The Journal of Medical Research

Research Article

JMR 2018; 4(5): 234-239
September- October
ISSN: 2395-7565

www.medicinearticle.com
Received: 02-09-2018
Accepted: 06-10-2018

Effect of Listening to Preferred Music on General Comfort Level among Patients Underwent Coronary Artery Bypass Graft Surgery: A Randomized Controlled Trial

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Abstract

Background: Patients undergo Coronary Artery Bypass Graft (CABG) surgery experience varying degrees of discomfort. Few studies evaluate the effect of music on patients` comfort. **Aims and objectives:** The aim of this study was to determine effect of listening to music on general comfort level of patients underwent CABG surgery. **Study Design:** This was a randomized controlled trial. **Setting:** This study was conducted in open heart surgery Intensive Care Unit (OH-ICU) in Imam Khomeini Hospital affiliated to Tehran University of Medical Sciences. **Materials and Methods:** 65 patients with age between 30 to 75 years, stable hemodynamic condition, no substance abuse, no hearing problems and underwent CABG surgery for the first time were allocated to two groups of intervention and control by block balanced randomization method. Intervention was listening to preferred light and instrumental music for 30 minutes in day after surgery at 4 to 6 PM by MP3 player and individual headphone, while patients in the control group received usual care. Study outcome was general comfort level that was measured by general comfort questionnaire (GCQ) at baseline and at end of the study. **Statistics:** SPSS software version 16 was used. Data were described and analyzed by descriptive statistics and statistical tests. A P-value less than 0.05 was considered statistically significant. **Results:** At end of the study, 62 patients (31 patients in each group) completed the study. There is no significant difference between the two groups at baseline regarding demographic and clinical characteristic (P>0.05). Although patients` general comfort level was not different between intervention and control groups (47.10 ±2.04, and 47.10 ±1.95; P= 1.000), it improved significantly following the intervention in the intervention group compared with control group (45.48±2.01 vs 47.29±1.95; P< 0.001). **Conclusion:** Our study indicated that listening to preferred music can be used as a non-invasive intervention by nurses for patients underwent CABG surgery during hospitalization in order to improve their general comfort level.

Keywords: Music, Patient Comfort, Coronary Artery Bypass, Randomized Controlled Trial

INTRODUCTION

Nowadays, coronary artery bypass graft (CABG) surgery is one of the most common surgeries performed by cardiovascular surgeons [1]. According to patients` experiences from hospitalization to discharge, their physical, psychological, and educational needs did not address during the care period [2] and comfort in physical, psychological, and environmental dimensions was a missed concept [3].

According to the book entitled "Comfort Theory and Practice", comfort is a term that shows "relaxed, healthy, peaceful, and individualized condition" for each patient. When patients were in comfortable status, "they socialized informally with others, wandered casually, sat easily, napped, cooperated with staff, laughed, or hummed, and generally displayed ease and contentment within their surroundings" [4]. There are three types of comfort care intervention include "standard comfort interventions, coaching, and comfort food for the soul" that listening to music is one of the subtypes of the comfort food for the soul [5]. In Ozer *et al* study in 2013, music intervention was considered as a complementary, noninvasive, secure and cost- effective intervention used to alleviate pain after CABG [6]. It plays a key role among humans with different cultures and affects physiologic and clinical symptoms, directly and indirectly [7].

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In addition, previous studies showed the positive effects of listening to music on reducing pain [8, 9], anxiety [10, 11], systolic and diastolic blood pressure (SBP, and DBP), heart rate (HR), and saturated pressure of oxygen (SpO2) [12], enhancing a sense of comfort and relaxation, clinical performance, distraction from pain [7], and increasing patient satisfaction (11) after cardiac surgery. According to a systematic review and meta-analysis, music lead to reduce postoperative pain, anxiety, and analgesia use, and increase patient satisfaction during the postoperative period [13]. In addition, patients mentioned that listening to music helps them forget their pain and reduce their need to analgesics [14].

Since patients receive more comfort from human resources than the environment and modern devices, the role of nurses and humanistic nursing care is important in providing patient comfort [15]. Because such intervention is provided under the direct supervision of the nurse without physician order, this can promote nursing autonomy by affecting the patients` environment [8].

Although previous studies showed several positive effects of music intervention on patients undergoing CABG surgery, its effect on the comfort of the patients has not been reported, yet. As music with relaxing quality, and culturally appropriateness should be provided to patients (8), the aim of this study was to evaluate the effect of listening to preferred music on comfort of patients after CABG surgery.

MATERIALS AND METHODS

We performed a single-blind, randomized, controlled trial (IRCT code no.: IRCT201310234443N6 on IRICT.ir). This trial was approved by institutional review board (IRB) and research ethics committee of Tehran University of Medical Sciences (TUMS) (Tehran, Iran).

In this trial, patients from both sexes with age between 30 to 75 years who understood Farsi language, underwent CAGB surgery for the first time and non- emergency condition, without severe bleeding and with less than 8 hours of operation duration, with stable hemodynamic conditions (SBP more than 90 mmHg, no dangerous cardiac dysrhythmias, and HR between 60 to 100 beat per minutes), without psychiatric and cognitive disorders, without substance abuse, hearing problems, and consumption of sedative, relaxant, hypnotic, and antianxiety medications, and without chronic disorders confounding the patient`s comfort such as discopathies were included to the study. Thus, patients expired during the study period, with acute complications of the surgery (e.g., chest tube bleeding more than 200 milliliters per hour, cardiac tamponed, threatening cardiac dysrhythmias and any emergency conditions requiring immediate interventions), and no tendency to continue the study were excluded.

Sample size was estimated to be 62 patients (31 patients in each group) by the following formula according to Payami and Mousavinasab study in 2008 and mean and standard deviation of 35.64 ± 6.9 and 47.36± 6.98 for comfort feeling before and after the intervention (16) and based on 95% confidence level (α= 0.05), and 80% study power (β=20%) in order to detect 5 score difference for comfort score between the intervention and control group.

$$n = \frac{\left(z_{1-\alpha/2} + z_{1-\beta}\right)^2 (s_1^2 + s_2^2)}{d^2}$$

Thus, recruitment of 62 eligible patients was done in the evening of the first day CABG surgery between November 2013 to February 2014 from open heart surgery Intensive Care Unit (OH- ICU) in Imam Khomeini Hospital affiliated to TUMS. Eligible patients signed informed consent form before random allocation and they were allocated to two groups of intervention and control by block balanced randomization method. Thus, sixteen 4- size blocks were prepared and were put in an envelope. Then, patients` allocation to intervention and control group was determined by randomly selection of each envelope by researcher.

For patients in the intervention group, 4 light and instrumental music, with tempo/rhythm in a range of 60 to 80 beats per minute (bpm) and at 50 to 60 decibels (dB), was played for each patient in day after surgery at 4 to 6 PM, separately. Then, they selected their preferred music from the playlist and listened to it for 30 minutes by MP3 player (Marshal ME-658) and individual headphone (Philips SHP2500) made by China. While patients in the control group received usual care and they rested for half an hour in their bed.

General comfort level was the study outcome which was evaluated at baseline and at end of the study. It was measured by Kolcaba General Comfort Questionnaire (GCQ) which was developed by Kolcaba in 1992. In order to use Iranian version of this questionnaire, it was translated to Farsi language by forward- backward translation method. Content validity of the questionnaire was approved by 10 faculty members of nursing and midwifery school at TUMS. In order to assess the reliability, 10 patients underwent CABG surgery completed the GCQ and the Alpha Cronbach was 0.78. This questionnaire contained 21 items that elicited information on three subscales: physical (items 1-6), environmental (items 7-13), and psychological (items 14-21) dimensions. All items of this questionnaire were scored on a Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). The total GCQ score range was between 21 to 84 and lesser scores indicated the higher levels of comfort.

Study variables were age, BMI, gender, marriage status, level of education, income, and job as demographic variables, and family history of cardiovascular diseases (CVDs) and CABG, history of admission to ICUs, comorbidities, medications, involved vessel in coronary angiography, and duration of surgery as clinical variables which was collected by a checklist according to patients` clinical record.

Statistical Analysis

SPSS software version 16 was used. Data were described and analyzed by descriptive statistics such as frequency, partial frequency percent, mean, and standard deviation and statistical tests such as chi square, Fisher exact test, and independent t- teat. A P-value less than 0.05 was considered statistically significant.

RESULTS

In this trial, eligibility criteria of 138 patients underwent CABG surgery were assessed and data related to 62 patients (31 patients in each group) were analyzed. **Figure 1** is Consolidated Standards of Reporting Trials (CONSORT) flow diagram that indicates the trial process from patients` recruitment to statistical analysis.

Demographic and clinical characteristics of patients underwent CABG surgery in the two groups of intervention and control has been shown in **Table 1**. According to this table, no significant difference was found between the two groups at baseline regarding demographic and clinical characteristics (P>0.05) (**Table 1**).

In table 2, means and standards deviation of total general comfort level and general comfort level in physical, environmental, and psychological dimensions have been compared. According to this table, although total general comfort level and its three dimensions were not different at baseline between the two groups, it improved significantly following the intervention **(Table 2).**

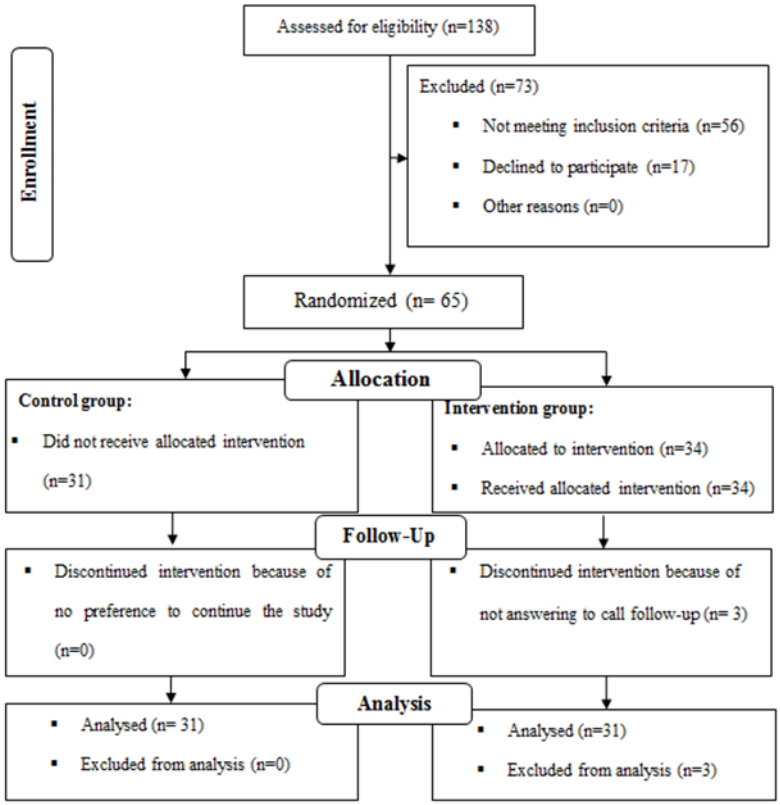

Figure 1*:* CONSORT flow diagram

Table 1: Demographic and clinical characteristics of patients underwent CABG surgery in the intervention and control groups

Demographic and clinical variables		**Intervention (n=31) Frequency (%)**	**Control (n=31) Frequency (%)**	**P-value**
Age (years), M±SD		58.19±7.69	59.58 ± 7.18	0.466
BMI (Kg/ m2), M± SD		28.03±2.62	27.26±2.76	0.265
Gender	Male	19 (61.3)	18 (58.1)	0.796
	Female	12 (38.7)	13 (41.9)	
Marital status	Married	27 (87.1)	29 (93.5)	0.671
	widowed	4 (12.9)	2 (6.5)	
Level of education	Illiterate	9 (29.0)	7(22.6)	0.840
	Elementary school	11(35.5)	12 (38.7)	
	Guidance school	2 (6.5)	1(3.2)	
	High school	6(19.3)	9 (29.0)	
	Academic	3 (9.7)	2 (6.5)	
Income	Enough	4 (13.0)	5 (16.1)	0.665
	Not enough	27 (87.0)	26 (83.9)	
Job	Yes	19 (61.3)	20 (64.5)	0.956
	No	12 (38.7)	11 (35.5)	
Family history of CVDs	Yes	15 (48.4)	13(41.9)	0.610

	No		16 (51.6)	18 (58.1)	
Family history of CABG	Yes		3 (9.7)	5 (16.1)	0.707
	No		28 (90.3)	26 (83.9)	
History of admission to ICUs	Yes		16 (51.6)	15 (48.4)	0.799
	No		15 (48.4)	16 (51.6)	
Comorbidities	Diabetes	Yes	14 (45.2)	12 (38.7)	0.607
		No	17 (54.8)	19 (61.3)	
	Hypertension	Yes	7 (22.6)	8 (25.8)	0.767
		No	24 (77.4)	23 (74.2)	
	Hyperlipidemia	Yes	11(35.5)	12 (38.7)	0.793
		No	20 (64.5)	19 (61.3)	
	Kidney disease	Yes	3 (9.7)	7 (22.6)	0.167
		No	28 (90.3)	24 (77.4)	
	Respiratory disease	Yes	3 (9.7)	6 (19.4)	0.473
		No	28 (90.3)	25 (80.6)	
Medications	Nitrate	Yes	10 (32.3)	9 (29.0)	0.783
		No	21 (67.7)	22 (71.0)	
	Beta Blockers	Yes	28 (90.3)	27 (87.1)	0.999
		No	3 (9.7)	4 (12.9)	
	Calcium Channel Blockers	Yes	3 (9.7)	5 (16.1)	0.707
		No	28 (90.3)	26 (83.9)	
	NSAIDs (Aspirin)	Yes	24 (77.4)	28 (90.3)	0.167
		No	7 (22.6)	3 (9.7)	

Tale 1 (Cont.): Demographic and clinical characteristics of patients underwent CABG surgery in the intervention and control groups

Demographic and clinical variables			**Intervention (n=31) Frequency (%)**	**Control (n=31) Frequency (%)**	**P-value**
Number of Involved vessel in coronary angiography	One		4 (13.0)	3 (9.7)	0.656
	Two		6 (19.3)	9 (29.0)	
	Three		21 (67.7)	19 (61.3)	
Involved vessels in coronary angiography	RCA	Yes	27 (87.1)	28 (90.3)	0.999
		No	4 (12.9)	3 (9.7)	
	LAD	Yes	21 (67.7)	19 (61.3)	0.596
		No	10 (32.3)	12 (38.7)	
	LCX	Yes	24 (77.4)	22 (71.0)	0.562
		No	7 (22.6)	9 (29.0)	

	LMCA Yes	7 (22.6)	9 (29.0)	0.562
	No	24 (77.4)	22 (71.0)	
Duration of Surgery	3-5 Hours	5 (16.1)	7 (22.6)	0.520
	5-7 Hours	26 (83.9)	24 (77.4)	

Table 2: Comparison of mean and standard deviation of general comfort level of patients underwent CABG surgery in the intervention and control groups

				Intervention (n=31) M± SD	**Control (n=31) M± SD**	**P_value**
General Comfort Level		Physical	Before	12.52±1.26	12.58±1.33	0.846
			After	12.00±1.00	12.68±1.37	0.030*
		Environmental	Before	15.39±0.84	15.45±1.09	0.795
			After	15.00±0.73	15.48±1.09	0.045*
		Psychological	Before	19.19±0.98	19.06±1.06	0.621
			After	18.48±1.15	19.13±1.05	0.025*
		Total	Before	47.10±2.04	47.10±1.95	1.000
			After	45.48±2.01	47.29±1.95	0.001*

*statically significant

DISCUSSION

In this trial, we found the positive effect of listening to preferred music on both total general comfort level and physical, environmental, and psychological dimensions of comfort among patients underwent CABG surgery.

Single-session listening to preferred music seems to enhance physical comfort [17]. Furthermore, it has positive effects on patients` outcomes, satisfaction, and response to care provided [18]. Although, the results of the systematic review in 2008 indicated positive effects of music intervention on decreasing patients` anxiety and pain in approximately half of the reviewed studies [19], another systematic review and meta-analysis in 2015 introduced music as a complementary intervention in order to reduce pain and anxiety during patients` postoperative period [13]. Post- operative pain is one of the factors that can disturb the patients` physical comfort and increase patient`s anxiety [20]. Thus, significant reduction in pain level while listening to music has been indicated in different studies among patients with cancer, cardiac surgery, and total knee arthroplasty [12, 14, 21-23]. In addition, reduction in severity of chemotherapy symptoms [24], enhancement of physical comfort among patient undergoing hemodialysis [25], and increment of general comfort level in the intensive care unit in Turkey [26] while listening to music have been indicated. In the present study, level of physical comfort improved following the intervention which was consistent with previous studies.

In our study, listening to preferred music improved environmental comfort of patients underwent CABG surgery, significantly. Improvement of environmental comfort was indicated among patients underwent hemodialysis, too [25]. In addition, patients reported the bearable level of noise, and increased satisfaction with staying at post anesthesia care unit [27, 28]. As noise in intensive care units is one of the disturbing factor of patients` comfort, the results of the previous studies are consistent with ours. In addition, effect of music on both psychological and physical outcomes has been indicated in the previous studies. In other words, a systematic review on music interventions among patients with cancer in 2016 indicated the beneficial efficacy of music intervention on anxiety as the psychological outcome, and on fatigue and quality of life as the physical outcomes [29]. Other studies on patients undergoing cardiac surgery and patients under mechanical ventilation support showed significantly lower level of anxiety, pain, and agitation in the intervention than control group [22]. In opposite of previous studies on positive effect of music on psychological comfort, another study showed lower anxiety with no significant difference that may be due to the difference in conducting the intervention [30]. While in our study, patients experienced much more level of psychological comfort following the intervention compared with control group.

CONCLUSION

As a result, listening to preferred music may improve general comfort level of patients underwent CABG surgery. Thus, music intervention can be applied in accordance with usual care as a non-pharmacological, inexpensive, and non-invasive intervention by nurses in order to improve patients` comfort totally and its physical, environmental, and psychological dimensions following CABG surgery.

Conflict of Interest

The authors declare no conflict of interest.

Authors' Contribution

All the authors fulfilled the authorship criteria.

Acknowledgement

This article was derived from the MS thesis of Mr. Elyas Soltani for field of critical care nursing at Tehran University of Medical Sciences (Tehran, Iran). Authors would like to thank the IRB and REC of TUMS in order to approve the research project and patients for participation in the study.

REFERENCES

1. Diodato M, Chedrawy EG. Coronary Artery Bypass Graft Surgery: The Past, Present, and Future of Myocardial Revascularisation. Surgery Research and Practice. 2014; 2014:1-6.
2. Shafipour V, Mohammadi E, Ahmadi F. Experience of open heart surgery patients from admission to discharge: a qualitative study. Iranian Journal of Critical Care Nursing. 2013; 6(1):1-10.
3. L. Jouybari, Oskouie F, F. Ahmadi. Comfort of Hospitalized Patients: A Missed Concept. Iran Journal of Nursing. 2006; 19 (47):89-101.
4. Kolcaba K .Comfort theory and practice: a vision for holistic health care and research: Springer Publishing Company; 2003.
5. Wilson L, Kolcaba K. Practical application of comfort theory in the perianesthesia setting. Journal of PeriAnesthesia Nursing. 2004; 19(3):164-73.
6. Özer N, Karaman Özlü Z, Arslan S, Günes N. Effect of Music on Postoperative Pain and Physiologic Parameters of Patients after Open Heart Surgery. Pain Management Nursing. 2013; 14(1):20-8.
7. Kemper KJ, Danhauer SC. Music as therapy. South Med J. 2005; 98(3):282-8.
8. Mirbagher Ajorpaz N, Mohammadi A, Najaran H, Khazaei S. Effect of Music on Postoperative Pain in Patients Under Open Heart Surgery. Nursing and Midwifery Studies. 2014; 3(3): e20213.
9. Phadke SSD, Parkar H, Yardi S. Effect of music intervention on immediate post operative coronary artery bypass graft surgery (CABG) patients. Indian Journal of Physiotherapy and Occupational Therapy-An International Journal. 2014; 8(4):106-11.
10. Heidari S, Babaii A, Abbasinia M, Shamali M, Abbasi M, Rezaei M. The Effect of Music on Anxiety and Cardiovascular Indices in Patients Undergoing Coronary Artery Bypass Graft: A Randomized Controlled Trial. Nursing and Midwifery Studies. 2015; 4(4):e31157.
11. Rafiei H. Effect of Listening to Preferred Music on Intensity of Pain and Physiologic Parameters in Patients Undergoing Coronary Artery Bypass Grafting Surgery. IOSR Journal of Nursing and Health Science. 2016; 5(4):79-82.
12. Emami Zeydi A, Jafari H, Khani S, Esmaeili R, Gholipour Baradari A. The Effect of Music on the Vital Signs and SpO2 of Patients after Open Heart Surgery: A Randomized Clinical Trial. Journal of Mazandaran University of Medical Sciences. 2011; 21(82):73-82.
13. Hole J, Hirsch M, Ball E, Meads C. Music as an aid for postoperative recovery in adults: a systematic review and meta-analysis. The Lancet. 2015; 386(10004):1659-71.
14. Allred KD, Byers JF, Sole ML. The Effect of Music on Postoperative Pain and Anxiety. Pain Management Nursing. 2010; 11(1):15-25.
15. shafipour v, Mohammadi E, Ahmadi f. The Perception of Cardiac Surgery Patients on Comfortable Resources: A Qualitative Study. Journal of qualitative Research in Health Sciences. 2012; 1(2):123-34.
16. Payami M MN. Efficacy of Back Massage on Irritable Bowel Syndrome(IBS) Using Colcaba Comfort Theory. journal of ilam university of medical sciences. 2008; 16(2):36-43.
17. Krout RE. The effects of single-session music therapy interventions on the observed and self-reported levels of pain control, physical comfort, and relaxation of hospice patients. American Journal of Hospice and Palliative Medicine®. 2001; 18(6):383-90.
18. Mogos MF, Angard N, Goldstein L, Beckstead JW. The effects of live therapeutic music on patient's affect and perceptions of care: A randomized field study. Complementary Therapies in Clinical Practice. 2013; 19(4):188-92.
19. Nilsson U. The Anxiety- and Pain-Reducing Effects of Music Interventions: A Systematic Review. AORN Journal. 2008; 87(4):780-807.
20. Kolcaba K, Wilson L. Comfort care: A framework for perianesthesia nursing. Journal of PeriAnesthesia Nursing. 2002; 17(2):102-14.
21. Huang S-T, Good M, Zauszniewski JA. The effectiveness of music in relieving pain in cancer patients: a randomized controlled trial. International journal of nursing studies. 2010; 47(11):62-1354:
22. Sendelbach SE, Halm MA, Doran KA, Miller EH, Gaillard P. Effects of music therapy on physiological and psychological outcomes for patients undergoing cardiac surgery. Journal of cardiovascular nursing. 2006; 21(3):194-200.
23. Özer N, Özlü ZK ,Arslan S, Günes N. Effect of music on postoperative pain and physiologic parameters of patients after open heart surgery. Pain Management Nursing. 2013; 14(1):20-8.
24. Bilgiç Ş, Acaroğlu R. Effects of Listening to Music on the Comfort of Chemotherapy Patients. Western Journal of Nursing Research. 2016; 39(6):745-62.
25. Zarurati M, Pishgooie S, Farsi Z, Karbaschi K. The effect of music therapy on comfort level and some vital signs of patients undergoing hemodialysis. Military Caring Sciences. 2017; 3(4): 221-32.
26. Çiftçi H, Öztunç G. The effect of music on comfort, anxiety and pain in the intensive care unit: a case in Turkey. International Journal of Caring Sciences. 2015; 8(3):594.
27. Easter B, DeBoer L, Settlemyre G, Starnes C, Marlowe V, Tart RC. The Impact of Music on the PACU Patient's Perception of Discomfort. Journal of PeriAnesthesia Nursing. 2010; 25(2):79-87.
28. Thorgaard P, Ertmann E, Hansen V, Noerregaard A, Hansen V, Spanggaard L. Designed sound and music environment in postanaesthesia care units—a multicentre study of patients and staff. Intensive and Critical Care Nursing. 2005; 21(4):220-5.
29. Bradt J, Dileo C, Magill L, Teague A. Music interventions for improving psychological and physical outcomes in cancer patients. The Cochrane Library. 2016(8).
30. Cutshall SM, Anderson PG, Prinsen SK, Wentworth LJ, Brekke KM, Li Z, et al. Effect of the combination of music and nature sounds on pain and anxiety in cardiac surgical patients: a randomized study. Alternative therapies in health and medicine. 2011; 17(4):16.