J Biochem Tech (2018) Special Issue (2): 126-130
ISSN: 0974-2328

Effect of Rhythmic Breathing on Anxiety in Patients with Unstable Angina Pectoris

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Received: 05 Junuary 2018 / Received in revised form: 29 Jun 2018, Accepted: 06 July 2018, Published online: 05 September 2018

Abstract

Background and aim: An unstable angina pectoris is one of the most common types of cardiovascular diseases; although the disease can be medically managed, the patients are always exposed to physical, mental, and social stressors arising from it; therefore, they need nursing interventions including the use of patient's modern training techniques. Furthermore, self-care can be very helpful for patient care and treatment. Method: In this applied-experimental research, 56 patients with unstable angina pectoris who referred to the admission wards of Firoozabadi Hospital in the city of Shahr-e Rey, Iran, were selected using convenience sampling and were randomly assigned to one of the two control (n = 28) and intervention (n = 28) groups. Subjects in the intervention group received face-to-face and rhythmic breathing training after 2 hours of admission and the acute phase of the disease. Data collection tools included two questionnaires of demographic information and Spielberger's State Anxiety Inventory. The questionnaires were completed before and after the intervention. Results: According to the findings, the use of rhythmic breathing training reduced the anxiety level in the intervention group, which had a long- lasting and significant effect (p> 0.05). Conclusion: Since the use of supportive interventions for rhythmic breathing can reduce anxiety level in the patients with unstable angina pectoris, it is recommended that the nursing managers of health centers take the results of this research into consideration in nursing care programs as an effective way to reduce the anxiety of these patients.

Keywords: Training, Rhythmic Breathing, Anxiety, Unstable Angina Pectoris.

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Introduction

Cardiovascular diseases are the leading global cause of mortality and the major contributor to the public health problems (Mirbagher Ajorpaz & Kafaei Atrian, 2014). 17.7 million people die every year from cardiovascular diseases (Rubinstein et al., 2010). The disease is caused by the emerging phenomenon of community renewal, recent advancements in technology and increased population density in all countries of the world, so that according to the WHO, the number of CVD deaths is expected to reach 23.6 million by 2030 (Alwan et al., 2011; Mathers & Loncar, 2006). In the Middle East, including Iran, cardiovascular disease stands a major health and social problem, and has become one of the main causes of mortality and disability, accounting for 45% of all deaths. According to the World Health Organization (2008), the CVD mortality rate in both men and women in Iran is 769 cases per 100,000 people (Nemati Sogolitappeh et al., 2009). Ischemic heart disease are one of the leading causes of death in adults older than 35 years; unstable angina diseases are the most dangerous ones (Shidfar et al., 2004). Angina or chest pain is a key clinical symptom in patients with ischemic heart disease (Canto et al., 2000). Chest pain, which is relieved by rest or usual angina medications like nitroglycerin, is called stable angina pectoris (Wee, Burns & Bett, 2009). However, unstable angina pectoris is caused by a temporary reduction in blood flow to the main arteries of the hearts muscle, and in most cases, these patients are admitted to the coronary care unit (Kumar & Cannon, 2009). Therefore, unstable angina now accounts for more than half of the admissions in the cardiac care unit (Shidfar et al., 2004). Most of these patients experience multiple physical and psychological symptoms which stress and anxiety are the most frequent ones (Aminian et al., 2014). Numerous studies have shown that 50% of patients admitted to the cardiac care unit experience stress and anxiety (Aminian et al., 2014; Arab et al., 2016) due to hospitalization, fear of death, heart surgery and generally fear of unknown factors (Woods, 2010). Stress and

anxiety cause physiological responses such as increased respiration, heart rate, blood pressure, myocardial oxygen consumption and plasma concentrations of epinephrine and norepinephrine leading to exacerbation of the disease, coronary artery thrombosis, increased risk of arrhythmias, cardiac events, and ultimately death (Arab et al., 2016; Shibeshi, Young-Xu & Blatt, 2007; Bradt & Dileo, 2009). Patients with anxiety are four to six times more likely to experience fatal cardiovascular disease events than other patients (Ebadi et al., 2011) and less anxiety with more survival chance (Ciric-Zdravkovic et al., 2014). However, many patients may experience anxiety and its complications up to 2 years following the cardiovascular events (Huffman, Celano & Januzzi, 2010). In addition, stress and anxiety can increase the length of hospital stay and medical expenses leading to impaired personal performance, poor general health, and low life satisfaction (Ghasemi et al., 2013). Therefore, management of stress and anxiety in patients with unstable angina should be treated at a high priority level in treatment measurements and since non-pharmacological methods are associated with less complications and better compatibility, they should be considered as a line first treatment for these patients. Rhythmic breathing is one of the stress and anxiety management techniques, which has received increasing attention from researchers in recent years. Further, it is one of the distraction techniques, which provides a strategy for increasing oxygen intake in the patients (Mohammadpour, Basiri & Saber, 2016). The main objective of this technique is to shift the focus from stimulants, which may make the symptoms of stress and anxiety worse and thereby reduce the severity of fear, stress and anxiety (Borzou et al., 2014). Furthermore, rhythmic breathing reduces levels of the body's stress hormones, such as adrenaline and cortisol (Sharma et al., 2015). Theoretically, rhythmic breathing reduces perceived anxiety and stress levels by increasing the function of parasympathetic system through the vagus nerve and enhancing the inhibitory effect on GABA receptors in brain pathways that are critical to understanding fear, emotional regulation, and stress response. Meanwhile, it increases the prolactin and oxytocin release promoting a feeling of calmness and relaxation and improves the baroreflex sensitivity and the thalamic function (Brown & Gerbarg, 2005). According to the results of the study by Vedamurthachar et al. (2011), the application of rhythmic breathing technique reducs the levels of anxiety and stress in diabetic patients than their nondiabetic counterparts. Similarly, Jyotsna et al. (2013) found that rhythmic breathing reduces the sympathetic system function and increases the parasympathetic system function, which could be attributed to the decreased stress and anxiety levels and the risk of cardiovascular disease in these patients (Sharma et al., 2015). In another study by Parsiecta et al. (2016), it was reported that the Benson's relaxation and rhythmic breathing techniques could reduce postoperative anxiety in patients after the mastectomy surgery (Yekta et al., 2017). Since the rhythmic breathing is a simple, low-cost and non-invasive technique, and the nurse has necessary good communication skills to utilize this technique for unstable angina patients, this study aimed to determine the effect of rhythmic breathing on the anxiety of patients with unstable angina pectoris**.**

Method:

The present study was an experimental clinical trial with a control group. The patients with unstable angina, who met the inclusion criterion and earned a score higher than 20 from Spielberger inventory, were included in the study. The Spielberger's State Anxiety Inventory was completed by the patients before and one hour after the intervention. Patients were selected using convenience sampling method and were randomly assigned in one of the experimental and control groups. After admission to the CCU ward, the patients in the experimental group received routine treatments only for the first 2 hours. The rhythmic breathing technique was exercised after 2 hours and when the patient's condition remained unchanged (stable). Prior to the study, the rhythmic breathing method was individually and orally trained to the experimental group patients until the researcher ensured the patient’s mastery by exact observation. Training was done as follows: (i) Close your eyes, (ii) Place in the supine position, (iii) Breath slowly and regularly and uniformly (Inhale, exhale, relax) by counting to 3 , so that breath in the air from your nose and then breathe out slowly through your mouth. All the patients in the experimental group were trained to focus only on the entrance and exit of air in and out of the body during the respiration. After training, the patients in the experimental group were asked to practice the rhythmic breathing for 20 minutes every 5 minutes and once per 1 minute according to the training method (Mohammadpour, Basiri & Saber, 2016). Additionally, the patients received supplemental oxygen during an intervention if needed. The control group received only routine treatment. Rhythmic breathing was performed every 12 hours at 9 am and 9 pm (Yekta et al., 2017) for three days (Jyotsna et al., 2013) and under the supervision of a researcher.

Results

Table 1: Description of the sample’s demographic characteristics

Variable	Classes	Interventions	Control	
		percent	percent	
Sex	male	50.8	49.2	X^2=0.056 p=0.812
	female	48	52	
Marital status	single	33.3	66.7	X^2= 1.117 p=0.291
	married	51.9	48.1	
Blood pressure	No	58.1	41.9	X^2= 0.195 p=2.279
	No	41.9	58.1	
Triglyceride	Yes	48.4	51.6	X^2=0.050 p=0.999
	No	50.9	49.1	
Chest pain	Yes	56.5	43.5	X^2=0.534 p=0.627
	No	47.6	52.4	
Admission	Yes	57.7	42.3	X^2=0.882 p=0.842
	No	46.7	53.3	
Sedatives	Yes	50	50	X^2=0.001 p=0.999
	No	50	50	
Cardiovascular disease	Yes	51.9	48.1	X^2=0.054 p=0.979
	No	49.2	50.8	

Variable	Classes	Interventions	Control	
Admission for cardiovascular disease	Yes	59.1	40.9	X^2=0.977 p=0.459
	No	46.9	53.1	

Table 2: Descriptive indicators of the control and intervention groups in the pre-test and post-test for the general anxiety score

Group		pre-test	post-test
Control group	Number	28	28
	Mean	17.9	16.55
	Standard deviation	5.58	5.74
Intervention group	Number	28	28
	Mean	16.00	12.67
	Standard deviation	5.24	5.29

According to the results of Table 2, the sample size for both the control and intervention groups was 28. The mean of anxiety score in the control group was closely correlated to each other and there was no significant difference between the scores in both pre-test and post-test stages. However, after receiving training on rhythmic breathing, the mean of anxiety scores in the intervention group decreased approximately 3.05 points.

Table 3: Comparison of the mean of total anxiety scores between the control and intervention groups before and after the intervention

Variables	Experimental	Mean and standard deviation in control group	Mean and standard deviation in intervention group	Difference	Result
Anxiety	Before intervention	5.58±17.09	4.89±16.00	1.09	T=0.965 DF=54 P=0.337
	After the intervention	5.74±16.55	3.96±12.62	3.93	T=3.692 DF=54 P=0.0001

According to the results of independent t-test in Table 3, no significant difference was found between the mean scores of anxiety in the control and intervention groups before the intervention (P = 0.337). In addition, there was a significant increase in the mean scores of anxiety after the intervention in the intervention group (3.93) compared to the control group (P = 0.0001).

Table 4: Comparison of the mean total score of intra-group anxiety in the pre- and post-intervention stage

variables	Test	Before intervention	After intervention	Difference	Result
Anxiety	Control group	5.58± 17.09	5.74± 16.55	0.054	T =1.144, DF= 27, P = 0.157
	Intervention group	4.89 ±16.00	3.96 ±12.62	3.38	T =5.647, DF= 27, P =0. 0001

Based on paired T-test in Table 4, there was no significant difference between the mean scores of intra-group anxiety before and after the intervention (P = 0.157). Furthermore, a significant difference was found between the scores before and after the intervention in the intervention group and the mean anxiety score was decreased before the intervention (3.38) at a significant level of 0.01.

Research questions

First question: Does the use of rhythmic breathing techniques have any impact on the mean anxiety level of the intervention group compared to the control group?

To answer the above research question, the Repeated Measure ANOVA was used based on the administering the tests in three pre-test, post-test and follow-up steps. In addition, the sphericity assumption was evaluated and confirmed before the analysis of variance (P = 0.0001).

Table 5: The results of Repeated-measures analysis of variance (RM-ANOVA) for anxiety variable based on the three different times

Source	Sum of squares	Averages of squares	F ratio	Significance level	Eta-square
Time	261.133	130.667	271.114	0.001	0.224
Group - Time	189.054	94.527	19.615	0.001	0.189
Error	809.612	4.819			

According to the results of the above table, training of rhythmic breathing technique had a significant effect on reducing anxiety in patients with unstable angina pectoris. Therefore, the first question of research is confirmed and it can be concluded that rhythmic breathing can significantly decrease anxiety level among the subjects in the intervention group; the impact is long lasting and significant.

Discussion and Conclusion

Regarding the hypothesis of this study, the results showed a significant difference between the mean scores of anxiety in patients of both the control and intervention groups after the implementation of the rhythmic breathing training package. The results of the study by Dehghani et al. (2015) entitled as The effect of familiarization with cardiac surgery process on the

anxiety of patients undergoing coronary artery bypass graft surgery showed that the familiarization and training patients with heart surgery could reduce anxiety level of surgery process in the patients under study (Hosseini & Salehi, 2012). The results of another study by Kazemzadeh et al. (2004) entitled as The effect of individual and group self-care education on the patients with myocardial infarction, demonstrated that the lack of knowledge and awareness of patients is directly correlated with their anxiety levels; therefore, face-to-face training has led to anxiety reduction in these patients (Pan et al., 2013). These findings are consistent with those of Yeganeh Khah et al. (2014) who showed the positive impact of face-to-face training on anxiety in the patients with myocardial infarction (Shidfar et al., 2004). Similarly, Komatsu et al. (2012) examined the impact of self-care training on women with breast cancer, indicating that the application of face-to-face training, booklet and telephone follow-up is an effective and appropriate technique for coping with patients' anxiety (Hosseini & Salehi, 2012). The findings of the study by Nizaie et al. (2015) entitled as the relationship between social support and quality of life in patients with infarction also indicated that the psychological consequences of the disease have a devastating effect on life quality of the patients; therefore, the use of social support interventions is effective on the controlling the psychological consequences including anxiety and subsequently improves their quality of life (Januzzi et al., 2000).

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