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Computer tablet distraction reduces pain and anxiety in pediatric burn patients undergoing hydrotherapy: A randomized trial

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ABSTRACT

Background: Distraction is often used in conjunction with analgesics to minimize pain in pediatric burn patients during treatment procedures. Computer tablets provide many options for distraction items in one tool and are often used during medical procedures. Few studies have examined the effectiveness of tablet distraction in improving the care of pediatric burn patients.
Aim: This study examines the effectiveness of tablet distraction provided by a child life specialist to minimize pain and anxiety in pediatric burn patients undergoing hydrotherapy.
Methods: Thirty pediatric patients (4–12) undergoing hydrotherapy for the treatment of burns participated in this randomized clinical trial. The tablet distraction group received tablet distraction provided by a child life specialist while those in the control group received standard care. Pain was assessed through self-reports and observation reports. Anxiety was assessed through behavioral observations. Length of procedure was also recorded.
Results: Nurses reported significantly less pain for the tablet distraction group compared to the control group. There was no significant difference between groups on self-reported pain. The tablet distraction group displayed significantly less anxiety during the procedure compared to the control group. Also, the tablet distraction group returned to baseline after the procedure while those in the control group displayed higher anxiety post-procedure. There was no difference in the length of the procedure between groups.
Conclusions: These findings suggest tablet distraction provided by a child life specialist may be an effective method for improving pain and anxiety in children undergoing hydrotherapy treatment for burns.

Abbreviations: TBSA, total body surface area affected; MMD, multi-modal distraction; IV, intravenous; CEMS, children's emotional manifestation scale; CCLS, Certified Child Life Specialist.

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1. Introduction

Pediatric burn patients experience physical and psychosocial distress during the initial trauma and during the ongoing treatment of the burns [1]. Much of this ongoing distress is due to procedure pain, as it is noted as the most severe and common type of pain for burn patients [2]. Unfortunately, procedure pain is also most likely to be viewed as undertreated, with pharmacological methods often failing to meet children's needs for pain management [3,4]. However, when nonpharmacological methods are used in conjunction with pharmacological ones, pain during burn procedures is significantly reduced [5,6].

One type of nonpharmacological support offered to pediatric burn patients is distraction. Distraction is a type of procedure support in which the attention of children undergoing medical procedures is focused away from the procedure, pain, or thoughts of pain/distress to a more neutral stimulus [7]. Distraction activities such as bubbles, I-Spy, music, and video goggles have been found to decrease distress and pain in children undergoing medical procedures [1,8,9].

Virtual reality, multi-modal distraction (MMD), and interactive gaming consoles are a few distraction tools that utilize technology to improve pediatric experiences for children undergoing burn treatments [10–12]. Such an activity draws the children's attention into the cognitive and sensory stimulation of the animation or game and limits the cognitive resources available to think about or process pain of the procedure (i.e., distraction) [6,13]. In fact, fMRI scans show decreased activity in pain related brain activity during virtual reality [13]. For children undergoing treatments for burns, technology based distractions have been found to be an effective nonpharmacological adjunctive pain treatment during physical therapy [1,6], wound care [14], and rehabilitation exercise therapy [12].

One popular technology based distraction tool is a computer tablet (i.e. tablet). With the touch of a screen, pediatric patients have access to movies, music, interactive games, breathing tools, books, puzzles, and more. Using their assessment of a child's development and needs, as well as the upcoming procedure, medical team members, such as child life specialists, provide possible distraction items on the tablet to help their patient's cope during procedures. In other words, a tablet caters to a wide variety of developmental and stress potential needs of patients through one tool. This is important because distraction activities work best when the activity is age appropriate and intriguing to the child [15].

There is growing use of tablets in pediatric facilities because of the accessibility and flexibility of these devices. However, there is little research examining the effectiveness of tablets in improving pediatric patient care. A review of the literature finds a handful of studies that have examined the effectiveness of tablets for pediatric patients. Positive benefits of tablets during pediatric procedures have been found, including a decrease in perioperative anxiety [16], immunization pain [17], and anxiety during emergency room visits [18]. These findings suggest that tablets are effective in minimizing pain and distress in children undergoing procedures.

To date, studies examining the effectiveness of tablets in minimizing pain and distress in pediatric burn patients undergoing treatment procedures seem rare. The aim of this study was to examine the effectiveness of a computer tablet distraction provided by child life specialists for decreasing pain and anxiety in pediatric burn patients undergoing hydrotherapy. We hypothesized that children who experienced distraction by a child life specialist using a tablet would display less self-reported and observed pain as well as fewer behaviors indicative of anxiety while undergoing hydrotherapy compared to children who did not receive tablet distraction during hydrotherapy.

2. Methods

This study utilized a randomized control trial design. Ethics approval for this study was obtained from the Institutional Review Board at the University of Alabama at Birmingham and the University of Alabama.

2.1. *Participants*

Participants were recruited from the Children's of Alabama Burn Center in Birmingham, Alabama by one of the primary researchers who is a child life specialist. All subjects were pediatric inpatients admitted for the treatment of a new burn medically utilising hydrotherapy as standard treatment. Eligible participants were between the ages of 4 and 12 and were undergoing a hydrotherapy procedure with standard intravenous analgesia for pain management. For consistency purposes, only those children scheduled for their second or third hydrotherapy procedure were eligible. The second or third hydrotherapy session was chosen due to control for consistency of child life specialist presence during the hydrotherapy procedure, level of desensitization of burn wounds, and any pharmacological interventions that may have occurred in pre-hospitalization. Exclusion criteria included patients with cognitive or developmental delays, non-English speaking, and visual or physical impairments (i.e., burns located on the hands and forearms, burns around the eyes, broken arms, blindness) that would preclude the use of a tablet. Exclusion criterion also included children who were undergoing hydrotherapy with pre-medication administered orally. Demographic information (age, gender, and ethnicity), injury information (percentage of total body surface area affected-TBSA), and treatment (hydrotherapy bath number) were collected for statistical analyses purposes. Sample size calculations determined 15 participants were needed in each group for between group analysis (with a power of 0.65, alpha of 0.05, and 0.66 point reduction in pain using the 5 point FACES scale).

2.2. *Procedure*

Informed consent from a legal guardian and assent from age appropriate patients (ages 7–12) was obtained by the child life specialist. Waiver of assent was obtained by legal guardians for children between 4 and 6 years old. Once enrolled in the study with consent and assent, participants were randomly assigned using random sample numbers generated by computer software to one of two groups. One half of the participants

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