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Effects of music therapy on pain, anxiety, and vital signs in patients after thoracic surgery

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ABSTRACT

Objective: To examine the effectiveness of music listening on pain, anxiety, and vital signs among patients after thoracic surgery in China.
Design and setting: A randomized controlled clinical trial was conducted in the thoracic surgery department of two tertiary hospitals in Wuhan, China. 112 patients were recruited and randomly assigned to either experimental ($n = 56$) or control ($n = 56$) group respectively.
Intervention: The experimental group received standard care and a 30-min soft music intervention for 3 days, while the control group received only standard care. Measures include pain, anxiety, vital signs (blood pressure, heart rate and respiratory rate), patient controlled analgesia, and diclofenac sodium suppository use.
Results: The experimental group showed statistically significant decrease in pain, anxiety, systolic blood pressure and heart rate over time compared to the control group, but no significant difference were identified in diastolic blood pressure, respiratory rate, patient controlled analgesia and diclofenac sodium suppository use.
Conclusion: The findings provide further evidence to support the practice of music therapy to reduce postoperative pain and anxiety, and lower systolic blood pressure and heart rate in patients after thoracic surgery in China.

1. Introduction

Thousands of patients undergo surgery everyday throughout the world and experience pain.[1] Postoperative pain, a kind of acute pain, is an anticipated but unwanted outcome of all surgeries.[2] Pain after thoracotomy is a severe acute traumatic pain resulting from incision[3] and has been reported to be a most painful clinical experience.[4] Literature yielded that postoperative pain in patients undergoing thoracotomy is still an important problem attracts attention of numerous studies.[5]

Anxiety usually accompanies pain,[6] patients have a high level of anxiety when they are in the hospital.[7] Anxiety is a psychological disorder that can cause many adverse effects. Patients may experience fatigue, have difficulty sleeping and digesting, lose appetite and weight, have elevated heart rate, develop more stress, feel helpless and pessimistic, lose confidence to fight against disease, all are adverse effect that harm the patient and delay their recovery.[8,9] Thus much more attention is required to find an effective way to reduce patient anxiety.[7]

Music therapy as a nonpharmacological adjuvant has been widely used in clinical practice.[10] In 2005, the American Music Therapy Association defines music therapy as "music interventions that are both clinically and evidence- based. The goal of music interventions by nurses or therapists, educated in an approved music therapy program is to develop a therapeutic relationship". Music therapy can be implemented as a nursing procedure.[11] Research determined that listening to music can increase comfort and relaxation, relieve pain, lower distress, reduce anxiety, improve positive emotions and mood, and decrease psychological symptoms.[8,12–14]

Although there are growing studies of music therapy in China in recent years, the quantity and quality of the studies are sparse and inadequate,[15] and inconsistent findings were reported. This study was conducted to investigate the effectiveness of music on patients' postoperative pain, anxiety, and vital signs after thoracic surgery and to provide further evidence to support the practice of music therapy for patients in China.

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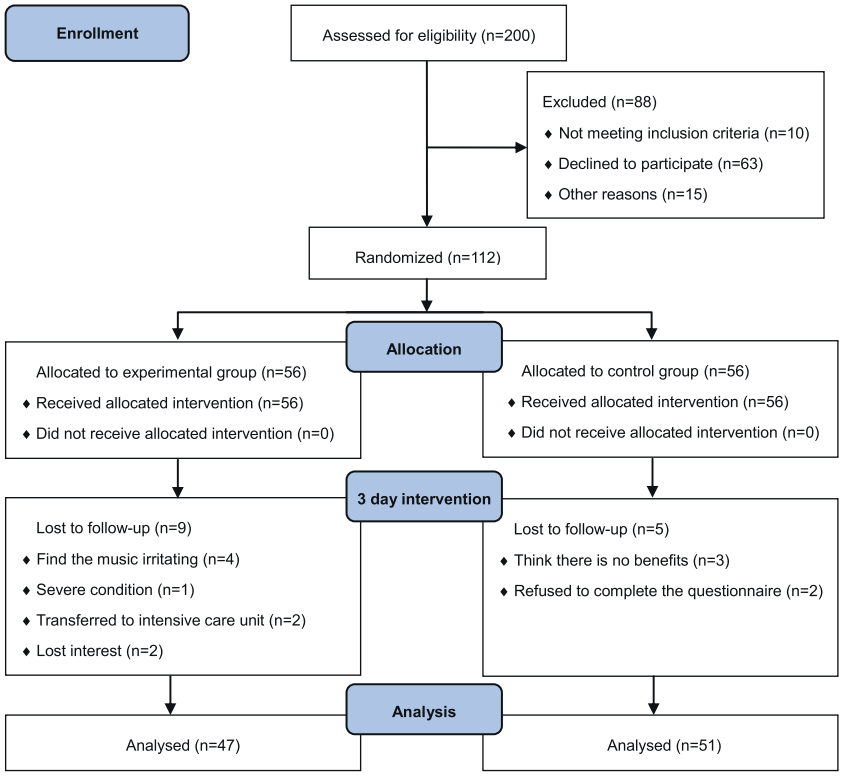

Figure.1 Flowchart of the study.

Fig. 1. Flowchart of the study.

2. Methods

2.1. Study design and participants

A randomized controlled trial with repeated measures design (Fig. 1). The experimental group received a 30-min music intervention for three days plus standard care while the control group received only standard care. Two tertiary hospitals in Wuhan, China, provided the setting from November 2013 to March 2014 for the clinical trial.

A convenience sample of 112 patients was recruited. Inclusion criteria for participants included: (a) inpatients scheduled for thoracic surgery; (b) aged 18 or older; (c) able to understand, read and speak Chinese, so they may complete the informed consent and questionnaires; (d) conscious, oriented to person, place, time and situation. Patients with vision and hearing deficits and inability to complete questionnaires, not willing to participate, or underwent emergency surgeries were excluded.

2.2. Randomization and sample size

Participants with odd admission day numbers were assigned to the experimental group while those with even numbers were assigned to the control group. There was no blinding as the researcher and participants knew the allocation.

The sample size was determined with GPower3.1.9.[16] Alpha value was set at 0.05 and a power of 0.95; the resulting minimum sample size was 92 patients. Considering an attrition rate of 20%, therefore the total sample size required was 112 subjects.

2.3. Measurements

The pain was measured using faces pain scale.[17] Patients can choose the face that best represents their pain intensity ranging from "no hurts" to "hurts the worst". Although faces pain scale is widely used to assess children's pain, a study determined it was the most accurate, easy to understand, and with highest response rate among five commonly used pain scales in patients with vascular surgery.[18] The faces pain scale has a strong positive correlation with other pain scales ($r = 0.81–0.95$; $p < 0.001$), and it is valid, reliable and easy to use for clinical pain assessment of mature adults or very ill patients.[19]

The state-trait anxiety inventory (STAI) is widely used for measuring anxiety. It has 20 items for state anxiety; all items are rated on a 4-point scale from "1 = almost never" to "4 = almost always". Higher scores indicate higher anxiety level, low anxiety ranges from 20 to 39, the moderate anxiety ranges from 40 to 59, and high anxiety ranges from 60 to 80.[7] The STAI's internal consistency coefficients have ranged from 0.86 to 0.95 with test-retest reliability coefficients ranging from 0.65 to 0.75.[20] STAI is also used expansively in Chinese populations[21,22] and has been applied to many studies, the test-retest coefficient of SAI is 0.88.[23]

Vital signs (systolic blood pressure [SBP], diastolic blood pressure [DBP], heart rate [HR], and respiratory rate [RR]) were measured at each test point. Patient controlled analgesia (PCA) use was counted, and the consumption (mg) of diclofenac sodium suppository (DSS) use was recorded each day for three days. A survey was also conducted with the music group to ascertain participants' opinions of the music intervention.

2.4. Procedures

After ethical approval was obtained, the researcher invited eligible patients, introduced the study protocol to them, had the informed consent signed, asked participants