Yoga after coronary artery bypass graft surgery: its effect on anxiety and self-care agency

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Abstract

Objectives: The aim of this study was to investigate the effect of yoga applied after coronary artery bypass graft surgery on anxiety and self-care agency of the patients.

Methods: A total of 30 patients aged between 40 and 78, who had participated in a yoga program following coronary artery bypass graft surgery, were included in the study. A yoga program, including breathing exercises, asanas, relaxation and meditation, was applied to the patients in a total of 24 sessions in the seated position on the chair twice a week.

The sociodemographic features of the patients were recorded. Patients' stress levels were assessedusing the STAI-I and STAI-II anxiety inventory, and the self-care agency was evaluated using the Exercises of Self-Care Agency-(ESCA) before and after the yoga program.

Results: The STAI-I and STAI-II scores of the patients were seen to decrease significantly after the yoga program compared to the scores obtained before the yoga program ($p<0.05$), and the ESCA scores were seen to increase ($p<0.05$).

Conclusion: It was concluded that yoga applied after coronary artery baypas graft surgery is a valuable source that aids realize the daily activities through reducing the anxiety levels by providing relaxation and increasing self- care agency.

Key words: Coronary artery bypass graft surgery, yoga, anxiety, self-care agency.

Introduction

Anxiety, a negative mood developing against perceived threats, may lead to medical and psychological outcomes when permanent or severe.[1] Anxiety has been shown to be an independent risk factor in development of cardiovascular diseases[1,2,3] and outcomes of cardiac surgery.[1,3,4] In previous studies, the patients have been reported to feel varying degrees of anxiety prior to, during, and after coronary artery bypass graft (CABG) surgery[1,4]. Although anxiety levels have been reported to decrease after surgery compared to preoperative period,[5] it was reported to continue mildly or moderately.[1,6]Moreover, it has been demonstrated that patients with high level of anxiety have difficulties in coping with the disease[7], the return of these patients to active life has been delayed,[8] and the quality of life has been affected.[1,7]

Self-care is the sum of the activities initiated and achieved by individuals to maintain health and wellness.[9] The ability to fulfil the individual's activities is defined as self-care agency. Having sufficient self-care agency is being able to meet the self-care needs adequately and sufficiently, taking the responsibility of self health, and not being dependent on others.[9,10] In this way, compliance with therapy improves and satisfaction with life increases by prevention of acute and chronic complications. The psychological status of the individual also affects the response to disease.[10] In the literature, early psychological management after cardiovascular surgery has been reported to aid patients in using effective coping strategies in their daily life.[3] Moreover, stress management has been recommended as a part of cardiac rehabilitation programs.[11,12] In this respect, yoga, which is a widely used body-mind therapy method in recent years may be beneficial for stress management and cardiac rehabilitation. Yoga is known to have psychological effects[2,13,14] besides beneficial physical effects in patients with chronic cardiovascular diseases through leading to a decrease in baroreceptor sensitivity and changes in heart rate through relaxation and meditation components.[2,13,15]

It is of great importance for patients to be able to maintain their lives by taking responsibility for their treatments and care. Thus, it is necessary to decrease the anxiety level and enhance self-care

agency. The aim of this study was to determine the patients' self-reported anxiety levels and self-care agency after CABG, and the effect of yoga on anxiety level and self-care agency.

Methods

The study included 30 patients in a private hospital in Turkey, who participated in and completed the yoga program applied in combination with the standard medical therapy one month after CABG. Before the initation of the study, approval from the ethics committe and the hospital was obtained. Informed consents were obtained from all the patients participating in the yoga program.

It was aimed to decrease the blood pressures and pulse rates of the patients with a yoga program applied one month after CABG surgery in the facility in which the study was conducted. The patients were also educated healthy nutrition during the yoga program.

The first interviews with the patients who were to participate in the yoga program were begun one month after CABG surgery. The socio-demographic characteristics were recorded through face-to-face interviews. The State-Trait Anxiety Inventory (STAI) and the Exercise of Self-Care Agency Scale (ESCA) were applied. The yoga program was applied twice a week for three months in a total of 24 sessions. Each session took one hour and included warming and breathing exercises (10 min), asanas (20 min), deep relaxation (15 min) and meditation (15 min) in the seated position on the chair. Asanas yoga was modified according to the clinical conditions of the patients. The yoga sessions were applied by a complementary medicine specialist who had completed her medical education on this topic and who was experienced in cardiac rehabilitation, and a yoga trainer who had received education in Vivekananda Yoga University in India. The STAI and ESCA were re-applied through face-to-face intervals to the patients who completed the yoga program. The patients were asked to make comments on the statements in the scales by themselves. Those not participating in the yoga program twice a week and not regularly participating in the yoga sessions were excluded from the study.

The socio-demographic data were obtained using the self-report questionnaire. The socio-demographic data included age (years), gender (male/female), years of education, current work-force status (in/out), and partner status (partnered/unpartnered).

The State-Trait Anxiety Inventory (STAI) [State (STAI-I) and Trait (STAI-II)]: STAI, which was developed by Spielberger et al., and the reliability and validity study, which was performed by Oner and Le Compte in the Turkish population, were used to determine the state and trait anxiety levels of the patients. STAI-I and STAI-II are likert-type instruments with 4 options, ranging from "never" to "completely". There are two types of statements in these instruments: direct statements expressing the negative feelings and reversed statements expressing the positive feelings. Answers for direct and reversed statements are tallied individually, and then the total of the answers for the reversed statements are deducted from the total of the answers for the direct statements. A predetermined constant (STAI-I (50) and STAI-II (35)) is added to this number. The final calculated value represents the individual's anxiety score. STAI-I is a very sensitive instrument in assessing the sudden changes in emotional reactions. STAI-II has 20 items addressing an individual's general anxiety level. The lowest possible score is 20 (low anxiety) and the highest possible score is 80 (high anxiety). [16] This scale which was applied to the patients before and after the yoga program was completed in 20 minutes.

The Exercise of Self-Care Agency Scale (ESCA): ESCA was developed by Kearney and Fleischer and adapted to Turkish by Nahcivan who performed the validity and reliability studies. The scale, which focuses on the self-assessment of the individual's self-care actions, is composed of 35 items. Each statement in this quintet likert type scale is scored between 0 to 4 (0=it does not describe me, 4=describes me very well). Eight statements are evaluated as negative and the scoring is reversed. The lowest possible score is 35 and the highest possible score is 140. The score reflects the health of the individual and the ability to maintain wellness.[17] This scale, which was applied to the patients before and after the yoga program, was completed in 10 minutes.

Data analysis: The statistical analyses were carried out using the SPSS package program, with a statistical significance level of $p<0.05$. Data were presented in percentages and averages. The

difference between the mean values was evaluated using the Paired Sample t-test and Mann-Whitney U test.

Results

Subject had a mean age of 59.4±10.9 (range, 40-78). Of the subject, 56.7% were females, 80% were married, 66.7% were graduates of college or above, and 56.7% worked in a full-time job.

There was no signficant difference between the anxiety levels and self-care agency scores according to the sociodemographic characteristics of the patients before and after the yoga program ($p>0.05$) (Table 1).

STAI-I, which measures the state anxiety, and STAI-II, which measures the trait anxiety, scores were also significantly decreased compared to the scores measured before the yoga program ($p<0.05$) (Table 2).

ESCA, which measures the patients' self-care agency, were significantly higher after 24 sessions of exercises compared to the score measured before the first session ($p<0.05$) (Table 2).

Table 1. Anxiety and self-care agency scores of the patients according to individual characteristics (N=30)

Parameters	Before sessions				After sessions		
	n	STAI-I	STAI-II	ESCA	STAI-I	STAI-II	ESCA
Age							
< 60	16	57.3±3.3	58.5±4.2	46.4±6.1	30.9±4.3	31.3±5.1	81.1±6.8
≥ 60	14	57.0±2.8	57.4±4.9	47.3±8.1	31.8±4.5	30.0±3.4	80.3±8.4
p-value		0.933*	0.647*	0.917*	0.545*	0.573*	0.917*
Gender							
Female	17	57.0±3.0	57.4±5.5	47.8±6.9	30.2±3.4	30.1±4.5	80.1±8.3
Male	13	57.4±3.0	58.6±2.9	45.6±7.1	32.8±5.1	31.3±4.1	81.2±6.6
p-value		0.817*	0.675*	0.368*	0.213*	0.408*	1.000*
Marital status							
Married	24	57.0±3.2	57.5±4.8	46.1±6.6	31.5±4.6	31.2±4.4	80.1±7.8
Single	6	58.0±1.6	59.8±2.6	49.8±8.3	30.5±3.1	29.0±4.0	83.5±6.1
p-value		0.403*	0.275*	0.337*	0.677*	0.286*	0.287*
Educational status							
< College	10	57.4±3.3	58.5±5.5	48.0±7.1	33.1±4.8	30.4±3.2	79.2±8.4
≥ College	20	57.1±2.9	57.7±4.1	46.3±7.1	30.5±3.9	30.8±4.9	81.5±7.1
p-value		0.595*	0.321*	0.567*	0.112*	0.1000*	0.597*
Work status							
Employed	17	57.5±3.0	57.8±4.0	48.4±7.5	30.8±3.9	30.8±4.6	81.4±8.5
Unemployed	13	56.7±3.0	58.1±5.3	45.6±6.5	32.1±4.9	30.4±4.2	80.2±6.8
p-value		0.569*	0.621*	0.346*	0.462*	0.834*	0.476*

STAI-I (State anxiety)
STAI-II (Trait anxiety)
ESCA (Self care agency)
**p > 0.05*

Table 2. Comparison of stress and self-care agency scores of the patients (N=30)

Parameters	Before sessions x±SD	After sessions x±SD	t	p
Anxiety level				
STAI-I	57.2 ± 3.0	31.3 ± 4.3	**31.155**	p=0.001
STAI-II	58.0 ± 4.5	30.7 ± 4.3	**24.799**	p=0.001
ESCA	46.8 ± 7.0	80.7 ± 7.5	**-21.142**	p=0.001

**p < 0.05*

Discussion

The result of the present study demonstrated that the absence of a significant difference in terms of anxiety levels and self-care agency according to the individual characteristics of the patients($p>0.05$) (Table 1). It was an important finding in terms of indicating the effect of yoga on anxiety and self-care agency, independent from individual characteristics. In studies investigating the relationship between the individual characteristics of the patients and anxiety levels after CABG surgery, controversial results was reported. [1,4,5] In studies investigating the self-care agency levels of patients with chronic diseases in Turkey, the self-care agency did not show a significant difference in terms of the individual characteristics of the patients, similar to the findings of the present study.[9,10,18]

In this study, the anxiety levels reported by the patients were high and the self-care agency was low one month after CABG surgery (Table 2). This situation may arise from the inadequacy of patients in coping with physiological, psychological and social problems, and the patients' fulfilling their daily activities with the help of others in the early postoperative period, since knowledge about the health status and the disease, and the skills and attitudes for self-care are important for coping with the disease. As reported in the literature, patients experience physiological, psychological and social difficulties during the recovery period following CABG surgery.[19,20] The accompanying symptoms affect the daily activities of the patients.[8] In a study investigating the patients' need for home care after cardiovascular surgery, they were found to experience physiological problems with respect to feeding (95.6%), excretion (86.7%), activity (100%), and sleep (88.9%) one week after discharge; physiological and social problems such as cognition and perception (100%), self-perception (55.5%), role and relationship (80%), sexuality (64.5%), coping with stress and stress tolerance (100%), value and belief (33.3%) were observed. In the same study, an increase was determined in problems concerning feeding, self-perception and sexuality, and a decrease was found in other problems six weeks after discharge.[21]

In studies focusing on the physiological effects of yoga in cardiovascular diseases, yoga has been reported to positive effects.[2,14,15,22] Besides its improving effects on the physiological symptoms through suppressing the autonomous nervous system, the psychological effects of yoga should not be ignored. After CABG surgery, 20-55% of the patients have anxiety and 20-45% experience depression.[23] These conditions may lead to an increase in mortality and a decrease in the quality of life, since increased stress-induced cathecolamine levels have negative effects on the immune system and cardiac health. Yoga has been reported to improve wellness[13], the patients' quality of life,[14] and the health-related attitudes through making changes in the life style, and plays an important role in prevention of cardiovascular diseases.[2] Moreover, in studies focusing on the effect of yoga on anxiety, it was reported that well-being and vigor improved[13] besides the decrease in the state and trait anxiety levels in patients in the yoga group compared to that of the control group.[13,24]. Furthermore, in studies conducted with breast cancer patients, yoga sessions were found to decrease the anxiety level and improved the patients' quality of life.[13,25] In this study, the stress levels of the patients were seen to decrease significantly after the yoga program compared to the stress level before the yoga program ($p<0.05$) (Table 2). Our results verify the results of previous studies.[13,22,24,25]

In this study, the significant improvement in self-care agency after the yoga sessions compared to the condition before the sessions ($p<0.05$) (Table 2) may have arisen from: improvement of physical health through yoga exercises, improvement of mental health through learning how to relax, with the yoga sessions being a social group enabling patients to share their problems and providing social support, enabling patients to do their daily acitvities easier and reduction of anxiety levels. Hence, it was demonstrated in different studies that the physical exercise capacity of the patients and the tolerance to daily life activities improved following yoga sessions applied in combination with medical therapy in cardiovascular diseases,[15] and that yoga is a positive source for social support,[2,23,25] and that yoga decreased the anxiety levels [22] and improved the quality of life.[14] Although we did not encounter any studies investigating the effect of yoga on patients' self-care agency, a positive correlation has been demonstrated betwe-

en the quality of life and self-care agency in studies conducted in Turkey.[10,18] Although the question whether the quality of life improves self-csre agency or vice versa is contraversial, self-care agency and the quality of life have been reported to affect each other parallelly. [10]

Conclusion

Patients feel fear and anxiety due to obscurity about the future after CABG surgery. After surgery, a negative mood such as anxiety and poor self-care agency may negatively affect the therapy process by impairing the compliance with therapy and may lead to an impairment in the quality of life. Hence, it must be taken into consideration that by providing support for physical activity, yoga applied by proffessionals provides positive effects in cardiac surgery for the patient and the family.

References

1. *Douki ZE, Vaezzadeh N, Shahmohammadi S, Shahhosseini Z, Tabary SZ, Mohammadpour RA, et al. Anxiety before and after coronary artery bypass grafting surgery: Relationship to QOL. Middle-East Journal of Scientific Research 2011; 7: 103-8.*
2. *Innes KE, Bourguignon C, Taylor AG. Risk indices associated with the insulin resistance syndrome, cardiovascular disease, and possible protection with yoga: A systematic review. J Am Board Fam Pract 2005; 18: 491-519.*
3. *Pignay-Demaria V, Lesperance F, Demaria RG, Frasure-Smith N, Perrault LP. Depression and anxiety and outcomes of coronary artery bypass surgery. Ann Thorac Surg 2003; 75: 314-21.*
4. *Elliott PC, Murphy BM, Oster KA, Le Grande MR, Higgins RO, Worcester MUC. Changes in mood states after coronary artery bypass graft surgery. Eur J Cardiovasc Nurs 2010; 9: 188-94.*
5. *Kustrzycki W, Rymaszewska J, Malcher K, Szczepanska-Gieracha J, Biecek P. Risk factors of depressive and anxiety sysptoms 8 years after coronary artery bypass grafting. Eur Journal of Cardiothorac Surg 2012; 41: 302-6.*
6. *Gallagher R, McKinley S. Stressors and anxiety in patients undergoing coronary artery bypass surgery. Am J Crit Care 2007; 16: 248-57.*
7. *Tung HH, Hunter A, Wei J. Coping, anxiety and quality of life after coronary artery bypass graft surgery. J Adv Nurs 2008; 61: 651-63.*
8. *Rosenfeldt F, Braun L, Spitzer O, Bradley S, Shepherd J, Bailey M, et al. Physical conditioning and mental stress reduction - a randomized trial in patients undergoing cardiac surgery. BMC Complement Altern Med 2011; 11: 20.*
9. *Altıparmak S, Fadıloğlu Ç, Gürsoy ŞT, Altıparmak O. Kemoterapi tedavisi alan akciğer kanserli hastalarda öz bakım gücü ve yaşam kalitesi ilişkisi. Ege Tıp Dergisi 2011; 50: 95-102.*
10. *Akyol AD, Karadakovan A. Hemodiyalize giren hastaların yaşam kalitesi ve öz bakım gücü ile bunlar üzerine etkili değişkenlerin incelenmesi. Ege Tıp Dergisi 2002; 41: 97-102.*
11. *Ciftçi Ç, Duman BS, Çağatay P, Demiroğlu C, Aytekin V. Koroner baypas geçiren olgularda faz II kardiyak rehabilitasyon programının etkileri. Anadolu Kardiyol Derg 2005; 5: 116-21.*
12. *Chauhan U, Baker D, Edwards R, Hann M. Improving care in cardiac rehabilitation for minority ethnic populations. Eur J Cardiovasc Nurs 2010; 9: 272-7.*
13. *Field T. Yoga a clinical research review. Complement Ther Clin Pract 2011: 17; 1-8.*
14. *Pullen PR, Thompson WR, Benardot D, Brandon LJ, Mehta PK, Rifai L, et al. The benefits of yoga for African American heart failure patients. Med Sci Sports Exerc 2009; 42: 651e7.*
15. *Kırılmaz B. Kalp yetersizliği olan hastalarda inflamasyon ve egzersiz kapasitesine yoga'nın etkisi. KY Bülteni 2009; 1: 1-5.*
16. *Le Compte WA Oner N. Development of the Turkish edition of state-trait anxiety inventory. In: Cross-cultural anxiety. Spielberg CD, Diaz Guerro R, (Eds), Washington DC: Hemishere Publishing Co; 1976. pp 51-68.*
17. *Nursen O, Nahcıvan A. Turkish Language equivalence of the Exercise of Self-Care Agency Scale. West J Nurs Res 2004; 7: 813-24.*
18. *Düzöz GT, Çatalkaya D, Uysal DD. Tip 2 diyabetes mellituslü hastaların öz bakım gücünün değerlendirilmesi. Yeni Tıp Dergisi 2009; 26: 210-3.*
19. *Dunkley M, Ellard D, Quinn T, Barlow J. Coronary artery bypass grafting: Patients' and healh professionals' views of recovery after hospital discharge. Eur J Cardiovasc Nurs 2008; 7: 36-42.*
20. *Mullen-Fortino M, O'Brien N. Caring for a patient after coronary artery bypass graft surgery. Nursing 2008; 38: 46-52.*
21. *Yılmaz M, Çiftçi ES. Açık kalp ameliyatı geçirmiş bireylerin evde bakım gereksinimlerinin belirlenmesinde bir model: Fonksiyonel sağlık örüntüleri. Türk Göğüs Kalp Damar Cerrahisi Dergisi 2010; 18: 183-9.*

22. *Yogendra J, Yogendra HJ, Ambardekar S, Lele RD, Shetty S, Dave M, et al. Beneficial effects of yoga lifestyle on reversibility of ischaemic heart disease: caring heart project of International Board of Yoga. J Assoc Physicians India 2004; 52: 283e9.*

23. *Krannich JHA, Weyers P, Lueger S, Herzog M, Bohrer T, Elert O. Presence of depression and anxiety before and after coronary artery bypass graft surgery and their relationship to age. BMC Psychiatry 2007; 7: 47.*

24. *Javnbakht M, Hejazi Kenari R, Ghasemi M. Effects of yoga on depression and anxiety of women. Complement Ther Clin Pract 2009; 15: 102-4.*

25. *Ulger O, Yağlı NV. Effects of yoga on the quality of life in cancer patients. Complement Ther Clin Pract 2010; 16: 60-3.*

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