The Effectiveness of Improving Body Awareness Skills on Anxiety, Depression, and Quality of Life in Patients after Cardiac Surgery

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Quantitative Study

Abstract

Background: Anxiety and depression are prevalent in patients who have undergone cardiac surgery, both of which affect the quality of life (QOL). Undesirable QOL is associated with the exacerbation of disease severity. This study was conducted with the aim to assess the effect of body awareness improvement on QOL, anxiety, and depression among patients after cardiac surgery.

Methods: This randomized, clinical trial was performed with intervention and control groups (two groups with three measurements). All patients who had undergone cardiac surgery in hospitals in Qazvin, Iran, during 2018-2019 comprised the statistical population of this study. After convenience sampling (50 patients with cardiac disease at least 1 month after their surgery), patients were randomly assigned to experimental and control groups (25 individuals each). The measurement tools used were the Depression, Anxiety, Stress Scales (DASS-42) and MacNew QOL Questionnaire. Body awareness training was implemented twice a week for 6 weeks. Data were analyzed using analysis of variance (ANOVA) in SPSS software.

Results: The study results showed that improving body awareness can reduce anxiety and depression, and enhance QOL significantly in patients after cardiac surgery (P < 0.01).

Conclusion: The results showed that improving body awareness can effectively reduce anxiety and depression and enhance QOL in patients after cardiac surgery.

Keywords: Body awareness; Anxiety; Depression; Quality of life; Cardiac patients; Bioenergy economy

Introduction

Coronary artery disease (CAD) accounts for 28% of total deaths around the world. There is evidence indicating that the prevalence of the condition is on the rise in Iran (Hadaegh, Harati, Ghanbarian, & Azizi, 2009), and it is considered to be the cause of approximately 50% of all deaths per annum (Hatmi, Tahvildari, Gafarzadeh, & Sabouri, 2007). As predicted by the World Health Organization (WHO), cardiovascular disease (CVD) was the leading cause of mortality in 2015, with a mortality rate of more than 20 million individuals (Bhupathy, Haines, & Leinwand, 2010). As announced by the Centers for Disease Control and Prevention (CDC) (2005), the prevalence of coronary heart disease (CHD) is 5.5% higher in men compared to women.

However, a study on people aged 30 years and older in Tehran, Iran, reported that CHD was more prevalent in women than in men (22.3% versus 18.8%). After a heart attack and cardiac surgery, most patients have mental illness, depression, and anxiety, and their concerns are exacerbated by job loss and fear of returning to work and ordinary life (Homayoni & Khosropanah, 2005). Moreover, when the individual experiences stress, discomfort, or anxiety, the mind sends a message to the body to reduce energy consumption in order to deal with the disease, which increases the vulnerability to disease (Alipor, Aliakbari Dehkordi, Hasanzadeh Pashang, Faraji, 2016).

Anxiety is one of the most prevalent mental disorders in human societies and stressful life events, in particular long-term problems such as some physical diseases, can be the cause of its incidence and continuation (Nazemian, Ghafari, & Poorghaznein, 2008). Anxiety and stress have always been the most common symbiont with humans and are as old as human history. Anxiety is an emotional state characterized by developing a state of disquiet and concern (Mohammad Aliha, Ghani dehkordi, Ganji, Hoseini, 2010). Problems such as pain, limited physical activity, anxiety, fatigue, and sleep problems are prevalent in heart patients and cause a reduction in quality of life (QOL) in these patients.

Anxiety in a patient with chronic disease results from the several factors including medical, psychological, and social factors. Anxiety experienced by heart patients is partly due to diagnosis and treatment, followed by poor health and impaired roles and communications (Mohammad Aliha et al., 2010). Anxiety and depression increase the risk of CVD recurrence after a heart attack, both of which are predictors of death and recurrence of coronary events. Anxiety is prevalent in patients after a heart attack and can persist for months after this event. Depression and anxiety affect heart rate, blood pressure, clotting time, and blood coagulation, increase the secretion of cortisol and adrenaline, and disrupt the metabolism of the body (Mohammad Aliha et al., 2010).

In 2012, a meta-analysis on the timing of depression showed that depression both before and after acute cardiac stress was a predictor of mortality and exacerbation of heart disease. The onset of depression during the 30 days after an acute cardiac event is strongly correlated with heart disease and mortality. The cardiovascular system is also sensitive to changes occurring in the environment or one's emotional states such as anxiety, fear, anger, happiness and instant excitement, and depression, and undergoes changes in heart rate, heart rhythm, and overall cardiac output. The increasing prevalence of cardiac surgery necessitates paying greater attention to such patients and determining their postoperative QOL.

Healthcare providers have generally realized that physical aspects alone cannot be considered in the treatment of patients. Different aspects of patients' lives should be taken into consideration to help them achieve a healthy life. Over the past 20 years, there has been a dramatically increasing interest in evaluating daily performance and improving QOL in patients with chronic diseases, in particular heart disease. Clinical trials have demonstrated that QOL can be considered as an indicator of health care quality and part of the treatment plan, and its measurement in chronic diseases is a useful guide for the improvement of care quality (Rahnavard, Zolfaghari, Kazemnejad, & Hatamipour, 2006).

QOL is determined based on an individual's perception of his/her life situation in

relation to cultural factors, goals, ideas, and beliefs. QOL is influenced by factors that make life worthwhile and create positive experiences, with different meanings for different people. An individual's QOL is a personal opinion determined by the individual (Park & Park, 2002). Health-related QOL is a reflection of disease and treatment consequences according to patients' views and experiences (Hofer, Benzer, Schussler, von, & Oldridge, 2003). Undesirable QOL is associated with exacerbation of disease severity, lower survival rate, elevated hospitalization days, and declined functional activities in heart patients (Hofer et al., 2003; Havik et al., 2007).

Body awareness and improvement of its related skills are among the abilities needed to manage daily stress and improve QOL, and thus, reduce anxiety and depression. Training body awareness is effective on both the prevention and treatment of pain (Gard, 2005). In this method, appropriate exercises and conscious breathing are used in fully relaxed conditions, including light, soothing sounds and minimized verbal concentration, in order to pay attention to different body senses and the link between different parts of the body (Catalan-Matamoros, Helvik-Skjaerven, Labajos-Manzanares, Martinez-de-Salazar-Arboleas, & Sanchez-Guerrero, 2011).

According to the literature, training patients on body awareness, paying attention to it using relaxation techniques, and coordinating the mind and body can reduce anxiety and depression. Since no study has been conducted in Iran on training heart patients on the promotion of body awareness and given the importance of this issue, the present research was conducted to investigate the effectiveness of promoting body awareness skills on anxiety, depression, and QOL among patients after cardiac surgery in Bu Ali Hospital, Qazvin, Iran.

Methods

This randomized clinical trial was conducted with an applied research design and a control group. All postoperative patients in the cardiac surgery ward of hospitals in Qazvin from February 2018 to May 2019 comprised the statistical population of this study. In this study, 50 male and female heart disease patients were randomly selected from a total of 96 patients at least 1 month after surgery through convenience sampling (due to the limited number of surgical patients) and were randomly divided into experimental and control groups (each with 25 individuals). The experimental group participants took part in body awareness training 2 hours a week for 6 weeks. The participants of both control and experimental groups took part in the pretest, posttest, and 2-month follow-up. The inclusion criteria were cardiac surgery patients, willingness to participate in the research, informed consent, full awareness, the necessary ability to participate in the study, and 18-65 years of age. The exclusion criteria included a history of mental disorders based on DSM-5 diagnostic criteria excluding depressive disorder, the use of narcotics and stimulants, and the death of close relatives over the past 3 months. The data collection tools used in this study were the Depression, Anxiety, Stress Scales (DASS-42) and MacNew QOL questionnaire. The content of the intervention sessions is provided in table 1.

Table 1. The content of intervention sessions

Sessions	Content
1	Introduction, general explanation of the training used in the sessions, deep breathing exercises, and playing music for body relaxation
2	Physical examination exercise, sitting vibration exercises, opening and closing the body, and daily exercises
3	Daily exercise feedback, pelvic relaxation exercise, contension exercise, daily exercise
4	Attention and body awareness training, conscious touch of hands and standing vibration exercises training
5	Physical examination exercise, pelvic relaxation exercise in different modes, con-tension training, daily exercises
6	Group gathering and individual presentation of feedback on feelings after the exercises to the whole group, followed by a farewell

The current study followed the Declaration of Helsinki on Biomedical Research Involving Human Subjects and was approved by the Ethics Committee of Isfahan University of Medical Sciences (code: 1398.211). All participants provided written informed consent for participation in the study.

The Depression, Anxiety, Stress Scale: The DASS-42 was developed by Lavibund (1995). The short form of this scale contains 21 questions and has been translated and validated in Iran (Sahebi, Asghari, & Salari, 2005). This questionnaire consists of 3 scales designed to measure negative emotional states in depression, anxiety, and stress. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia and inertia. The anxiety scale includes autonomic arousal, effects of muscular muscles, situational anxiety, and mental experience of anxiety. The stress scale determines non-specific chronic arousal levels; it consists of the subscales of problems in calmness, nervous arousal, becoming upset or anxious easily, becoming irritable or restless easily, and being impatient.

Questions Were scored on a 4-point Likert scale, which indicate an increase in the level of exposure to the experience in the past week. Depression, anxiety, and stress scores were calculated based on the total score of questions in each scale. The short form (21-item form) of this questionnaire includes 7 items in each scale, and the score of each scale is calculated with a factor of 2. The 21-item questionnaire has a high internal reliability (α = 0.93) in the depression (α = 0.88), anxiety (α = 0.82), and stress (α = 0.90) scales. The 21-item questionnaire was translated into Persian and validated by Sahebi et al., who approved the reliability of the depression (α = 0.77), anxiety (α = 0.79), and stress (α = 0.78) scales of the Persian version of this questionnaire.

The MacNew Heart Disease Health-Related Quality of Life Questionnaire: The MacNew QOL questionnaire was developed by Valenti, Lim, Heller, and Knapp (1996) and validated by Jafari and Yousefi (2005) in Iran. This questionnaire, which is for heart patients, is a valuable tool for measuring and evaluating the QOL in cardiovascular patients. It was designed to assess the impact of heart disease, particularly CHD, and its treatment on the physical, emotional, and social activities of patients. The questionnaire is sensitive to changes in health-related QOL following medical intervention for heart patients. This questionnaire consists of 27 questions, with an average time of 10 minutes to answer the questions. The questions are divided into the 3 areas of emotional functioning (14 questions), physical functioning (14 questions with 5 questions assessing chest pain symptoms, dyspnea, fatigue, dizziness, and leg pain), and social functioning (13 questions).

The questions are distributed in the questionnaire in a way that each question can cover 1, 2, or 3 domains. The score of each domain is obtained by calculating the average score in that domain, and the final score for QOL is obtained by averaging all the questions. This questionnaire has acceptable validity and reliability compared with other HRQOL assessment tools (Hofer et al., 2003). It was adjusted for heart patients in Isfahan Province, Iran, with a reported reliability of 0.94 based on Cronbach's alpha coefficient (Jafari & Yousefi, 2005).

Table 2. Results from the descriptive study of demographic variables in the experimental and control groups

Variables	Experimental n(%)	Control n(%)	P-value
Gender			0.519
Female	7 (0.35)	9 (0.45)	
Male	13 (0.65)	11 (0.55)	
Total	20 (1. 00)	20 (1. 00)	
	Mean ± SD	**Mean ± SD**	
Age	60.60 ± 8.48	61.70 ± 8.19	0.679

SD: Standard deviation

Table 3. Results of the descriptive study of the quality of life variable in the experimental and control groups before and after the intervention and at follow-up

	Measurement stages	Experimental group	Control group
		Mean ± SD	Mean ± SD
Physical functioning	Before the intervention	51.55 ± 7.33	50.85 ± 9.71
	After the intervention	62.90 ± 7.95	51.20 ± 7.09
	Follow-up	61.00 ± 8.72	47.05 ± 8.71
Social functioning	Before the intervention	55.50 ± 8.12	54.75 ± 10.77
	After the intervention	68.05 ± 8.92	55.15 ± 8.20
	Follow-up	67.00 ± 9.48	51.45 ± 10.01
Emotional functioning	Before the intervention	61.20 ± 7.72	59.00 ± 11.34
	After the intervention	73.50 ± 9.33	60.40 ± 9.42
	Follow-up	71.40 ± 11.10	55.35 ± 10.10
Quality of life	Before the intervention	116.50 ± 14.63	113.20 ± 21.26
	After the intervention	141.60 ± 17.99	115.10 ± 16.75
	Follow-up	137.05 ± 20.42	106.30 ± 19.08

SD: Standard deviation

The participants of both experimental and control groups underwent pretest, posttest, and 2-month followed-up. In this research, descriptive indicators (mean and standard deviation) and inferential statistics [repeated measures analysis of variance (ANOVA)] were used to compare the pretest, posttest, and follow-up data, and normality of variables was examined. The data analysis was conducted using the per-protocol approach. All statistical analyses were conducted using SPSS software (version 15; SPSS Inc., Chicago, IL, USA). P-value < 0.05 was considered as significant.

Results

Demographic data (age and gender) did not significantly differ between the two groups (P-value > 0.05) (Table 2).

Results of the descriptive study of the QOL variable and its dimensions in the experimental and control groups in the pretest, posttest, and follow-up are provided in table 3.

Mauchly's test was used to examine the sphericity of the covariance matrix; the sphericity hypothesis was rejected based on the value of the obtained Sig. (Table 4). Due to the rejection of the sphericity hypothesis, the F statistic was obtained using the adjusted degrees of freedom.

The results presented in table 5 show that the results of ANOVA are significant with effect factors of 0.479 and 0.261 for the group and time, respectively (P < 0.01), which rejects the assumption of similarity of mean observations at different stages; in other words, it indicates changes in the average QOL at different measurement stages. This means that the QOL of patients (control and experimental groups) is affected over time as a result of improving body awareness skills.

Table 4. Sphericity test of the covariance matrix for the quality of life variable

Internal effect	Mauchly's test	X^2	df	P	ε		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Intervention	0.83	6.57	2	0.037	0.860	0.921	0.500

df: Degree of freedom

Table 5. Results of repeated measures analysis of variance

Variable	Source	SS	df	MS	F	P-value	Eta coefficient
QOL	Group	12221.008	1	12221.008	34.902	> 0.001	0.479
	Error	13305.783	38	350.152			
	Time	2713.537	1	2713.537	13.455	0.001	0.261
	Error	7663.792	38	201.679			
	Group × time	598.504	1	598.504	2.968	0.093	0.073

SS: Sum of squares; df: Degree of freedom; MS: Mean of squares

Results of the descriptive study of depression and anxiety in the experimental and control groups in the pretest, posttest, and follow-up stages are presented in table 6.

Mauchly's test was used to examine the sphericity of the covariance matrix; the sphericity hypothesis was confirmed based on the value of Sig. (Table 7). Hence the sphericity hypothesis was not rejected.

Table 8 shows that the results of ANOVA are significant with effect factors of 0.150 and 0.168 for the group and time, respectively, ($p < 0.01$) for depression. Moreover, they were significant with effect factors of 0.135 and 0.116 for the group and time, respectively, ($p < 0.01$) for anxiety. These reject the assumption of similarity of mean observations at different stages and indicate changes in depression and anxiety at different measurement stages. This means that the depression and anxiety of patients (control and experimental groups) are affected over time as a result of improving body awareness skills.

Discussion

Considering the increasing number of heart patients who are at high risk of heart consequences due to their high anxiety, this study sought to determine the factors that reduce the risks which threaten these patients. Body awareness and improvement of its related skills are among the skills needed to manage daily stress, and thus, reduce anxiety and depression, and improve QOL. Body awareness training is effective on both the prevention and treatment of pain.

The present study results showed that the QOL of patients (control and experimental groups) is influenced over time as a result of improving body awareness skills. The experimental group showed an increasing trend from the pretest to posttest, followed by a decrease until the follow-up stage. In all 3 stages, the mean QOL score of the experimental group was higher than that of the control group. In Finland, Jarvinen, Saarinen, Julkunen, Huhtala, and Tarkka (2003) reported that although QOL in patients with underlying diseases was lower than that in non-affected patients before and after cardiac surgery, improvement in QOL after 1 year was similar to that of non-affected patients, which is in line with the present study. The improvement of body awareness skills influenced depression and anxiety among patients in the control and experimental groups over time. In the experimental group, there was a decreasing trend from the pretest stage to the posttest stage, and then an increasing trend to the follow-up stage. In

Table 6. Results of the descriptive study of depression and anxiety in the experimental and control groups in the pretest, posttest, and follow-up

	Measurement stages	Experimental group	Control group
		Mean ± SD	Mean ± SD
Depression	Pretest	8.50 ± 4.77	9.80 ± 4.25
	Posttest	5.70 ± 4.07	8.10 ± 5.18
	Follow-up	7.95 ± 4.07	10.60 ± 5.18
Anxiety	Pretest	9.55 ± 3.96	9.90 ± 5.21
	Posttest	6.65 ± 4.14	8.50 ± 4.35
	Follow-up	7.85 ± 3.93	11.25 ± 5.66

SD: Standard deviation

Table 7. Sphericity test for the covariance matrix of the Depression, Anxiety, Stress Scales score

Internal effect	Mauchly's statistic	X²	df	P	Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Intervention	0.83	6.57	2	0.037	0.860	0.921	0.500

df: Degree of freedom

all 3 stages, the mean depression and anxiety scores of the experimental group were higher than that of the control group. It has previously been shown that 40-50% of patients suffer from depression and anxiety several months after cardiac surgery (Spiegel et al., 1999; Mussgay & Ruddel, 2004).

Moreover, Kaviani, Hatami, and Shafieabadi (2009) found that mindfulness-based cognitive therapy (MBCT) reduced anxiety and depression levels.

Similarly, previous studies (Neff, 2003; Roth & Robbins, 2004; Mace, 2008; Bohlmeijer, Prenger, Taal, & Cuijpers, 2010) presented evidence that mindfulness therapy can help in adjusting negative behaviors and thoughts, inducing positive health-related behaviors, increasing one's attention to and awareness of physical and mental feelings, and teaching people to deal with negative emotions and thoughts and to experience positive mental events. It seems that body awareness training has desirable impacts, similar to those of mindfulness, on depression and anxiety in patients after cardiac surgery.

Relaxation techniques are among the complementary methods for the treatment of anxiety, which have been shown to mitigate anxiety and cause a mild to moderate reduction in depression in patients with chronic diseases. Active or progressive muscle relaxation (PMR) is a method which creates deep relaxation, and thus, reduces anxiety through active contraction and relaxing certain muscle groups in a progressive state. The mechanism of effect of PMR on depression is not known, but an existing hypothesis is that PMR reduces depression and improves QOL through the reduction of anxiety (Lolak, Connors, Sheridan, & Wise, 2008). A study by Davidson (2003) also showed that meditation and relaxation increase the activity of the left frontal lobe of the brain, which is an indicator of anxiety. In this regard, Bastani, Hidarnia, Kazemnejad, Vafaei, & Kashanian (2005) studied the effect of PMR on the reduction of anxiety in pregnant women and found that relaxation improved mental health and reduced anxiety. Relaxation seems to reduce anxiety through neuropsychological and psychological systems (Hudetz, Hudetz, & Reddy, 2004).

Furthermore, Ghielen et al. (2015) showed that integrated body awareness intervention, combination of physical therapy principles with acceptance and commitment therapy (ACT), can be utilized to teach patients to deal with wearing-off related anxiety (WRA). The study by Ghielen, et al. showed that this new intervention, named BEWARE, will be more effective than the usual treatment in increasing self-efficacy.

Table 8. Results of repeated measures analysis of variance

Variable	Source	SS	df	MS	F	P-value	Eta coefficient
Depression	Group	134.408	1	134.408	6.704	0.014	0.150
	Error	761.850	38	20.049			
	Time	142.604	1	142.604	7.686	0.009	0.168
	Error	705.025	38	18.553			
	Group × time	1.204	1	1.204	0.065	0.800	0.002
Anxiety	Group	104.533	1	104.533	5.942	0.020	0.135
	Error	668.500	38	17.592			
	Time	113.438	1	113.438	4.979	0.032	0.116
	Error	865.725	38	22.782			
	Group × time	0.004	1	0.004	0.000	0.989	0.001

SS: Sum of squares; df: Degree of freedom; MS: Mean of squares

Conclusion

This study showed that improving body awareness can effectively reduce anxiety and depression and enhance QOL in patients after cardiac surgery.

Research limitations and recommendations: Due to the limited number of hospitalized patients and typically short hospitalization duration, a limited number of participants were available for this study, and the control group received no interventions. It is recommended that in future studies the method used in the present study be compared with other treatment methods by considering more variables.

Conflict of Interests

Authors have no conflict of interests.

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