

Review

## Methods of Complementary and Alternative Medicine In Cardiac Rehabilitation

Alexander V. Karnitsky, PhD\*

Omsk State Medical Academy, Omsk, Russian Federation

---

### Abstract

Cardiac rehabilitation (CR) includes certain measures aimed at the prevention of further development of major cardiovascular diseases (CVD). Everywhere, patient awareness of CR appears to be low. This paper attempts to raise the awareness of patients to CR and proposes the implementation of some complementary and alternative medicine (CAM) methods. This report presents some of the basic CAM methods, including discussions on the possibility of the application of certain other CAM methods including yoga, tai chi, qigong, acupuncture therapy, music therapy in CR. IJBM 2011; 1(4):236-241. © 2011 International Medical Research and Development Corporation. All rights reserved.

**Key words:** *rehabilitation; cardiovascular diseases; complementary therapies; medicine, traditional; medicine, Chinese traditional; acupuncture therapy; exercise therapy; music therapy.*

Cardiac rehabilitation (CR) includes certain measures aimed at the prevention of further development of major cardiovascular diseases (CVD) [1]: patient assessment, nutritional counseling, lipid management, hypertension management, smoking cessation, weight management, diabetes management, psychosocial management, physical activity counseling, and exercise training.

Systematic physical training is one of the most important factors, which increases the quality of life of cardiology patients [1-4].

CR is included under coronary heart disease (CHD), arterial hypertension, obesity, metabolic syndrome, dyslipidemia, etc.

The purpose of CR is to reduce the risk of acute coronary episodes, stroke, lesion of the peripheral arteries; the prevention of disability and premature death [2-4]. CR facilitates CVD patients to enjoy an active social life and improves their quality of life [1-4].

The main drawback is that the CR activities should be performed over a long time, ideally for life. Doctors realize that CR is both important and necessary; however, although patients agree with this concept, the commitment of the patients to CR everywhere is low [1, 5-8].

Expressed simply, most patients do not want to do CR; they are just not interested. Why? The question, therefore, is how to increase patient interest. Perhaps, along with the objective of increasing patient interest and commitment, there is an inclination, besides the standard CR methods, to use some other methods that are not contrary to the canons of modern official medicine (MOM), but which will be of considerable interest to the patients.

Many patients evince interest in complementary and alternative medicine (CAM); not merely interest, but often prefer CAM to MOM. The number of visits to the CAM services suppliers in the United States, for example, exceeds the number of patient visits to primary care physicians, and each year Americans spend about \$30 billion on such services [9]. Almost half of all Americans use different forms of CAM, often in addition to the tools employed by MOM [10]. There is now a clear trend towards an increase in the CAM treatment of adult patients of all age groups, including older people [11]. Most patients do not inform doctors of their CAM use [10, 11]. Growth in CAM use has reached such a degree that modern official medicine can no longer ignore its methods [12].

### What is CAM?

CAM combines diagnostics, treatment and prevention methods, which currently do not enjoy universal acceptance, and are not part of MOM.

Some of the reasons that lead people to look to CAM, identified as part of the negative side of the MOM

---

\*Corresponding author: Alexander V. Karnitsky, PhD,  
Department of Rehabilitation Medicine, Omsk State Medical  
Academy, 1, Leningradskaya sq., apt. 102, 644010, Omsk,  
Russian Federation Tel: 7-905-9424103. Fax: 7-3812-659727  
E-mail: karn1961@mail.ru

(it is not always of the highest quality, the high cost, the dictatorship of the equipment over a man, in some cases, insufficient attention to the patient personality), and the positive side of CAM (the desire for individualization of treatment, the treatment of the whole person, to the realization of psychological peculiarities of each patient) [12, 13].

In a survey of patients, the university clinic of Freiburg (Germany) identified the following reasons patients turn to the representatives of CAM: aversion to chemicals; the desire to participate in decision-making related to the treatment; the desire to change the lifestyle; the desire of a holistic approach to the treatment [14].

Many patients, as well as several doctors believe that there is nothing in common between MOM and CAM. However, this is not true. MOM has centuries-old history and is rooted in antiquity. In its long history of development and formation, MOM has absorbed the best of medical knowledge, practice and skills of all times and peoples.

MOM has a high sense of doctor responsibility for their actions. MOM, however, contrary to the CAM, is based on the criteria of evidence-based medicine and demands strong evidence of the effectiveness of the methods of treatment, prevention or diagnosis by methodologically correctly completed randomized controlled trials (RCT). Methods, with no confirmation of the effectiveness of the RCT are rejected, regardless of their apparent efficiency.

For most part, CAM is characterized by the absence of clear rules and subjectivism in the application, and hence raises the impossibility of conducting scientific studies of their effectiveness.

In most cases, CAM methods are not at all regarded by scientists, or are not accepted to arrive at an unambiguous conclusion about their effectiveness and safety. Several major scientific centers are involved in research in this field, including the National Cancer Institute (USA), the National Center for Complementary and Alternative Medicine (USA), MD Anderson Cancer Center (USA), The Institute for Complementary and Natural Medicine (UK), etc.

A uniform and generally accepted classification of CAM does not exist; however, the following sections [13, 15] are involved:

1. Alternative medical systems (AMS): traditional Chinese medicine, Ayurvedic medicine, naturopathy, homeopathy, a system based on cultural traditions of indigenous people of North America, Tibet, Spain, Africa etc.

2. Biological treatment approaches based on the use of biological resources: phytotherapy (treatment plants), herbal nutritional supplements, special diets, aromatherapy, etc.

3. Handling and body-oriented methods, based on body manipulation: massage, acupuncture, manipulative therapy, chiropractic, osteopathy, etc.

4. Energy therapy. There are two types of energy therapy:

Therapy biofields, where the methods employed are associated with the energy impact of the preconceived energy fields surrounding a person, found both inside and outside of his body: qigong, therapeutic touch, Reiki, etc.

Therapy using electromagnetic radiation and magnetic fields.

5. Psychosomatic approaches, based on the representation of the vast possibilities of the psyche in the regulation of the activities of the human organism: meditation, hypnosis, self-hypnosis, autogenic training, progressive muscle relaxation, art-, dance-, music therapy, biofeedback, etc. The use of spiritual approaches and systems also include the faith-based approaches and practices (Christian, Buddhist, Islamic, Hindu, etc.), as well as those not belonging to any particular religions approach and practice (shamanism, etc.).

Each alternative system has its own theory of and treatment for diseases.

Homeopathy is the AMS, based on the assumption that highly diluted substances stimulate therapeutic response.

Naturopathy (NP) is the AMS, which rises from the concept of the natural ability of the body to heal itself and focus on the natural resources. NP includes the fundamentals of classical medicine, herbal medicine and methods of folk medicine [16].

Ayurvedic medicine is the AMS of ancient India. The aim of treatment in Ayurveda is the restoration of the internal harmony of man. Ayurvedic treatment includes herbal medicines, diet, yoga, massage etc. [17].

Traditional Chinese medicine (TCM) is based on the assumption that the disease is caused by a violation of the circulation of vital energy "chi" ("qi"). Acupuncture, acupressure, moxibustion, therapeutic exercises – Chinese traditional therapeutic exercises, massage, drugs of herbal and animal origin etc., are used in the treatment of diseases. Of great importance in TCM are the health-improving gymnastic systems of qigong and tai chi.

The results of several systematic reviews and meta-analyses that have been conducted over recent years are of interest from the standpoint of studying the opportunities of the use of certain methods of CAM besides the classical CR, but they are not perfect with the positions of evidence-based medicine.

The effectiveness of homeopathy has not yet been proved [18].

Given the large number of components, conducting a scientific study of the rest of the AMS in general is not possible. Some of the methods from among the range of AMS today that have already been in use in the treatment of cardiac patients, were studied in various researches, with different levels of evidence, and information about them is presented in modern literature.

Depression and psychological stress are recognized as factors of cardio-vascular risk, the effects of anxiety and panic disorders for the CHD are currently being studied by authors [19].

Chong C.S. *et al.*, performed a systematic literature search to identify randomized, clinical trials, of researchers who studied the effects of yoga on the severity of psychological stress in healthy adults [20]. The search results helped us conclude that yoga classes do help to reduce levels of psychological stress.

Pandya D.P. *et al.* [21] also expressed the view that yoga increases resistance to stress, and this, in their opinion, contributes to the prevention of the adverse outcomes of CHD.

Analysis of the results of five controlled trials conducted by the Pilkington K. *et al.*, [22], enabled the authors to arrive at a preliminary conclusion on the potentially beneficial effects of yoga with depressive disorders.

Brown RP. and Gerbarg PL. [23] paid special attention to the importance of breath in yoga (pranayama). According to the authors, pranayama shows clinical improvement in the treatment of depression, anxiety, and posttraumatic stress disorders. Pranayama arguably increases stress resistance and this eases patients suffering.

It is very important to note that yoga can be practiced at any age and without any specific level of physical preparation. Yoga classes are available to patients who are old as well as elderly, and they contribute to the improvement of patient gait, balance, increased strength and flexibility, while it reduces excess body weight [24].

One of the widespread methods of the CTM, popular in many countries of the world, is acupuncture. Middlekauff HR. [25] notes that acupuncture can improve the condition of patients with heart failure, and connects this, first of all, to its sympatholytic effect.

Wang H. *et al.*, [26] conducted a meta-analysis of eight small controlled studies involving a total of 477 persons, requiring them to comment on the effectiveness of acupuncture in the treatment of patients with depression.

From among the patients admitted to the CR, more than 80% were overweight, and more than 50% had metabolic syndrome (MS) [27]. Reduction of excess weight is becoming an important component of the CR [27, 28]. The results of a systematic review and meta-analysis conducted by Cho S.H. *et al.*, suggests that acupuncture in many cases is an effective means in the treatment of obesity [29].

Tai chi chuan is a Chinese martial art. In the middle of the 20th century, in China, a simple complex of health-improving gymnastics based on tai chi chuan, was made available for mass teaching and use. This set of exercises first became popular in China and then in other countries across the world under the name of tai chi. Recently, in spite of the fact that there are still several people who practice it as a martial art, tai chi is a common health-improving system of gymnastics.

Qigong (Qg) – this ancient Chinese art of self-regulation of the organism, is a traditional health system. The Qg includes a range of philosophical concepts and applied technologies of harmonization of the motor activity, respiration and mental state. In Qg, the concept of vital energy "chi" ("qi"), or energy, is considered paradise and is regarded as the basis for the existence of the human organism. Qg purportedly helps to save and restore the proper movement of qi in the human body. Therefore, Qg includes the practice of Chinese martial arts, meditative practices and gymnastic exercises. As a health-improving gymnastics system Qg was widespread in several countries of the world.

Jahnke R. *et al.*, analyzed 77 scientific articles, containing data on the RCT of both tai chi and Qg, and concluded regarding the positive influence of the tai chi and Qg on the physiological and psychological functions of the person [30].

Physical exercises involved in practicing tai chi are usually low or of medium intensity; therefore, it is feasible

for cardiac patients. Tai chi improves aerobic capacity and muscle strength, improves endothelial function; reduces the severity of risk factors such as hypertension and dyslipidemia. Classes of tai chi are safe and beneficial in patients with a history of previous myocardial infarction or operation of aorto-coronary bypass surgery, and patients with congestive heart failure [31].

Yeh G.Y. *et al.*, conducted a systematic review of 29 studies on the effectiveness of tai chi in patients with CHD and patients with cardio-vascular risk factors. Preliminary data showed that tai chi classes could be useful for this group of persons [32].

Tai chi and Qg are available to patients who are elderly or senile, and contributes to improving their functionality, by lowering blood pressure, and reducing the manifestations of anxiety and depression [33]. The 16-week tai-chi training to patients with clinically significant cardiac insufficiency has shown no development of complications. All the participants found the activities pleasurable and noted improvement in their well-being and quality of life [34].

A systematic review and meta-analysis of 40 studies involving 3817 men, by Wang C. *et al.*, concluded that tai chi improved the psychological status, including a reduction in stress, anxiety, depression, and improved self-esteem [35].

Posadzki P. *et al.*, advised patients to engage in yoga and Qg simultaneously. Both these alternative methods of treatment, according to the authors, can prevent the development of mental disorders, such as anxiety and depression, and minimize the manifestations of mental stress and improve quality of life [36].

A significant increase in the use of herbal remedies and herbal supplements has been noted in recent years in countries across Europe and America. More than 15 million Americans take drugs of herbal origin, which are sometimes the main treatment type for many, especially the elderly [9]. This is a growing concern for MOM doctors.

Herbal products are not safe or effective only because they have a "natural" origin. Thousands of Americans every year end up in poison control centers due to exposure to poisonous plant food additives [37]. This is often because the producers of herbal remedies and nutritional supplements are not responsible for the safety and efficacy of their products, as their activities are not controlled by the administration [37].

Various parts of plants contain several biologically active substances, sometimes competing with each other or with other drugs that patients take. Unlike drugs related to MOM, manufactured based on the available herbal raw material, but containing the only one active substance, herbal remedies and dietary supplements are largely unexplored or poorly understood and form a biochemically and physiologically active mixture, especially dangerous for children. Purchase of uncontrolled plant "drugs" may not be shown or even absolutely contraindicated.

Practically unexplored still remains the problem of adverse interactions of MOM drugs with herbal remedies and food supplements [38].

From May 1, 2011, new regulations restricting the turnover of traditional medicine and containing requirements for their registration (the directive on

traditional herbal medicinal products 2004/24/EC) [39] were put into effect, in the territory of the European Union (EU). The Special Committee on Herbal Medicinal products in the European Drug Agency developed a list of herbal substances, indicating the name, indication, dosage, route of administration and other information necessary for ensuring the safe use of essential drugs of vegetable origin. Plant substances included in the list would be registered under the simplified scheme, and will not require costly clinical trials in the case, if the indications for their application will be used by traditional medicine and are generally accepted for their condition or disease (such as chamomile or sage as an antiseptic and a mouthwash throat). The main point to be considered is the safety of the ingredients for the human use. It also introduces a requirement for the duration of the use of funds in phytotherapy practice: a minimum of 30 years in general, and 15 - in the territory of the EU. Registered products will be marked with a special sign – THR, which refers to Traditional Herbal Registration, registered as traditional plant remedies. Thus, the procedure of registration of herbal remedies and dietary supplements in Europe is consistent with the licensing of MOM drugs.

MOM drugs should be used in the treatment of CVD patients. Any decision on the possible application of any of the products of plant origin as an additional means in each case should be taken by the physician concerned individually, considering the validity of this step and the level of competence of the attending physician in the matters of herbal medicine.

The great French writer Stendhal wrote: "Perfect music leads the heart in exactly the same state, a queer, enjoying the presence of the beloved beings, that is, the music gives, undoubtedly, the most vivid of happiness only to be possible on the earth."

Bradt J. *et al.*, after analyzing the results of 24 studies, with the participation of 1461 patients, concluded that listening to music has a positive effect on the level of arterial blood pressure, heart rate, respiratory rate; therefore, it reduces symptoms of anxiety and the severity of pain syndrome in persons with CHD [40].

Okada K. *et al.*, having studied the biochemical mechanisms of the action of music therapy (MT), concluded that the MT increases the tone of the parasympathetic nervous system and reduces the symptoms of congestive heart failure by reducing the plasma levels of the cytokines and catecholamines [41].

Trappe HJ, from the results of his study, argues that classical music and music for meditation are the most beneficial to health, whereas heavy metal or techno is not only useless, but also, perhaps even dangerous, and may even lead to stress and/or life-threatening cardiac arrhythmias. The music of several composers, particularly, Bach, Mozart or the Italian musicians, most effectively increases the quality of life, improving health and, possibly prolongs life [42].

MT has been introduced in the Emergency Cardiology Department to reduce the possibility of alarm for hospitalized patients [43]. Selection of music most acceptable for the provision of therapeutic effects may depend on the patient's level of culture and musical preferences. Therefore, in the U.S., representatives of the white race preferred symphonic music, while those of the black race chose jazz [44].

A difficult problem for many people is the need to make changes in a few areas of their stereotypic lifestyles

associated with the presence of risk factors for CHD. MT improves the psychological state of such patients, reduces the severity of psychological stress as well as the severity of discomfort associated with dietary restrictions [45].

MT is widely available and can be performed at home. In many countries, health practices include specially designed programs of music therapy at home, contributing to the reduction of symptoms of depression and pain while it improves the quality of life of the patients [46].

Religion plays an important role in the lives of many people. From among the 455 older hospitalized Americans more than half (53.4%) reported that they attended religious services once a week or more and 58.7% pray and read the Bible everyday; more than 40% think that faith is the most important factor, which allows them to cope with difficult situations [47].

Oxman T.E. *et al.*, analyzed the results of the open heart operations in 232 elderly patients [48]. The result was that besides medical factors, the lack of religious support and facilities, and access to religion turned out to be a statistically significant predictor of the development of an unfavorable outcome in a period of six months post surgery. Patients with no access to the comfort of treatment with religion suffered a three-fold higher risk of death during the observation period.

The role of faith in medicine is challenging and unexplored. In the literature, not much data was found on research, from the perspective of evidence-based medicine, confirming the efficacy of religious activities in the treatment of human diseases. Nevertheless, it is obvious that the prayer strengthens the believer as the optimism propels them to recovery; this requires a doctor to respect the religious beliefs of the patient.

Data available in the modern literature suggest that some of the methods of CAM (yoga, tai chi, qigong, acupuncture therapy, music therapy) may be used besides the basic generally accepted methods of CR. Additional research is needed, the holding of RCTs for the accurate assessment of the usefulness and effectiveness of the application of the methods of CAM in CR.

## References

1. Uzun M. Patient education and exercise in cardiac rehabilitation. *Anadolu Kardiyol Derg* 2007; 7:298-304.
2. Kałka D, Sobieszcańska M, Pilecki W, Adamus J. Complex cardiac rehabilitation in a strategy of secondary prevention of cardiovascular disease. *Pol Merkur Lekarski* 2009; 157:30-5.
3. Lellamo F, Volterrani M. Cardiac rehabilitation. Recent advances. *Recenti Prog Med* 2010; 101:118-26.
4. Piepoli MF, Corrà U, Benzer W, Bjarnason-Wehrens B, Dendale P, Gaita D et al. Secondary prevention through cardiac rehabilitation: from knowledge to implementation. A position paper from the Cardiac Rehabilitation Section of the European Association of Cardiovascular Prevention and Rehabilitation. *Eur J Cardiovasc Prev Rehabil* 2010; 17:1-17.
5. Reeves GR, Whellan DJ. Recent advances in cardiac rehabilitation. *Curr Opin Cardiol* 2010; 25:589-96.
6. Blair J, Corrigall H, Angus NJ, Thompson DR, Leslie S. Home versus hospital-based cardiac rehabilitation: a

- systematic review. *Rural Remote Health* 2011; 11:1532
7. Neubeck L, Redfern J, Fernandez R, Briffa T, Bauman A, Freedman SB. Telehealth interventions for the secondary prevention of coronary heart disease: a systematic review. *Eur J Cardiovasc Prev Rehabil* 2009; 16:281-9.
  8. Scrutinio D. The potential of lifestyle changes for improving the clinical outcome of patients with coronary heart disease: mechanisms of benefit and clinical results. *Rev Recent Clin Trials* 2010; 5:1-13.
  9. Tachjian A, Maria V, Jahangir A. Use of herbal products and potential interactions in patients with cardiovascular diseases. *J Am Coll Cardiol* 2010; 55:515-25.
  10. Gabardi S, Munz K, Ulbricht C. A review of dietary supplement-induced renal dysfunction. *J Am Soc Nephrol* 2007; 2:757-65.
  11. Moquin B, Blackman MR, Mitty E, Flores S. Complementary and alternative medicine (CAM). *Geriatr Nurs* 2009; 30:196-203.
  12. Gilyarevsky SP. Efficacy of alternative and complementary therapy for cardiovascular disease: How evidence-based are the used interventions? *Heart* 2007; 6:322-32.
  13. Karpeev AA, Harisov NF, Chepkov VN. Traditional medicine abroad. *Traditional medicine* 2004; 2:4-10.
  14. Huber R, Koch D, Beiser I, Zschocke I, Luedtke R. Experience and attitudes towards CAM - a survey of internal and psychosomatic patients in a German university hospital. *Altern Ther Health Med* 2004; 10:32-6.
  15. Staud R. Effectiveness of CAM therapy: understanding the evidence. *Rheum Dis Clin North Am* 2011; 37:9-17.
  16. Atwood KC. Naturopathy: a critical appraisal. *Med Gen Med* 2003; 5:39.
  17. Mamtani R, Mamtani R. Ayurveda and yoga in cardiovascular diseases. *Cardiol Rev* 2005; 13:155-62
  18. Ernst E. Homeopathy: what does the "best" evidence tell us? *Med J Aust* 2010; 192:458-60.
  19. Sardinha A, Araújo CG, Soares-Filho GL, Nardi AE. Anxiety, panic disorder and coronary artery disease: issues concerning physical exercise and cognitive behavioral therapy. *Expert Rev Cardiovasc Ther* 2011; 9:165-75.
  20. Chong CS, Tsunaka M, Tsang HW, Chan EP, Cheung WM. Effects of yoga on stress management in healthy adults: A systematic review. *Altern Ther Health Med* 2011; 17:32-8.
  21. Pandya DP, Vyas VH, Vyas SH. Mind-body therapy in the management and prevention of coronary disease. *Compr Ther* 1999; 25:283-93.
  22. Pilkington K, Kirkwood G, Rampes H, Richardson J. Yoga for depression: the research evidence. *J Affect Disord* 2005; 89:13-24.
  23. Brown RP, Gerbarg PL. Yoga breathing, meditation, and longevity. *Ann N Y Acad Sci* 2009; 1172:54-62.
  24. Roland KP, Jakobi JM, Jones GR. Does yoga engender fitness in older adults? A critical review. *J Aging Phys Act* 2011; 19:62-79.
  25. Middlekauff HR. Acupuncture in the treatment of heart failure. *Cardiol Rev* 2004; 12:171-3.
  26. Wang H, Qi H, Wang BS, Cui YY, Zhu L, Rong ZX, Chen HZ. Is acupuncture beneficial in depression: a meta-analysis of 8 randomized controlled trials? *J Affect Disord* 2008; 111:125-34.
  27. Ades PA, Savage PD, Harvey-Berino J. The treatment of obesity in cardiac rehabilitation. *J Cardiopulm Rehabil Prev* 2010; 30:289-98.
  28. Church T. Exercise in obesity, metabolic syndrome, and diabetes. *Prog Cardiovasc Dis* 2011; 53:412-8.
  29. Cho SH, Lee JS, Thabane L, Lee J. Acupuncture for obesity: a systematic review and meta-analysis. *Int J Obes* 2009; 33:183-96.
  30. Jahnke R, Larkey L, Rogers C, Etnier J, Lin F. A comprehensive review of health benefits of qigong and tai chi. *Am J Health Promot* 2010; 24:1-25.
  31. Lan C, Chen SY, Wong MK, Lai JS. Tai Chi training for patients with coronary heart disease. *Med Sport Sci* 2008; 52:182-94.
  32. Yeh GY, Wang C, Wayne PM, Phillips R. Tai chi exercise for patients with cardiovascular conditions and risk factors: a systematic review. *J Cardiopulm Rehabil Prev* 2009; 29:152-60.
  33. Rogers CE, Larkey LK, Keller C. A review of clinical trials of tai chi and qigong in older adults. *West J Nurs Res* 2009; 31:245-79.
  34. Barrow DE, Bedford A, Ives G, O'Toole L, Channer KS. An evaluation of the effects of Tai Chi Chuan and Chi Kung training in patients with symptomatic heart failure: a randomized controlled pilot study. *Postgrad Med J* 2007; 83:717-21.
  35. Wang C, Bannuru R, Ramel J, Kupelnick B, Scott T, Schmid CH. Tai Chi on psychological well-being: systematic review and meta-analysis. *BMC Complement Altern Med* 2010; 10:23.
  36. Posadzki P, Parekh S, Glass N. Yoga and qigong in the psychological prevention of mental health disorders: a conceptual synthesis. *Chin J Integr Med* 2010; 16:80-6.
  37. Gabardi S, Munz K, Ulbricht C. A review of dietary supplement-induced renal dysfunction. *J Am Soc Nephrol* 2007; 2:757-65.
  38. Kennedy DA, Seely D. Clinically based evidence of drug-herb interactions: a systematic review. *Expert Opin Drug Saf* 2010; 9:79-124.
  39. Routledge PA. The European Herbal Medicines Directive: could it have saved the lives of Romeo and Juliet? *Drug Saf* 2008; 31:416-8.
  40. Bradt J, Dileo C. Music for stress and anxiety reduction in coronary heart disease patients. *Cochrane Database Syst Rev* 2009 Apr 15; (2):CD006577.
  41. Okada K, Kurita A, Takase B, Otsuka T, Kodani E, Kusama Y et al. . Effects of music therapy on autonomic nervous system activity, incidence of heart failure events, and plasma cytokine and catecholamine levels in elderly patients with cerebrovascular disease and dementia. *Int Heart J* 2009; 50:95-110.
  42. Trappe HJ. The effects of music on the cardiovascular system and cardiovascular health. *Heart* 2010; 96:1868-71.
  43. Bolwerk CA. Effects of relaxing music on state anxiety in myocardial infarction patients. *Crit Care Nurs Q* 1990; 13:63-72.
  44. Good M., Picot BL, Salem SG. Cultural differences in

- music chosen for pain relief. *J Holist Nurs* 2000; 18:245-260.
45. Marconato C, Munhoz EC, Menim MM, Albach MT. Application of receptive music therapy in internal medicine and cardiology. *Arq Bras Cardiol* 2001; 77:138-41.
46. Schmid W, Ostermann T. Home-based music therapy – a systematic overview of settings and conditions for an innovative service in healthcare. *BMC Health Serv Res* 2010; 10:291.
47. Koenig HG. Religious attitudes and practices of hospitalized medically ill older adults. *Int J Geriatr Psychiatry* 1998; 13:213-24.
48. Oxman TE, Freeman DH. Jr, Manheimer ED. Lack of social participation or religious strength and comfort as risk factors for death after cardiac surgery in the elderly. *Psychosom Med* 1995; 57: 5-15.