. This in turn helps to be

healthy, life style changing to the CABG Persons. The severity of depression and anxiety problems improved and returned to preoperative levels after 12 months, and 6 of the 30 patients who were followed up on showed cognitive abnormalities. When compared to baseline quality of life data, our patients' HRQOL SF-36 self-reports improved dramatically. However, lower total cognitive function scores over time were linked to decreased HRQOL.

Hence this study also has done for 12 weeks of training programme, and patients were very co operative and all the patients will have anxiety that, will they be return back to their normal life. In this study also the patients had the same, but we have given the exercise programme and make the patient to be involve in the each and exercise and improve their chest mobility and as well as well being of their normal life

Since the results obtained from the Analysis of Covariance in very good agreement with the earlier results, it is worthwhile to mention that high intensity Training is one of the better training methods to sustain the Anxiety level. This in turn helps to be healthy, life style changing to the CABG Persons

### Discussion on Findings of Study

Coronary artery bypass grafting is the most commonly performed procedure by surgeons. According to the American Heart Association, coronary artery bypass graft surgeries are among the most commonly performed major operations. CABG surgery is advised for selected groups of patients with significant narrowing and blockages of the heart arteries (coronary artery disease)

1. The findings of **Fatih Lslamoglu et al (2002)** investigate the predictors of postoperative outcome and to evaluate the effectiveness of Coronary artery bypass grafting. In this study the researcher found that with low ejection fraction had Low mortality and morbidity rates, as well as satisfactory postoperative improvements in functional capacity and LVEF values by performing the exercise training .In this study also the researcher noted that Ejection Fraction was maintained in the normal range. **Paolo Nardi et al** investigated a study to find the long-term results after in Coronary Artery Bypass Grafting patients with preoperative left ventricular ejection fraction (LVEF) of 0.35 or less. They have seen 302 patients; in their survey maximum number of patients had good improvement in their Ejection fraction in long term.
2. The product of arterial-venous oxygen saturation differences and blood flow is one description of oxygen consumption within the body. Aerobic metabolism is one way in which the body consumes oxygen. When oxygen is utilized to convert glucose to pyruvate, two molecules of adenosine triphosphate are released (ATP). The oxygen-hemoglobin dissociation curve is a crucial part of this process. Hemoglobin quickly binds free oxygen to produce oxyhemoglobin in the blood, leaving just a little amount of free oxygen dissolved in the plasma. The oxygen-hemoglobin dissociation curve is a graph of hemoglobin % saturation as a function of oxygen partial pressure (PO<sub>2</sub>). Hemoglobin will be 100 percent saturated with oxygen at a PO<sub>2</sub> of 100 mmHg, indicating all four heme groups will be bound. **Julia Alencar Renault et al (2009)** conducted a study to compare the effects of deep breathing exercises (DBE) and flow-oriented incentive spirometry (IS) in patients who had coronary artery bypass grafting (CABG): FVC is for forced vital capacity,

FEV1 stands for forced expiratory volume in one second, and O<sub>2</sub> saturation stands for maximal respiratory pressures with 36 Patients showed better changes in saturation.

3. **Donna Fitzsimons et al (2003)** investigated a qualitative and quantitative analysis on CABG. The purpose of this study was to describe the types and level of anxiety that patients who were scheduled for coronary artery bypass surgery experienced. In this prospective, cross-sectional study, a qualitative interview and the State Trait Anxiety Inventory were used. The purpose of this study is to identify the key sources of anxiety mentioned by the participants. As a result, a better understanding of these patients' requirements may be facilitated, and particular therapies to help alleviate the problem may be developed.

From these analyses, it is found that the results obtained from the experimental groups had significantly shown that they were improved their normal life before to the surgery, and after CABG, this is due to all the patient has undergone their protocols in time and as well as fallow the roles and regulation.

### Conclusion

Coronary artery disease CAD is also known as ischemic heart disease, is a group of diseases that includes: stable angina, unstable angina, myocardial infarction and sudden cardiac death. It is within the group of cardiovascular diseases of which it is the most common type Experimental groups showed significantly greater increase on Ejection Fraction, oxygen saturation and greater reduction in Anxiety than that control group at the end of twelve week of cardiopulmonary training with walking. Experimental group II showed significantly greater increase on Ejection Fraction, oxygen saturation and greater reduction in Anxiety than that Experimental group I at the end of twelve week period of time. It is concluded that the experimental groups had greater improvement in Ejection Fraction, Oxygen Saturation and

decreasing anxiety in the CABG subjects, due to influence of cardiac rehabilitative protocols for a period of twelve week training

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