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Assessing and addressing the problem of pain and distress during wound care procedures in paediatric patients with burns

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ABSTRACT

Objective: While the prevalence of burns in children is highest in low and middle-income countries, most research on burn-related pain intensity and distress is carried out in high-income countries. In this study we assessed pain intensity and distress in paediatric patients with burns undergoing wound care procedures without distraction and parental presence in a South-African children's hospital and sought to identify predictors for the outcomes.

Methods: This observational study, carried out as part of a randomized controlled trial, took place at a burns unit in Cape Town, South Africa and included patients between the ages of 0 and 13 years undergoing their first or second wound care procedure. We measured pain intensity and distress using the COMFORT Behavioural scale (COMFORT-B) across four distinct phases of wound care procedures: removal of bandage; washing the wound; administering wound care; putting on new dressings. COMFORT-B scores ≥ 21 indicate severe pain intensity and distress.

Results: 124 patients were included, median age 21.2 months (IQR 14.9-39.5 months), 90% suffered scalds, and median total body surface 8% (IQR 5-14%). Assessment scores for the majority of patients were indicative of severe pain intensity and distress during wound care procedures. Median COMFORT-B scores across the four phases were 24, 25, 25 and 22 respectively. Across the four phases respectively 76%; 89%; 81% and 62% of the patients were indicated with severe pain intensity and distress. Age was a predictor for pain intensity and distress as younger children were assigned higher scores than older children (Unstandardized B -0.052 ; 95% CI -0.071 to -0.032 $p < 0.001$).

Conclusions: In this study children received wound care procedures without distraction or parental presence and were assessed to have high pain intensity and distress. There is a

Abbreviations: WCP, wound care procedures; RCWMCH, Red Cross War Memorial Children's Hospital; COMFORT-B, COMFORT Behavioural scale.

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correlation between age and COMFORT-B scores: younger children show higher distress, indicating a great need for better pain and distress control during wound care procedures. It is difficult to identify whether pain or distress is the specific primary cause for the high COMFORT-B scores.

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1. Introduction

Burns are associated with painful and distressing experiences due to the trauma of the injury, hospitalization and medical procedures. Pain experiences are shaped by a constant background pain caused by the inflammatory response in and around the burn site; and by acute intense procedural pain caused by manipulation of the burned area [1,2]. Moreover, burns have been linked to acute and posttraumatic stress disorder [3-6]. Distress has been defined as 'behaviours of negative affect associated with pain, anxiety and fear' [7]. In children with burns, pain intensity and pain-related distress are intrinsically connected [1,8]. Inadequate pain management might evoke a distress response, arousal for subsequent procedures, and can influence the child's pain perception and processing in later life [9-11].

Treatment of burn involves repeated wound care procedures (WCP), which are painful and frightening [12]. Four phases of WCP can be distinguished: removal of the bandage, cleaning the wound (including wiping away loose skin with gauze swabs), administering new wound care products and putting on new dressings. When children have negative emotions such as distress or anger they may perceive the pain as more intense [13,14]. Therefore it is important to support the child in coping with pain and distress of the recurring WCP.

When children cannot self-report pain intensity and distress the use of behavioural observation scales is indicated, such as the COMFORT-behaviour scale (COMFORT-B) [1]. A study by de Jong et al. using the COMFORT-B to determine the extent and course of background and procedural pain in children in a high-resource burns unit showed that 66% of the children expressed moderate and 25% severe procedural pain intensity [8].

To our knowledge there is no baseline measurement of pain and distress during WCP in children from resource-limited settings. Therefore the aim of this observational study was to assess the extent of pain intensity and distress in children in South Africa during a standard WCP, without distraction interventions or parental presence. Furthermore we studied whether patient characteristics, pharmacological treatment and type of wound care product predicted the level of pain intensity and distress.

2. Material and methods

2.1. Design

This observational study measured the levels of pain intensity and distress in children with burns during WCP. This study

was carried out as part of a randomized controlled trial (RCT) that measured the effects of live music therapy on pain and distress after WCP, comparing pain and distress scores before the WCP and music intervention to after the music intervention.

2.2. Setting and inclusion criteria

This study took place at the paediatric burn unit of the Red Cross War Memorial Children's Hospital (RCWMCH) in Cape Town, South Africa from October 2014 to November 2015 (RCT registered at the Pan African Clinical Trials Registry number PACTR201505000906290). The medical ethical committee of Cape Town University and the medical ethical committee of the RCWMCH approved the study.

The RCWMCH is a state hospital and most of its patients come from poor backgrounds. The burn unit has 17 beds, including 6 high care beds, and has access to intensive care facilities. Annually, around 1300 patients are admitted to the ward and approximately 5000 patients visit the outpatient burn clinic. Children from age 0 to 13 are admitted; 70% are younger than 6 years old (RCWMCH Information Management Department). Criteria for admission are a full thickness burn greater than 5% of the total body surface area (%TBSA), partial thickness burns >10% TBSA and/or burns involving inhalation, electrical injuries, face, hands, perineum, genitalia, or body circumference, associated trauma or suspected child abuse.

Eligible subjects included newly admitted inpatients of all ages receiving their first or second WCP after admission. For practical reasons we could only include children who received WCP in the morning. Excluded were children newly admitted but receiving WCP in the afternoon of the day of admission. Furthermore, children with a hearing impairment or altered level of consciousness were excluded.

2.3. Outcome measurements

Outcome variables were pain intensity and distress during WCP, measured with the COMFORT-B scale. This scale has been found a reliable, valid and practical tool to measure background and procedural pain and distress behaviour in children with burns aged 0-5 years [1,15]. It has been validated for the use in various paediatric patient groups such as critically ill, mechanically ventilated and mentally impaired children. Although officially validated for children up to 7 years old, the COMFORT-B is used for children up to 18 years old [16]. The COMFORT-B has been validated cross-culturally in European countries, the USA and in Chinese and Portuguese speaking populations [17-19]. It asks observers to consider intensity of six behavioural manifestations: alertness, calmness, crying, body movement, facial tension and muscle tone.

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