Complementary Therapies in Clinical Practice 20 (2014) 42–47

Contents lists available at ScienceDirect

Complementary Therapies in Clinical Practice

journal homepage: www.elsevier.com/locate/ctcp

The effects of foot reflexology massage on anxiety in patients following coronary artery bypass graft surgery: A randomized controlled trial

Masoumeh Bagheri-Nesami [a], Seyed Afshin Shorofi [a,b], Nahid Zargar [c], Maryam Sohrabi [d,*], Afshin Gholipour-Baradari [e], Alireza Khalilian [f]

[a] Department of Medical-Surgical Nursing, School of Nursing and Midwifery, Mazandaran University of Medical Sciences, Sari, Iran
[b] Traditional and Complementary Medicine Research Centre, Mazandaran University of Medical Sciences, Sari, Iran
[c] School of Nursing and Midwifery, Mazandaran University of Medical Sciences, Sari, Iran
[d] Ayatollah Rohani Hospital, Babol University of Medical Science, Babol, Iran
[e] Department of Anesthesiology, Imam Khomeini Hospital, Mazandaran University of Medical Science, Sari, Iran
[f] Department of Biostatistics and Epidemiology, Psychiatry & Behavioral Sciences Research Centre, Mazandaran University of Medical Sciences, Sari, Iran

Keywords:
Foot reflexology massage
Anxiety
Coronary artery bypass graft

A B S T R A C T

Objective: To examine the effects of foot reflexology massage on anxiety in patients following CABG surgery.
Methods: In this randomized controlled trial, 80 patients who met the inclusion criteria were conveniently sampled and randomly allocated to the experimental and control groups after they were matched on age and gender. On the days following surgery, the experimental group received foot reflexology massage on their left foot 20 min a day for 4 days, while the control group was given a gentle foot rub with oil for one minute. Anxiety was measured using the short-form of the Spielberger State-Trait Anxiety Inventory and the Visual Analogue Scale-Anxiety.
Results: Both measurement instruments confirmed a significant decrease in anxiety following the foot reflexology massage.
Conclusion: The significant decrease in anxiety in the experimental group following the foot reflexology massage supports the use of this complementary therapy technique for the relief of anxiety.

1. Introduction

Coronary artery bypass graft (CABG) is a surgical procedure performed to relieve angina [1]. CABG is widely performed worldwide, with an estimated 686000 CABG surgeries performed annually in the United States. In Australia, over 20000 CABG operations are performed annually [2]. Surgery can potentially bring about a lot of stress for patients, who have near no control over the event and its outcomes. It has been shown that major surgeries induce more profound physiological changes than minor surgeries [1,3].

There are several factors relating to cardiac surgery-induced anxiety, these including severe chest pain and consequent fatigue, fear of death, disability, and persistent symptoms despite surgery [4]. If the anxiety stays at a high level for a prolonged period of time, it may have deleterious effects on body, mind and interpersonal relationships. Long-term, severe anxiety is generally accompanied by physiological responses such as increased metabolism, impaired cardiovascular and gastrointestinal functions and a weakened immune system [5] as well as delayed wound healing and increased plasma levels in corticosteroids [6]. These responses can consequently lead to muscle tension, exhaustion, rapid heartbeat, breathing difficulties, high blood pressure, rapid changes in body temperature and even death [7,8]. Anxiety-induced hypertension, if left untreated, may increase the risk of oozing or bleeding from suture lines and even the rupture of graft anastomosis after CABG surgery [9].

In the recent years, an emphasis has been placed on non-pharmacological methods to reduce or eliminate anxiety. Non-pharmacological methods comprise of a wide range of techniques that are relatively simple, noninvasive, low-cost and with fewer side effects than pharmacological methods [10]. Foot reflexology massage is one of these non-invasive methods, one which exerts pressure on the certain points on the feet [11].

Foot reflexology massage is based on the notion that it stimulates energy flow within the body from the feet to the head, which

* Corresponding author. Tel.: +98 151 2267342; fax: +98 151 2268915.
E-mail addresses: anna3043@gmail.com (M. Bagheri-Nesami), ashorofi@yahoo.com (S.A. Shorofi), zar200777@yahoo.com (N. Zargar), sohraby.maryam@gmail.com (M. Sohrabi), gholipourafshin@yahoo.com (A. Gholipour-Baradari), khalilianir@yahoo.com (A. Khalilian).

1744-3881/$ – see front matter
http://dx.doi.org/10.1016/j.ctcp.2013.10.006

can decrease sympathetic nervous system arousal, relieve anxiety and promote relaxation [12]. Recent systematic reviews of the effectiveness of reflexology in patients with cancer found positive improvements in anxiety and pain [13–15].

Given the importance of preventing postoperative complications and the unwanted effects of pharmaceuticals extensively used for these complications, complementary and alternative medicine (CAM) has increasingly become a popular option for cardiac surgery patients. Classified as a mind and body practice [16], foot reflexology massage is a CAM treatment that has proved to be a beneficial therapeutic method. However, there is a dearth of research relating to the effects of foot reflexology massage on anxiety in cardiac surgery patients [2,6]. Furthermore, existing studies have led to conflicting results concerning the effectiveness and therapeutic benefits of foot reflexology on anxiety in cardiac surgery patients [12,17]. This study was designed to determine the effects of foot reflexology massage on anxiety in patients who have undergone CABG surgery.

2. Methods

2.1. Sampling

In this randomized controlled trial, 80 patients who met the inclusion criteria were conveniently sampled and randomly allocated to experimental and control groups after they were matched on age and gender. The sample size was calculated according to a similar study by Sadeghi et al. (2010) [18] with the confidence coefficient of 95%. All CABG surgery patients were recruited from the Mazandaran Heart Centre, Sari, Iran.

2.2. Inclusion criteria

Patients were included if they met the following criteria:

- Willing to participate in the study
- First non-emergency cardiac surgery
- Cardiac surgery using a heart–lung machine.

2.3. Exclusion criteria

Patients were excluded if they met one of the exclusion criteria:

- Lack of consciousness
- Need for an intra-aortic balloon pump
- Tracheal intubation for more than 24 h
- Bleeding >200 mL per hour via a chest tube
- Heart valve repair or replacement during CABG surgery
- Severe visual and hearing impairments
- History of chronic pain
- Alcohol and drug addiction
- Fractured bones, skin grafts, sensory impairments, skin infections, and skin ulcers on the left leg.

2.4. Measurement instruments

Socio-demographic data were recorded by means of a researcher-constructed questionnaire. Anxiety was measured using a short-form of the Spielberger State-Trait Anxiety Inventory (STAI) and a Visual Analogue Scale-Anxiety (VAS-A). The STAI is one of the most reliable and sensitive measures and the VAS-A is one of the most commonly used instruments to measure anxiety. To less disturb the cardiac surgery patients who needed to rest several days postoperatively, a short-form of the STAI was used to measure anxiety. We applied the use of two anxiety measurement instruments to yield more accurate results.

2.4.1. VAS-A

The VAS-A consists of a 10 cm horizontal line, graded from zero to ten [19]. Zero represents 'no anxiety' and ten 'worst anxiety imaginable'. As a valid, reliable and sensitive instrument, VSA-A provides a precise measurement of anxiety [2,12].

2.4.2. Short-form of STAI

The short-form version of the STAI used in this study consists of six items, developed from the full-form scale. Respondents can rate themselves on each item on the basis of a 4-point Likert scale (*not at all*, *somewhat*, *moderately*, *very much*). Correlation coefficients between each of the short-form and full-length scale has been calculated as 96%. The short-form version of the instrument has the same factor structure of the full-form scale. The possible points range from 6 to 24, categorized as *mild* [6–11], *moderate* [12–17] and *severe* [18–24] [20]. The short-form of the STAI is also reported to have optimal validity and reliability [21].

2.5. Procedure

The cardiac surgery waiting lists were regularly checked at the Mazandaran Heart Center to identify the patients who fulfilled the inclusion criteria. The eligible participants were verbally provided with a brief description of the purpose and value of the study to gain the initial interest of participants. The eligible participants were then given an opportunity to ask questions and seek clarification about the study. When each participant was informed and satisfied about the requirements of the study and agreed to attend by signing a consent form, they were randomly allocated to the experimental and control groups (See consort follow chart).

The first study subject was asked to draw from two cards labeled *control group* and *experimental group*. Upon choosing the control group, the remaining participants were assigned to the two gender- and age-matched groups. For instance, if the first patient in the control group was a 65-year-old man, the next patients allocated to the experimental or control groups were consecutive age- and gender-matched.