RESEARCH ARTICLE

GENDER BASED DIFFERENCE IN QUALITY OF LIFE AFTER PHASE II CARDIAC REHABILITATION IN PATIENTS WITH CORONARY ARTERY BYPASS GRAFT SURGERY

1. Physical Therapist, Department of Physical Therapy, Shifa International Hospital Islamabad Pakistan
2. Research Associate, Helping Hand Institute of Rehabilitation Sciences, Mansehra, Pakistan
3. Physical Therapist, Islamabad International Hospital & Research Centre, Islamabad Pakistan
4. Consultant Cardiac & Thoracic Surgeon, Shifa International Hospital, Islamabad Pakistan
5. Assistant Professor, Department of Sociology, Allama Iqbal Open University, Islamabad Pakistan
6. Associate General Manager, Shifa International Hospital, Islamabad

Correspondence

Mehwish Anwar Rana
Physical Therapist, Department of Physical Therapy, Shifa International Hospital Islamabad Pakistan
E-mail: mah_wish@yahoo.com

Received on: 26-06-2019

Revision on: 17-10-2019

Published on: 31-12-2019

Citation

Rana MA, Batool U, Khan S, Akbar MT, Haider SI, Khan MK. Gender based difference in quality of life after phase II cardiac rehabilitation in patients with coronary artery bypass graft surgery. T Rehabil. J. 2019;03(02);131-136. doi: [21-2017/re-trivolo3iss02p131](https://doi.org/10.21201/trivolo3iss02p131)

Mahwish Anwar Rana¹: Analysis & interpretation of data, writing; Revised and Accountable for all aspects

Unaiza Batool²: Analysis & interpretation of data, writing; Revised and Accountable for all aspects

Sarfraz Khan³: Writing; Revised and Accountable for all aspects

Muhammad Tauqeer Akbar⁴: Revised and Accountable for all aspects

Syed Imran Haider⁵: Revised and Accountable for all aspects

Muhammad Kashif Khan⁶: Revised and Accountable for all aspects

ABSTRACT

Objective: To determine the gender based differences in quality of life after phase II cardiac rehabilitation in post coronary artery bypass graft surgery (CABG). **Material & Methods:** A Quasi experimental study was conducted Shifa international hospital (SIH) Islamabad from June 2017 to November 2017 (IRB#: 778-053-2017). The sample of n=30 participants (male = 15, female = 15), were collected through non-probability Convenient sampling method. Male and female participants between 45-60 years of age with coronary artery bypass graft surgery and completed phase I cardiac rehabilitation program were included in the study. To measure quality of life RAND 36-Item Health Survey was used at 0 week and after 8 week. **Results:** The mean age of study participants in female was 54.53±3.357 and male 55.60±5.20 years. The results showed that there post intervention significant improvement was observed in male than female regarding physical functioning (33.33±4.98 vs. 70±41.40, $p=0.028$). Role limitation due to physical health also showed more improvement in male than female (MD=21.66). Role limitation due to emotional showed significant improve in females than male (26.66±45.77 vs. 80±41.40, $p=0.002$). **Conclusion:** The study indicated that 8 week phase II cardiac rehabilitation programs had significant role in improving all domains of Quality of life (SF-36). But physical function, role limitation due to physical health and role limitation due to emotional problem were more improved in male as compare to female.

Keywords: Cardiac rehabilitation, CABG, quality of life, gender

INTRODUCTION

Cardio vascular diseases are one of the major diseases that caused morbidity and mortality all around the world.¹ According to rough estimate 17 million people die of heart diseases globally in a year. However in Pakistan mortality rate due to cardiovascular diseases are 455 male and 388 female deaths per 100,000 people.²

In Conroy artery disease (CAD), complications such as worsening of psychosocial function may be expected, because patients have to face the challenges of a new life phase that can be accompanied by physical and mental deterioration.³ One of the main reasons to offer cardiac surgery is to improve both survival and quality of life. Coronary artery bypass graft (CABG) has been shown to be cost-effective at 5 years compared to medical therapy, and compared to percutaneous coronary intervention in multi-vessel CAD.⁴

The physical, psychological, spiritual, and social well-being is important components of quality of life of the client, which are affected greatly by cardiovascular diseases.⁵ Quality of life in Coronary artery disease (CAD), affects not only the physical performance but the

psychological and social behavior of these patients as well. Gender based differences have also a significant impact on quality of life due to differences in biology, psychology and social roles.⁷ Women show slower return to physical, leisure and social activities than men. On the other hand men reports earlier recovery. The women who are lower on quality of life issues may suggest that their needs are not being met.⁸ Cardiac rehabilitation program has been proven to improve physical performance, decrease depression and increase quality of life.⁹ The benefits of CR on exercise ability and on risk-factor modification are equally as good for women as for men of while controlling confounding factors.⁸ Phase II starts after completion of Phase I cardiac rehabilitation program in early hospital stay that includes, care of chest (incision site), improve lung compliance and exercise which improve daily living activities, patient and family education and changes in life style.¹⁰ Phase II of cardiac rehabilitation is conducted in outpatient clinic focus on Increasing overall strength and aerobic capacity, exertion level (RPE) and self-monitoring of heart rate (HR) are the physical goals we want to achieve. The patient

comes for monitored exercise and the rehab team keeps a close watch on how the exercises affect heart. Under the supervision of physical therapist, there is progressive increase in exercises.^{10,11}

In Pakistan, there is significant diversity in male and female regarding psychosocial roles and responsibilities as compare to developed countries like America, UK etc. It may affect CR II response as they are receiving in outpatient department as compare to in patient Phase I CR. The purpose of the study was to determine the gender based differences in quality of life after phase II cardiac rehabilitation in post CABG patients.

MATERIAL & METHODS

A Quasi experimental study was conducted Shifa international hospital (SIH) Islamabad from June 2017 to November 2017 after receiving approval from the Ethical Committee (IRB#: 778-053-2017). The sample of n=30 participants (male= 15, female= 15), undergoing cardiac surgery and follow-up in rehabilitation OPD of SIH, were collected through non-probability Convenient sampling method. (Figure 1)

Figure 1: CONSORT diagram

Male and female participants between 45-60 years of age with coronary artery bypass graft surgery and completed phase I cardiac rehabilitation program were included in the study. Participant having communication disorder that could not be overcome with an interpreter, stroke and other neurological disorders and smokers were excluded from the study. The intervention protocol for male and female were incorporated for 8 weeks. The detail of protocol can be seen in table 1.

The data was collected through General Demographic Performa, comprised of age, height, weight, BMI, history of diabetes etc. to measure

quality of life RAND 36-Item Health Survey (Version 1.0) was used at 0 week and after 8 week.

After checking the normality of data parametric tests were applied. The frequency, percentages, mean±SD, mean difference and p-value was used for descriptive statistics. Although the data was not normally distributed but for within group analysis paired t-test was used, as mean and median of SF-36 was not clinically different. To determine the difference in quality of life between groups, before and after 8 week intervention, independent t- test and mean difference was used. SPSS V. 21 was used to analyze the data.

Table 1: Phase II Cardiac Rehabilitation Protocol for Protocol male and female participants

	Flexibility/warmup (Daily)	Aerobics (Daily)	Strength (bi-weekly)
Type of Exercises	<ul style="list-style-type: none"> Stretching of cervical, upper back, calf and hamstring muscles, Shoulder shrugging and shoulder rotation was performed actively 	<ul style="list-style-type: none"> Treadmill exercise Recumbent bike, Exercises 	<ul style="list-style-type: none"> Strength training (weights for arm exercise, elastic bands, quadriceps bench)
Frequency	<ul style="list-style-type: none"> Stretching: 30 sec, 3-5 repetitions/session Warm-up: 15-20 repetition 	<ul style="list-style-type: none"> 11-13 repetition/session 2 to 3 sets for every type of exercise 	<ul style="list-style-type: none"> 10-12 repetition/session. 2 to 3 sets for every type of exercise
Intensity	<ul style="list-style-type: none"> Stretching: According to patient comfort 	<ul style="list-style-type: none"> Slow to moderate pace. Avoid becoming short of breath. 	<ul style="list-style-type: none"> Effort which was not forceful, pain free. Weight in pounds: 3 to 5 Progress accordingly
Duration (30-60 Minutes)	<ul style="list-style-type: none"> 15 min./session for 8 week 	<ul style="list-style-type: none"> 1st week: 5 to 10 minutes 2nd week: 11 to 15 minutes 3rd week: 16 to 20 minutes 4th week: 20 minutes 5th week: 25 minutes 6th week: 30 minutes 7th week: 35 minutes 8th week: 36 to 40 	<ul style="list-style-type: none"> 15 min./session for 8 week

RESULTS

The mean age of study participants in female was 54.53 ± 3.357 and male 55.60 ± 5.20 years. The mean BMI in female and male was 24.34 ± 2.78 and

23.01 ± 3.21 respectively, in both groups. Equal patients i-e; 11 male and 11 female had diabetes while 4 male and 4 females were non-diabetic. (Figure 2)

Figure 2: Diabetes distribution in males and females

Within group analysis showed that both female and male significantly improved ($p \leq 0.05$) in all domains of quality of life (SF-36) except in female participants physical function did not improve significantly (18 ± 26.37 versus 33.33 ± 44.98 , $p = 0.063$) after 8th weeks of phase II cardiac rehabilitation. (Table 2)

The results showed that there post intervention significant improvement was observed in physical functioning of males than female (33.33 ± 4.98 versus

70 ± 41.40 , $p = 0.028$). Role limitation due to physical health did not showed any statistically significant difference in female and male participants (50 ± 49.09 versus 71.66 ± 43.16 , $p = 0.210$), but while looking effect size (MD=21.66) male were improve more as compare to female. Role limitation due to emotional showed significant improve in females than male (26.66 ± 45.77 versus 80 ± 41.40 , $p = 0.002$). The MD of energy/fatigue level, emotional wellbeing, social functions, pain and general health,

at baseline and after 8 weeks of phase II cardiac rehabilitation, did not show any clinically significant

difference in means of females and males. (Table 3)

Table 2: With-in group Analysis QOL (SF-36)

		Female				Male			
		Mean	SD	MD	p-value	Mean	SD	MD	p-value
Physical functioning	Pre	18	26.37	-15.33	.063	33	27.89	-37	<0.001**
	Post	33.33	44.98			70	41.40		
Role limitation due to physical functioning	Pre	0	0	-50	.001*	0	0	-71.66	<0.001**
	Post	50	49.09			71.66	43.16		
Role limitation due to emotional problem	Pre	0	0	-26.66	.041*	0	0	-80	<0.001**
	Post	26.66	45.77			80	41.40		
Energy/fatigue	Pre	46.66	17.33	-29.166	<0.001**	63.33	16.68	-26.66	<0.001**
	Post	75.83	13.74			90	14.33		
Emotional well being	Pre	38.83	17.59	-20.83	<0.001**	60.33	16.76	-22.5	<0.001**
	Post	59.66	17.90			82.83	16.76		
Social function	Pre	82.93	3.19	-13.33	<0.001**	82.40	2.94	-13.33	<0.001**
	Post	96.26	4.13			95.73	4.13		
Pain	Pre	32.66	16.13	-23.66	<0.001**	59.33	12.65	-24	<0.001**
	Post	56.33	17.97			83.33	15.31		
General health	Pre	38	20.68	-25	<0.001**	59.66	19.12	-26	<0.001**
	Post	63	22.26			85.66	17.09		

**Level of significance: <0.001

* Level of significance : <0.05

Table 3: Between group analysis

		Female		Male		MD	p-value
		Mean	SD	Mean	SD		
Physical functioning	Pre	18	26.37	33	27.89	-15	0.141
	Post	33.33	44.98	70	41.40	-36.67	0.028*
Role limitation due to physical functioning	Pre	0	0	0	0	0	NA
	Post	50	49.09	71.66	43.16	-21.66	0.210
Role limitation due to emotional problem	Pre	0	0	0	0	0	NA
	Post	26.66	45.77	80	41.40	-53.34	0.002
Energy/fatigue	Pre	46.66	17.33	63.33	16.68	-16.67	0.012*
	Post	75.83	13.74	90	14.33	-14.17	0.010*
Emotional well being	Pre	38.83	17.59	60.33	16.76	-21.5	0.002*
	Post	59.66	17.90	82.83	16.76	-23.17	<0.001**
Social function	Pre	82.93	3.19	82.40	2.94	0.53	0.638
	Post	96.26	4.13	95.73	4.13	0.53	0.726
Pain	Pre	32.66	16.13	59.33	12.65	-26.67	<0.001**
	Post	56.33	17.97	83.33	15.31	-27	<0.001**
General health	Pre	38	20.68	59.66	19.12	-21.66	<0.001**
	Post	63	22.26	85.66	17.09	-22.66	<0.001**

**Level of significance: <0.001

* Level of significance: <0.05

DISCUSSION

The objective of the study was to determine gender based differences in quality of life (QOL) in patients with coronary artery bypass graft (CABG) after phase II cardiac rehabilitation (CR). The results showed that all domain of Quality of life (SF-36) significantly improve in female participants except physical

functioning and male participants significantly improve in all domains. The results also showed that male participants significantly improvement in physical function, role limitation due to physical health and role limitation due emotional health than female participants.

Cardiac rehabilitation helps patients to come back in normal life after surgery. However it is seen that

outcomes of the cardiac rehabilitation phase II is different for male and females. Researches support that cardiac rehabilitation improves quality of life both in male and female. A study conducted to evaluate the effectiveness of Cardiac Rehabilitation Care Plan on Quality of Life of Patients Undergoing Coronary Artery Bypass Graft Surgery, showed increased quality of life after 13 sessions in male and female post cardiac rehabilitation phase II.¹² A similar study done by Alexander et al. also portrayed the same results after 12 week sessions of cardiac rehabilitation phase II on both the genders.¹³ A study conducted by Muller-Nor horn et al. also showed significantly improved quality of life of male and female patients after cardiac rehabilitation following the open heart surgery.¹⁴ In 2002, Lindsay et al. performed a study on 183 patients who had had bypass surgery and SF36 questionnaire was used to measure the impact of cardiac rehabilitation after bypass surgery for both male and female group. The results showed that after completing cardiac rehabilitation programs with major factor of education, a marked difference was observed between both groups in terms of role limitation due to physical functioning; general health, social functioning, and physical health.¹⁵

Male group showed better results than the female group which is in accordance with a similar study that showed less improvement in women in terms of physical functioning and activities than the male patients. It was seen in the domain of role limitation of emotional problems that p-value between both groups is insignificant as the researches also show that females are more depressed and show more anxiety than males.¹⁶ In the domain of fatigue/energy it was seen that female patients had more fatigue/energy issues in the beginning of the study than the male patients as starting mean value of females was 29 and of males was 63. Whereas after the completion of the study mean was 52.67 in females and 87 in males. Hence the extent of betterment was more in males than females as the p value between groups was 0.00. Studies also showed that women are easily fatigued as compared to male after rehabilitation.¹⁷

It has been seen in the domain of social function and general health that there was a prominent difference in the results of both groups as in the domain of pain too. However the mean pre score of male patients is higher than that of females but the

extent of betterment in terms of score was not same in both groups. The p-value was 0.00 which shows there was significant difference in the results of both male and female groups. Literature review supports males patients significantly improved in social functioning and general health than females post cardiac rehabilitation phase II.¹⁸ Literature reviews also suggest that postoperative and procedural pain was more severe among women than men.¹⁹

Moreover the male patients in our social environment have active lifestyle and in some cases patients have to go back to normal lifestyle as early as possible. On the other hand the female patients have comparatively less pressure of going back to normal life so therefore they progress slowly. In the overall analysis women showed slow and less recovery in the activities of daily livings than males in phase II but general mental and health status improved. Physical functioning in female also not significantly improved. The possible reason is that in our study housewives are included as they are less likely to go outside the house.

As there is lack of information about contributing/confounding factors in relation gender, that may affect QoL must be included in future studies with larger sample to determine the impact of phase II cardiac rehabilitation. It is also suggested that multi-disciplinary team approach was missing in current study, that may positively affect both male and female regarding their Quality of Life must be incorporated in future study.

The sample of the study was 30 which is also very small, therefore further studies with large sample size and on larger scale with more controlled environment is required in order to obtain more refined results.

CONCLUSION

The study indicated that 8 week phase II cardiac rehabilitation programs had significant role in improving all domains of Quality of life (SF-36). But physical function, role limitation due to physical health and role limitation due to emotional problem were more improved in male as compare to female.

REFERENCES

1. Mc Namara K, Alzubaidi H, Jackson JK. Cardiovascular disease as a leading cause of death: how are pharmacists getting involved?. *Integr Pharm Res Pract.* 2019;8:1–11.

2. Russell S, Sturua L, Li C, Morgan J, Topuridze M, Blanton C, et al. The burden of non-communicable diseases and their related risk factors in the country of Georgia, 2015. *BMC Public Health*. 2019;19(3):479.
3. Opić P, Roos-Hesselink JW, Cuypers JAAC, Witsenburg M, van den Bosch A, van Domburg RT, et al. Longitudinal development of psychopathology and subjective health status in CHD adults: a 30- to 43-year follow-up in a unique cohort. *Cardiol Young*. 2015;26(3):547-55.
4. Perrotti A, Ecarnot F, Monaco F, Dorigo E, Monteleone P, Besch G, et al. Quality of life 10 years after cardiac surgery in adults: a long-term follow-up study. *Health Qual Life Outcomes*. 2019;17(1):88.
5. Oliveira AJ, Lopes CS, Rostila M, Werneck GL, Griep RH, Leon AC, et al. Gender differences in social support and leisure-time physical activity. *Rev Saude Publica*. 2014;48(4):602-12.
6. Srivastava S, Shekhar S, Bhatia MS, Dwivedi S. Quality of Life in Patients with Coronary Artery Disease and Panic Disorder: A Comparative Study. *Oman Med J*. 2017;32(1):20-6.
7. Ngun TC, Ghahramani N, Sánchez FJ, Bocklandt S, Vilain E. The genetics of sex differences in brain and behavior. *Front Neuroendocrinol*. 2011;32(2):227-46.
8. Mithal A, Bansal B, Kyer CS, Ebeling P. The Asia-Pacific Regional Audit-Epidemiology, Costs, and Burden of Osteoporosis in India 2013: A report of International Osteoporosis Foundation. *Indian J Endocrinol Metab*. 2014;18(4):449-54.
9. Servey JT, Stephens M. Cardiac Rehabilitation: Improving Function and Reducing Risk. *Am Fam Physician*. 2016;94(1):37-43.
10. Stewart KJ, Badenhop D, Brubaker PH, Keteyian SJ, King M. Cardiac rehabilitation following percutaneous revascularization, heart transplant, heart valve surgery, and for chronic heart failure. *Chest*. 2003;123(6):2104-11.
11. Parks D, Allison M, Doughty R, Cunningham L, Ellis CJ. An audit of phase II cardiac rehabilitation at Auckland hospital. *N Z Med J*. 2000;113(1109):158-61.
12. Masoumi SZ, kazemi f, Khani S, Seifpanahi-Shabani H, Garousian M, Ghabeshi M, et al. Evaluating the Effect of Cardiac Rehabilitation Care Plan on Quality of Life of Patients Undergoing Coronary Artery Bypass Graft Surgery. *Int J Cardiovasc Pract*; Vol 2, No 2 (2017)DO - 1021859/ijcp-020204. 2017.
13. Alexander JL, Wagner CL. How cardiac rehabilitation relates to quality of life. *Rehab Nurs*. 2006;31(4):155-7.
14. Müller-Nordhorn J, Kulig M, Binting S, Völler H, Gohlke H, Linde K, et al. Change in quality of life in the year following cardiac rehabilitation. *Qual Life Res*. 2004;13(2):399-410.
15. Lindsay GM, Hanlon W, Smith LN, Belcher P. Experience of cardiac rehabilitation after coronary artery surgery: effects on health and risk factors. *Int J Cardiol*. 2003;87(1):67-73.
16. Izawa KP, Oka K, Watanabe S, Yokoyama H, Hiraki K, Morio Y, et al. Gender-related differences in clinical characteristics and physiological and psychosocial outcomes of Japanese patients at entry into phase II cardiac rehabilitation. *J Rehabil Med*. 2008;40(3):225-30.
17. Michielsen HJ, De Vries J, Van Heck GL. Psychometric qualities of a brief self-rated fatigue measure: The Fatigue Assessment Scale. *J Psychosom Res*. 2003;54(4):345-52.
18. Oberai S. Review study of health related quality of life (HRQL) among coronary artery disease patients after cardiac surgery. *Indian J Occup Ther*. 2014;46(1).
19. Fillingim RB, King CD, Ribeiro-Dasilva MC, Rahim-Williams B, Riley III JL. Sex, gender, and pain: a review of recent clinical and experimental findings. *J Pain*. 2009;10(5):447-85.

Disclaimer: None to declare.

Conflict of Interest: None to declare.

Funding Sources: None to declare.