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Can live music therapy reduce distress and pain in children with burns after wound care procedures? A randomized controlled trial

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ABSTRACT

Objective: Burn wound care procedures are very painful and lead to distress. Live music therapy has shown beneficial effects on distress and pain in specific pediatric patient populations. In this study we measured whether live music therapy has beneficial effects in terms of less distress and pain in children with burns after wound care procedures.

Methods: This randomized assessor-blinded controlled trial (RCT) took place at the burns unit of the Red Cross War Memorial Children's Hospital, Cape Town, South Africa. It included newly admitted inpatients between the ages of 0 and 13 years undergoing their first or second wound care procedures. Excluded were children with a hearing impairment or low level of consciousness. The intervention group received one live music therapy session directly after wound care in addition to standard care. The control group received standard care only. The primary outcome was distress measured with the Observational Scale of Behavioral Distress-revised (OSBD-r). The secondary outcome was pain measured with the COMFORT-behavioral scale (COMFORT-B). In addition, in children older than 5 years self-reported distress with the validated Wong-Baker scale (FACES) and pain with the Faces Pain Scale-Revised (FPS-R) were measured. Patients in both groups were videotaped for three minutes before wound care; during the music therapy or the control condition; and for two minutes thereafter. Two researchers, blinded to the study condition, independently scored the OSBD-r and the COMFORT-B from the video footage before and after music therapy.

Abbreviations: WCP, wound care procedures; RCWMCH, Red Cross War Memorial Children's Hospital; OSBD-r, Observational Scale Behavioral Distress; COMFORT-B, COMFORT behavioral scale.

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Results: We included 135 patients, median age 22.6 months (IQR 15.4-40.7 months). Change scores did not significantly differ between the intervention and the control groups for either distress ($p=0.53$; $d=0.11$; 95% CI -0.23 to 0.45) or pain ($p=0.99$; $d=0.04$; 95% CI -0.30 to 0.38). Self-reported distress in a small group of children ($n=18$) older than 5 years indicated a significant reduction in distress after live music therapy ($p=0.05$).

Conclusions: Live music therapy was not found effective in reducing distress and pain in young children after burn wound care. Older children might be more responsive to this intervention.

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1. Introduction

Hospitalized children with burns may experience severe pain, distress, acute stress, and posttraumatic stress disorder as a result of painful medical procedures such as surgery, wound care procedures (WCP) and rehabilitation therapy [1-3]. Distress has been defined as behaviors of negative affect associated with pain, anxiety and fear [4]. Distress is intrinsically linked with pain intensity and should be limited as best as possible as it can affect a child's pain perception and pain processing later in life [4-8]. Burns pain is experienced differently per person, irrespective of the nature and size of the burn. Furthermore, the pain experience changes over time as the damaged tissue regenerates. Apart from physiological changes, psychological and environmental factors such as context (expectations and past experiences), cognition (distraction and self-belief) and mood (depression and anxiety) also determine the pain perception [3]. Therefore it is important to provide both pharmacological and psychological support around painful procedures. In particular WCPs are painful and distressing as they involve removal of bandage; cleaning the wound; administering new wound care products; and putting on new dressings [9-11].

Several studies on pain and distress in hospitalized children suggest the benefits of offering psychological interventions before, during and after painful procedures [12,13]. In burns, some of the current coping strategies to tolerate WCPs include preparing the patient before the procedure and applying distraction and relaxation techniques such as music listening [14-18].

Music interventions can consist of listening to pre-recorded music or live music therapy from a trained music therapist. Live music therapy aims, amongst other things, to help children distract and cope with being in an unfamiliar environment; provide a space for emotional expression; allowing them to have a sense of control by being able to choose an instrument to play with; and assist in inducing a state of relaxation [19]. A music therapist engages with the patient by making live music, playing an instrument together or improvising using the voice and instruments [20]. Live music therapy focuses on the creation of the music experience and the emotional impact music can have such as changing or releasing emotions, bringing comfort, inducing relaxation and providing distraction [21,22]. Furthermore, music stimuli are thought to influence the limbic system: the part of the brain that controls the areas of memory, emotions, and the release of

neuropeptides such as dopamine, which in turn influences pain and distress experiences [23-26].

In the burns unit of the Red Cross War Memorial Children's Hospital in Cape Town, South Africa, a music therapist routinely provides live music therapy during the day in order to distract and bring comfort to the children. In this setting it is not possible to perform music therapy during the WCP. Therefore we performed a study to determine whether live music therapy directly after WCP could be beneficial in reducing children's distress and pain. To our knowledge no studies have assessed the effects of live music therapy after WCP in children.

2. Material and methods

2.1. Design

In this randomized assessor-blind controlled trial (RCT) children with burns were randomly assigned to either of two study arms: a single live music therapy session offered after wound care or standard care as control condition.

2.2. Setting and participants

This study took place at the pediatric burns unit of the Red Cross War Memorial Children's Hospital (RCWMCH) in Cape Town, South Africa from October 2014 to November 2015. The RCWMCH is a state hospital that admits children aged from 0 to 13 years. The families speak either isiXhosa, Afrikaans or English.

Eligible patients were inpatients receiving their first or second WCP, which is usually on post-burn day 1 or 2, because most children would receive their third WCP in a different ward in the hospital. Children with a hearing impairment or low levels of consciousness (children who were unable to communicate because of the sedatives they had received or children who were asleep) were excluded. The medical ethical committee of the University of Cape Town and the medical ethical committee of the RCWMCH approved the study. This RCT was registered at the Pan African Clinical Trials Registry number PACTR201505000906290. The measurements of distress and pain during WCP were published elsewhere [27].

2.3. Interventions

Live music therapy was given directly after the WCP at the bedside by one of three certified music therapists (members of

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