

Investigating the effect of collaborative care on depression, anxiety, and stress of patients after coronary angioplasty

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ARTICLE INFO

ABSTRACT

Article history:

Received: 28 July 2016

Revised: 06 September 2016

Accepted: 10 September 2016

Key words:

Collaborative care model

Stress

Anxiety

Depression

Coronary angioplasty

Background: Coronary artery disease and its associated treatment interventions such as angioplasty can lead to emotional problems, including depression, anxiety, and stress, in patients and might have adverse effects on the recovery process. This study aimed to evaluate the effect of collaborative care model on depression, anxiety, and stress in patients after coronary angioplasty.

Methods: This clinical trial was conducted on 50 patients undergoing coronary angioplasty, who were referred to intensive care unit and surgical ward of one of the hospitals of Isfahan, Iran, in 2015. Samples were selected through randomized convenience sampling and were divided into intervention and control group (n=25 for each group). Collaborative care model, consisting of four stages of motivation, preparation, engagement, and evaluation, was implemented for the intervention group through five 45-60 minute sessions and a three-month telephone follow-up. Data was collected using depression, anxiety, and stress scale (DASS-42) before and one month after the intervention from both groups. Data were analyzed using descriptive statistics, Chi-square, as well as independent and paired t-tests in SPSS, version 18.

Results: In this study, mean score of depression was significantly decreased in the intervention group after the implementation of collaborative model (from 31.6 ± 3.7 to 6.3 ± 5.03) ($P < 0.001$), and mean anxiety and stress scores were reduced from 32.6 ± 3.04 and 32.2 ± 3.3 to 6.2 ± 4.1 and 8.5 ± 4.8 , respectively ($P < 0.001$). In this regard, a significant difference was observed between the intervention and control groups ($P < 0.001$).

Conclusion: Implementation of collaborative care could be associated with lower depression, anxiety, and stress in patients after coronary angioplasty. Therefore, its application is recommended as an effective method for such patients.

1. Introduction

Cardiovascular diseases, which are considered a global epidemic, are the leading causes of death in adults.¹ Coronary artery disease is the most important form of cardiovascular diseases, which is responsible for a considerable number of deaths in the world and in Iran.² This disease is responsible for 46% of the mortality in Iran and its incidence is 181.4 people in 100,000.^{3, 4} Regarding this, treatment, control, and management of these diseases are very important, which require different therapeutic approaches, including invasive and noninvasive procedures.⁵

Among invasive procedures, coronary angioplasty is more financial and less risky, which has been welcomed by many patients.⁶ Due to the low risk and high success rate of this method, about 400,000 angioplasties are annually performed only in the United States of America.⁷ The high prevalence of this disease in Iran increases the demand for therapeutic interventions such as angioplasty.⁸

Angioplasty reduces or relieves symptoms and improves the patient's condition by widening the narrowed artery. However, this procedure may impose some changes to lifestyle or enhance stress, anxiety, and depression in the patients.⁹ Evidence

suggests that following angioplasty and coronary artery bypass graft surgery, the majority of the patients suffer from mental illness, depression, and anxiety; furthermore, the fear of returning to work and normal life intensifies their concerns.^{10, 11} Ebadi et al. (2011) reported that since angioplasty is a minimally invasive procedure, health providers assume that angioplasty patients experience less depression and anxiety and thereby require less care and education.¹²

Although pharmacological methods are used to reduce the adverse psychological effects in cardiac patients, these methods can cause some side effects.¹³ This point doubles the necessity for the use of non-pharmacological methods. After coronary angioplasty, the patients should be under control and supervision of the healthcare team.¹⁴

Engaging the patients in the treatment programs and decision-making process can be effective in delivering better health services.¹⁵ Several studies have shown that collaborative care improves stress, anxiety, and depression in different patients.¹⁶⁻²⁰ For instance, in a study conducted by Coventry et al. (2014), collaborative care was introduced as an agent to reduce depression in patients with chronic diseases.¹⁶ Furthermore, Beach et al. (2014) concluded that collaborative care can improve the quality of care and decrease mental disorders.¹⁷ Likewise, Vandervoort et al. (2015) stated that collaborative care reduces symptoms of depression.¹⁸

Nursing models present appropriate guidelines for promotion of quality of care. Regarding this, the use of a model which fits the society's culture is recommended.¹¹ Collaborative care model is a culture based model developed by Mohamed et al. (2001) to control high blood pressure.²¹ This model, which entails four stages, namely motivation, preparation, engagement, and evaluation is presented by the healthcare team using the necessary trainings.²² In this model, the nature of the collaborative role of patients and healthcare team is beyond their individual role. Moreover, in this model, the quality and the type of relationship between the presenter and the receiver of healthcare service is very important.²³ As a result, this model develops an effective therapeutic relationship between a patient, a nurse, and a physician.²⁴ Some studies have shown that this model can have a positive impact on mental health of patients.^{11, 13}

Coronary artery disease influences all physical, psychological, and social aspects of life. Depression, stress, and anxiety in the patients with this disease are largely due to physical problems and reduced quality of life.²⁵ Given this, patient participation in program development and their consensus on treatment programs are important. This study aimed

to evaluate the impact of implementing collaborative care model on depression, anxiety, and stress in patients after coronary angioplasty.

2. Methods

2.1. Design

This study was a randomized clinical trial, conducted on two groups, using pre-test and post-test. The study population included patients undergoing coronary angioplasty surgery hospitalized in intensive care, internal, and surgical units in a hospital in Isfahan, Iran, in 2015.

2.2. Participants and setting

In this study, Following Hessampoor and colleagues' study (2014),²⁶ the sample size was calculated to be 25 people in each of the intervention and control groups with a confidence interval of 95%, statistical power of %80, and possibility of 10% attrition ($Z_1=1.96$, $Z_2=0.84$, $d=0.8$). Patients, meeting the inclusion criteria, were selected through randomized convenience sampling and were assigned into intervention and control groups, using the table of random numbers.

The inclusion criteria were as follows: 1) having undergone coronary angioplasty, 2) having appropriate clinical conditions based on doctor's opinion, 3) having an age range of 18-70 years, 4) being alerted and having the ability to communicate, 5) being aware of the disease, 6) having the ability to read and write, and 7) not having other diseases such as diabetes, hormonal disorders, kidney disease, and acute cardiovascular disease, such as secondary hypertension and chronic mental illnesses.

All information on the eligibility of the patients was obtained by interviewing the patients and reviewing their medical records. The exclusion criteria included the absence of more than two sessions of training and any problems that prevented the patient from continuing to participate in the study.

2.3. Instruments

For the purpose of data collection, this study utilized the form of demographic characteristics and Depression, Anxiety, and Stress Scale (DASS-42), developed by Lovibond and Lovibond in 1995.²⁷ The demographic characteristics form included information such as age, sex, educational status, employment status, income level, history of angioplasty, drug addiction, and body mass index.

DASS-42 is a self-report scale, which consists of 42 questions evaluating depression, anxiety, and

stress simultaneously. Each of the three parts of depression, stress, and anxiety has 14 questions, which are scored by summing up the score of each item.²⁸ In this questionnaire, each item is rated on a 4-point Likert scale (0=did not apply to me at all, to 3=applied to me very much or most of the time). In the depression subscale, points are leveled as normal (0-9), mild (10-13), medium (14-20), severe (21-27), and very severe (more than 28). In the anxiety subscale, points are leveled as normal (0-7), mild (8-9), medium (10-14), severe (15-19), and very severe (more than 20). And in terms of stress subscale, they were graded as normal (0-14), mild (15-18), medium (19-25), severe (26-33), and very severe (more than 34).²⁹ The validity of this scale is confirmed in a study by Afzali *et al.* (2007). Its reliability was estimated to be 0.91, 0.84, and 0.84 for the subscales of depression, anxiety, and stress, respectively, using Cronbach's alpha. Moreover, Cronbach's alpha for all the items were reported to be 0.96 and 0.95 in the non-clinical and clinical samples, respectively.²⁸ Musarezaie *et al.* (2013) obtained correlation coefficients of 0.975, 0.947, and 0.9000 for depression, anxiety, and stress, respectively.³⁰ In the present study, the reliability of the entire questionnaire was estimated to be 0.959, using Cronbach's alpha.

2.4. Data Collection

Demographic characteristics form and DASS-42 questionnaire were completed in a self-administered way in the pre-test stage.

In the intervention group, the collaborative care program was held based on health partnership program in five sessions in the hall of the hospital, using group work. The first three sessions of collaborative care training were held within three weeks (one session a week, lasted 45-60 min) with the presence of the patients, nurse (researcher), cardiologist, and a member of the patient's family (Table 1). The educational content was initially developed by the researcher based on authentic texts and original resources.^{31, 32}

After receiving the professors' confirmation, the educational content was raised in the collaborative sessions with the presence of the doctor and the patients; thereafter, the collaborative care program was finalized with the participants' individual

agreement. After three sessions of training, collaborative care was pursued in two sessions within two weeks, which was arranged through researcher's follow-up and making phone calls. These sessions were held with the aim of sustaining care programs and patient involvement. The content of these sessions consisted of final evaluation of the program with regard to the objectives, giving behavioral feedback to patients, and acknowledging their participation and agreement.

After holding collaborative care sessions, the participants' questions were answered through the follow-up phone calls based on the prior agreement by the end of the twelfth week. A month after the end of the intervention, patients participating in the intervention and control groups were asked to refer to the hospital for taking post-test and filling in the DASS-42 questionnaire. During the study, the control group were under the usual training. After the study, for this group, two panel discussion sessions were held on the importance of medication regimen, diet, and exercise.

2.5. Ethical considerations

After explaining the purpose of the study and obtaining the consent and cooperation of officials of the research context, the researcher performed sampling. Subsequently, the study objectives were explained to each patient individually and they were assured that participation in the study is completely voluntary. The researcher was available during the study and the questions were answered. In addition, the participants' informed consent to participate in the study was obtained.

2.6. Statistical analysis

Data analysis was performed, using descriptive statistics (mean and standard deviation), Chi-square tests (to compare the two groups in terms of sex, educational status, employment status, income level, angioplasty, and drug addiction), independent t-test (to compare the two groups in terms of body mass index, age, depression, anxiety, and stress), and paired t-test (for within-group comparison of each group before and after intervention in terms of depression, anxiety, and stress) through SPSS version 18.

Table 1. Educational content of the collaborative care model

Session	Content
First (motivation)	A needs assessment was conducted in terms of understanding the patients' problems, building familiarization with the disease, current conditions, threats, and complications of disease, presenting information on diet, proper physical activity, and correct drug use in patients with coronary artery disease, and patient empowerment, enquiring the participants' views, providing educational booklets.
Second (preparation)	A discussion took place by the participation of the patients, doctor, and nurse (researcher) to determine the nature of training sessions and follow-ups, duration of each session, the sessions' objectives, and content of the training program
Third (engagement)	Training program on proper diet, proper physical activity, and the importance of the taken medicine and how to use them were provided, using individual nurse and patient discussions. The patients expressed their views, which were then discussed. After the doctor's visit and reaching a consensus, the therapeutic regimen program was finalized and prepared to be applied. At the end of this session, patients were expected to reach an acceptable level of knowledge, attitude, and performance to participate in the care and treatment process.

3. Results

Demographic characteristics of the participants are illustrated in Table 1. As can be seen, no significant statistical differences were observed between the variables in the intervention and control groups. Likewise, independent t-test showed no significant difference between mean scores of depression, anxiety, and stress between the two

groups before the intervention. Nevertheless, after the implementation of collaborative care model, mean score of depression ($P < 0.001$), anxiety ($P < 0.001$), and stress ($P < 0.001$) significantly decreased in the intervention group. This difference was statistically significant, compared to the control group ($P < 0.001$) (Table 2).

Table 2. Demographic characteristics of the participants

Group	Variables	Intervention	Control	P
		N %	N %	
Gender	Female	2 (8)	2 (8)	1*
	Male	23 (92)	23 (92)	
Educational status	Primary school	7 (28)	7 (28)	0.29*
	Middle school	2 (8)	6 (24)	
	High school	12 (48)	10 (40)	
	University	4 (16)	2 (8)	
Employment status	Employee	1 (4)	2 (8)	0.53*
	Housewife/househusb	1 (4)	0	
	Retired	10 (40)	7 (28)	
	Worker	5 (20)	4 (16)	
	Self-employed	8 (32)	12 (48)	
Income level	Weak	8 (32)	11 (44)	0.38*
	Average	17 (68)	14 (56)	
History of angioplasty	With history	5 (20)	4 (16)	0.5*
	Without history	20 (80)	21 (84)	
History of drug use	Cigarette	2 (8)	4 (16)	0.35*
	Opiates	1 (4)	0	
	Alcohol	1 (4)	0	
BMI	M±SD	3.5±26.1	1.7±26	0.88**
Age (years)	M±SD	8.1±54.2	7.6±55.1	0.44**

*Chi-square statistical test **Independent t-test

Table 3. Mean score of depression, anxiety, and stress before and after intervention in the intervention and control groups

Group Variables	Intervention		Control		*P	
	Before intervention	After intervention	Before intervention	After intervention		
	M±SD	M±SD	M±SD	M±SD		
Depression **P	3.7±31.6	<0.001	5.03±6.3	2.8±31.9	0.54	<0.001
Anxiety **P	3.04±32.6	<0.001	4.1±6.2	2.1±32.7	0.26	<0.001
Stress **P	3.3±32.2	<0.001	4.8±8.5	2.7±31.3	0.85	<0.001

*Independent t-test **Paired t-test

4. Discussion

The results of this study showed that collaborative care model could help reduce

depression, anxiety, and stress in patients after coronary artery angioplasty. Similarly, in a study conducted by Coventry *et al.* (2014), the use of collaborative care was shown to reduce depression

and improve self-management in patients with chronic diseases and mental health problems.¹⁶ In addition, a study carried out by Beach *et al.* (2014) revealed that collaborative care leads to further participation of physicians and healthcare team in the treatment process, improves the care quality, and reduces the mental disorders.¹⁷ Vandervoort *et al.* (2015) reported that collaborative care can have a positive impact on patients' quality of life and performance and reduce symptoms of depression.¹⁸ In a report by Sighinolfi *et al.* (2014), collaborative care was indicated to reduce depression and improve treatment progress more than usual care.¹⁹ Meyer *et al.* (2014) reported that with the presence of the nurse, psychologist, and cardiologist, collaborative care had more positive impacts on depression after coronary artery bypass graft surgery, compared to drug therapy.²⁰ Moreover, Cerimele *et al.* (2015) concluded that performing collaborative care in the onset of treatment for patients with bipolar disorder reduces symptoms and also improves their performance.³³

Investigating the effect of collaborative care model, Borhani *et al.* (2012) showed that the local model could improve quality of life in terms of mental health in patients with heart failure.¹¹ In addition, Parviniannasab *et al.* (2013) introduced collaborative care model as a suitable method to reduce depression level in adolescents with beta-thalassemia major.³⁴

As can be seen, the results of the mentioned studies are consistent with the results of the current study. However, what distinguished this study from other similar studies were the agreement between doctors, nurses, and patients on therapeutic regimen (diet, drug regimen, and exercise program), performing follow-ups, and the presence of a member of the patient's family in therapy sessions (to evaluate the continuity of the effect of collaborative care on patients' depression, anxiety, and stress).

These group sessions not only enables the participants to share each other's capabilities and benefit from each other's skills, but also helps them to form social networks with other members of the group. Therefore, patients' participation in self-care behaviors and their disease acceptance can lead to discovering the best way of adaptation to disease, which may be the cause of mental health improvement in these patients.³⁵

Unlike the results of this study, the study of Wetherell *et al.* (2013) showed that collaborative care could not reduce patient anxiety.³⁶ Similarly, Hudson *et al.* (2016) stated that collaborative care

intervention has no effect on the improvement of patient depression.³⁷ This discrepancy between results of this study and those of the mentioned studies maybe due to the difference in study population and sample size. In addition, the implementation of collaborative care can have a significant impact on the results of the study. The role of culture also should be taken into account as it has a huge impact on the implementation of care models in diverse communities.¹¹

The main limitations of this study included small sample size and short-term follow-up of patients; however, the researchers tried to do the most phone call follow-ups in this short time.

5. Conclusion

Based on the results of this study, the collaborative care model can improve depression, anxiety, and stress in patients after coronary artery angioplasty. Given the prevalence of mental health problems in these patients, it is recommended that this simple and inexpensive approach be used to educate patients undergoing coronary angioplasty.

Conflicts of interest

The authors declare no conflicts of interest.

Authors' contributions

Parastoo Rezapour: Study design, holding training sessions, data collection, preparation of preliminary draft of the article. Mohsen Shahriari: Cooperation in study design, implementation guidance, data analysis, participation in the drafting of article. Mahin Moini: Cooperation in study design, consulting project implementation, participation in the drafting of article. Hamid Sanei: Project consultant, participation in holding training sessions

Acknowledgments

The present study was derived from a postgraduate thesis in nursing which was sponsored by Isfahan University of Medical Sciences and registered under the code of ethics IR.mui.rec.1394.3.174 in the center for clinical trial of the Ministry of Health under the code IRCT2015120120912N. Hereby, the researchers express their gratitude to all the patients participating in this study as well as to officials and personnel of Shahid Chamran Hospital, Isfahan, Iran who helped in conducting this study.

References

1. Quan H, Chen G, Walker RL, Wielgosz A, Dai S, Tu K, et al. Incidence, cardiovascular complications and mortality of hypertension by sex and ethnicity. *Heart* 2013; 15; 99(10):715-21.
2. Tofighi S, Ahmad Kiadaliri A, Sadeghifar J, Raadabadi M, Mamikhani J. Health-related quality of life among patients with coronary artery disease: a post-treatment follow-up study in Iran. *Cardiology research and practice* 2012; 2012: 1-6.
3. Boroumand S, Shahriari M, Abbasi Jebeli M, Baghersad Z, Baradaranfard F, Ahmadpoori F. Determine the level of self-efficacy and its related factors in patients with ischemic heart disease: a descriptive correlational study. *Iranian Journal of Nursing Research* 2015; 9(35): 61-9. [Persian]
4. Koochi F, Salehiniya H, Mohammadian-Hafshejani A. Trends in mortality from cardiovascular disease in Iran from 2006-2010. *Bimonthly Journal of Sabzevar University of Medical Sciences* 2015; 22(4): 630-38.
5. Oliveira Carvalho AL, Hueb W, Gersh BJ, Lima EG, Favarato D, Rezende PC, et al. Quality of life in patients with multivessel coronary artery disease: ten-year follow-up of a comparison of surgical, angioplasty or medical strategies-MASS II trial. *Journal of Clinical Trials* 2014; 4(2): 1-7.
6. Blankenship JC, Marshall JJ, Pinto DS, Lange RA, Bates ER, Holper EM, et al. Effect of percutaneous coronary intervention on quality of life: a consensus statement from the Society for Cardiovascular Angiography and Interventions. *Catheterization and Cardiovascular Interventions* 2013; 81(2): 243-59.
7. Kim MJ, Jeon DS, Gwon HC, Kim SJ, Chang K, Kim HS, et al. Health-related quality-of-life after percutaneous coronary intervention in patients with UA/NSTEMI and STEMI: the Korean multicenter registry. *Journal of Korean medical science* 2013; 28(6): 848-54.
8. Moafi S, Zolaktaf V, Rabiei K, Hashemi M, Tarmah H. Effects of home-based exercise rehabilitation on quality of life after coronary artery bypass graft and PCI early postdischarge. *Zahedan journal of research in medical sciences (ZJRMS)* 2011; 13(6): 25-30. [Persian]
9. Schumacher HC, Meyers PM, Higashida RT, Derdeyn CP, Lavine SD, Nesbit GM, et al. Reporting Standards for Angioplasty and Stent-Assisted Angioplasty for Intracranial Atherosclerosis. *Journal of Vascular and Interventional Radiology* 2009; 20(7): S451-S473.
10. Huffman JC, Celano CM, Januzzi JL. The relationship between depression, anxiety, and cardiovascular outcomes in patients with acute coronary syndromes. *Neuropsychiatric Disease and Treatment* 2010;6(123-36): 11123-36.
11. Borhani F, Khoshab H, Abbaszadeh A, Rashidinejad H, Mohammadi E. Study of the effect of partnership care model on the quality of life in patients with heart failure. *Journal of Critical Care Nursing* 2012; 5(1):43-8.
12. Ebadi A, Moradian ST, Feyzi F, Asiabi M. Comparison of the hospital anxiety and depression among patients with coronary artery disease based on proposed treatment. *Journal of Critical Care Nursing* 2011; 15; 4(2): 97-102.
13. Khoshab, H, Bagheryan, B, Abbaszadeh A, Mohammadi E, Kohan S, Samareh Rad H. The effect of collaborative care model on depression and anxiety in the patient with heart failure. *Journal of Evidence-based Care* 2012; 2(2): 37-46. [Persian]
14. Peterson JC, Allegrante JP, Pirraglia PA, Robbins L, Lane KP, Boschert KA, Charlson ME. Living with heart disease after angioplasty: a qualitative study of patients who have been successful or unsuccessful in multiple behavior change. *Heart & Lung: The Journal of Acute and Critical Care* 2010; 39(2): 105-15.
15. Dobscha SK, Corson K, Perrin NA, Hanson GC, Leibowitz RQ, Doak MN, et al. Collaborative care for chronic pain in primary care: a cluster randomized trial. *Jama* 2009; 301(12): 1242-52.
16. Coventry P, Lovell K, Dickens C, Bower P, Chew-Graham C, McElvenny D, et al. Integrated primary care for patients with mental and physical multimorbidity: cluster randomised controlled trial of collaborative care for patients with depression comorbid with diabetes or cardiovascular disease. *Bmj* 2015; 350: h638.
17. Beach SR, Walker J, Celano CM, Mastromauro CA, Sharpe M, Huffman JC. Implementing collaborative care programs for psychiatric disorders in medical settings: a practical guide. *Gen Hospital Psychiatry* 2015; 37(6): 522-27.
18. Van Der Voort TY, Van Meijel B, Hoogendoorn AW, Goossens PJ, Beekman AT, Kupka RW. Collaborative care for patients with bipolar disorder: Effects on functioning and quality of life. *Journal of affective disorders* 2015; 179(1): 14-22.
19. Sighinolfi C, Nespeca C, Menchetti M, Levantesi P, Murri MB, Berardi D. Collaborative care for depression in European countries: a systematic review and meta-analysis. *Journal of psychosomatic research* 2014; 77(4): 247-63.
20. Meyer T, Belnap BH, Herrmann-Lingen C, He F, Mazumdar S, Rollman BL. Benefits of collaborative care for post-CABG depression are not related to adjustments in antidepressant pharmacotherapy. *Journal of psychosomatic research* 2014; 76(1): 28-33.
21. Azadi F, Mohammadi E. Evaluation of partnership care model on quality of life in patients with coronary disease. *Iranian Journal Of Nursing Research* 2007;1(2):23-9. [Persian]
22. Shariati A, Latifi M, MajdiNasab N, Abad M, Abad AC. Collaborative Care Model effect on Multiple Sclerosis (MS) patients' lifestyle. *Jundishapur Journal of Chronic Disease Care* 2013; 2(3): 47-56.
23. Alamdarlou A, Hosseini MA, Khankeh H, Norouzi K, Soltani PR, Mozakki SH. The effect of collaborative care model on sleep quality of patients undergoing coronary artery bypass graft surgery. *Iranian Journal of Rehabilitation Research in Nursing* 2015; 1(4): 1-14. [Persian]
24. Alijani-Renany H, Tamaddoni A, Haghighy-Zadeh MH, Pourhosein S. The effect of using partnership care model on the quality of life in the school age children with B-thalassemia. *Journal of shahrekord university of medical science* 2012; 14(1): 41-49. [Persian]
25. Suman-Horduna I, Roy D, Frasure-Smith N, Talajic M, Lespérance F, Blondeau L, et al. Quality of life and functional capacity in patients with atrial fibrillation and congestive heart failure. *Journal of the American College of Cardiology* 2013; 61(4): 455-60.
26. Dehghan Hesampur M, Shahriari M, Pahlavanzadeh S, Hazini A. The effects of relaxation on quality of life in elderly with cancer at Isfahan Saiedo Shohada hospital in 2014. *Isfahan: Isfahan University of Medical Sciences*; 2014. 87. [persian]
27. Lovibond PF, Lovibond SH. The structure of negative emotional states: Comparison of the depression anxiety stress scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour research and therapy* 1995; 33(3): 335-43.
28. Afzali A, Delavar A, Borjali A, Mirzamani A. Psychometric properties DASS-42 test of a sample of high school students in the city of Kermanshah. *Journal of Research in Behavioural Sciences* 2007; 5(2): 81-92.
29. Kashani F. The effect of relaxation and massage therapy on depression, anxiety and stress in woman under went mastectomy referred to Sayed Alshohada hospital in Isfahan in 2010. *Isfahan: Isfahan University of Medical Sciences*; 2010. 287. [persian]
30. Musarezai A, Naji Esfahani H, Momeni Ghaleghasemi T, Karimian J, Ebrahimi A. The Relationship between Spiritual Wellbeing and Stress, Anxiety, and Depression in Patients with Breast Cancer. *Journal of Isfahan Medical School* 2012; 30(195): 1-10.
31. Khorasani P, Nazari F. Healthy life style. *Isfahan: Isfahan University of Medical Sciences*; 2010. [persian]
32. Garyani MA. *Cardiovascular Medicines*. Mashhad: Mashhad University of Medical Sciences; 2011. [persian]
33. Cerimele JM, Ratzliff A, Sexton JM. Collaborative care for a patient with bipolar disorder in primary care: a case example. *General hospital psychiatry* 2015; 37(2): 144-6.

34. parviniannasab A, rosta S, vejvani M, dehghani A, keshkar Z, anshorshori N, et al . The Effects of the Group Reminiscence on Cognitive Status of Mild Cognitive Impaired Elders. *Iranian Journal of Psychiatric Nursing (Ijpn)* 2014; 1 (4):25-35. [Persian]
35. Rabeipour S, Ordoni Avval Z, Arefi M, Behroozilak T. The effectiveness of group counseling by collaborative approaches on specific stress in infertile women. *Journal of Urmia Nursing and Midwifery Faculty* 2016; 14(1): 56-65. [Persian]
36. Wetherell JL, Petkus AJ, Thorp SR, Stein MB, Chavira DA, Campbell-Sills L, et al. Age differences in treatment response to a collaborative care intervention for anxiety disorders. *The British Journal of Psychiatry* 2013; 203(1): 65-72.
37. Hudson JL Hudson JL, Bower P, Archer J, Coventry PA. Does collaborative care improve social functioning in adults with depression? The application of the WHO ICF framework and meta-analysis of outcomes. *Journal of affective disorders* 2016; 189: 379-91.

How to cite: Rezapour P, Shahriari M, Moieni M, Sanei H. Investigating the effect of collaborative care on depression, anxiety, and stress of patients after coronary angioplasty. *Medical-Surgical Nursing Journal*, 2016; 5(2): 51-57.