Available online at www.sciencedirect.com

ScienceDirect

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

Effect of music intervention on burn patients' pain and anxiety during dressing changes

Kuo-Cheng Hsu *, *Li Fen Chen*, *Pi Hsia Hsiep*

Linkou Chang Gung Memorial Hospital Burn Center, Taiwan, ROC

ARTICLE INFO

Article history:
Accepted 12 May 2016

Keywords:
Burns
Music intervention
Pain
Anxiety

ABSTRACT

For burn patients, the daily dressing process causes pain and anxiety. Although drugs can relieve them, the degree of pain during dressing changes is often moderate to severe. Therefore, relevant supporting interventions, like music as an ideal intervention, could alleviate the patient's pain.

This study investigated the impact of music intervention at dressing change time on burn patients' pain and anxiety. This was a prospective, randomized clinical trial; patients were randomly assigned into control (standard intervention) and experimental groups (crystal music intervention) for five consecutive days (35 patients in each group). Patients' pain and anxiety measurements were collected before, during, and after dressing changes and morphine usage was recorded. The study period was October 2014 to September 2015. There was no difference in morphine dosage for both groups. By the fourth day of music intervention, burn patients' pain before, during, and after dressing changes had significantly decreased; anxiety on the fourth day during and after dressing changes had also significantly decreased.

Nurses may use ordered prescription analgesics, but if non-pharmacological interventions are increased, such as providing timely music intervention and creating a friendly, comfortable hospital environment, patients' pain and anxiety will reduce.

1. Introduction

Management of pain caused by burns has always been a challenging issue. Burn patients in the acute through rehabilitation phases will experience background pain at rest, procedural pain during dressing changes, and breakthrough pain during rehabilitation [1,2]. Among these, daily dressing changes are a main source of pain [3]; however, anxiety also has a negative interaction with the pain by increasing its intensity and reducing medication's therapeutic effects [2,4]. The degree of pain in burn patients resulting from dressing changes is moderate to severe. To alleviate pain and anxiety, medication can be used; however, nurses often overestimate the degree of pain patients endure or fear medication side effects and give a lower dose [5]. Every patient's pain relief needs may not be satisfied; non-pharmacological clinically assistive care approaches are also rare.

ICU patients are often in critically ill or unstable condition; nurses prioritize dealing with their health and abnormal pathology and neglect spiritual or emotional care. However, music intervention has been widely used in the care of various

* *Corresponding author at*: Linkou Chang Gung Memorial Hospital Burn Center, No. 5, Fuxing St., Guishan Dist., Taoyuan City 333, Taiwan, ROC.
E-mail addresses: email@cgmh.org.tw (K.-C. Hsu), Lifen1561@yahoo.com.tw (L.F. Chen), Pihsia406@cgmh.org.tw (P.H. Hsiep).

Abbreviation: NRS, numeric rating scale.

http://dx.doi.org/10.1016/j.burns.2016.05.006

diseases, including examination and postoperative patients. Research on reducing anxiety, pain, and stress, improving behavior problems and hospital quality of life, and reducing physical, emotional, and mental disorder-related symptoms and syndromes have shown a certain degree of positive effects; a considerable effect in stabilizing vital signs has been found [3,6–10].

Music has multiple aspects. It can evoke experiences with physical, cognitive, and emotional aspects. Music listening can improve mood, reduce anxiety, and transfer pain and unpleasant feelings [4,11]. In evidence-based nursing, music listening is an effective nursing intervention to promote comfort and wound healing [12]. Pain has both sensory-discriminative and affective-motivation aspects [11]. Pharmacologic and non-pharmacologic treatment can be combined to achieve clinical pain relief. In the sensory-discriminative aspect, pain due to actual or potential tissue damage elicits an unpleasant feeling along with a negative emotional experience [9].

A group of nerves located in the dorsal horn of the spinal gray matter suppresses pain. When the pain from nerve signals pass receivers transmitted to gray matter in the spinal cord dorsal horn synapses, they act as a gate. They may close or open to allow impulses to upload to the brain, thereby resulting in pain; this is called the gate control theory [6,9,13].

Listening to music can provide competitive sensory stimulation input, causing nerve impulses to close the gate to increase the pain threshold and decrease pain signals transmitted to the brain, thereby reducing the pain experience. Distraction or learned behavior applies the gate control theory; music can attract their attention, reduce pain or exhaustion of the reaction, and redistribute the pain and anxiety [14,15].

In the affective-motivation aspect, musical tones and melodies can cause vibrations to affect the hypothalamus and reticular activating system interaction. This stimulates emotions and affects autonomic nervous system and muscular system function. When accompanied by musical tone adjustment, rhythm can cause physiological changes in blood pressure, heart rate, and respiratory rate [4,6]. When music stimulates the hypothalamus and the limbic system, the generated imagery stimulates autonomic nervous reactions and the spread of nerve impulses to the midbrain and higher centers stimulates endorphin secretion; this offsets negative emotions, elicits feelings of pleasure, and reduces pain [6,12,13,16].

Smooth flowing music, lyrical melody, simple chords, soft tone, and rhythm tempo of 60–80 beat/min music (equivalent to the normal heart rate and physiological effects of the typical adult) can produce relaxed mood and reactions, thereby inhibiting or offsetting pain and promoting emotional self-regulation [4,5,8,9,16]. Music has simple, low cost, low risk, non-invasive, and non-pharmacological characteristics easily accepted by the public [1,5,17]. Clinically, nurses are the first line of patient contact. Nurses are responsible for dressing changes and pain management. Nurses may use ordered prescription analgesics, but if non-pharmacological interventions, such as providing timely music intervention and creating a friendly, comfortable hospital environment are increased, patients' pain and anxiety will reduce [18]. This study investigated the impact of music interventions before, during, and after dressing changes on burn patients' pain and anxiety. We expected to provide patients with non-pharmacological methods to alleviate pain and anxiety.

2. Method

2.1. Sample

This study was a prospective randomized clinical trial. The study samples were collected from Chang Gung Memorial Hospital Burn Center, Taiwan (ROC). The research time was from October 2014 to September 2015. The inclusion criteria were (a) burns within 24 h of hospitalization and age over 18 with an expected stay in the hospital of more than seven days; (b) able to communicate clearly with no hearing impairment; (c) no acute or chronic psychiatric disorders, hallucinations, delirium, Alzheimer's disorders, drug addiction, or abuse; (d) non-critical condition without the use of a ventilator; and (e) no music therapy experience. The Linkou Chang Gung Memorial Hospital Institutional Review Board provided written approval of this study, and all enrolled patients provided informed consent.

2.2. Music intervention

In this study, crystal music was used as a music intervention. Crystal music originated as crystal piano playing music with a clear and bright sound quality. It sounds similar to the sound of glass or crystal colliding. This study used crystal music that is sold in the market, including content from genres such as classical and pop music. After discussion, the researchers selected a crystal music compact disc (CD) for the experimental group of patients' listening during dressing change time. Before dressing changes in the experimental group, the CD player was placed on bedside tables, with speaker playback and volume set to 60 dB [8], every morning 15 min before dressing changes started until 30 min after dressing changes.

2.3. Measurements

In this study, a numeric rating scale (NRS) of 0–10 points measured the pain intensity and anxiety level, respectively; 0 represented no pain or anxiety and 10 represented unbearable pain or anxiety. NRS as pain or anxiety assessment tools have been used in many articles with confirmed good reliability and validity [4,8,9,17–19].

2.4. Procedure

Hospitalized patients with burns meeting the criteria met with the study research moderator or co-moderators. They discussed the research purposes and allowed dropouts. After respondents consented, the researchers drew lots randomly. Yellow and white table tennis balls were placed in a covered box; yellow represented the experimental group and white represented the control group. Participants were assigned accordingly. Then, basic patient information and demographic data were collected. On the second hospitalized day, the