Emotion Regulation and Positive Affect in the Context of Salivary Alpha-Amylase Response to Pain in Children with Cancer: Physiology, Self-Report, and Behavior

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Introduction

- Children with cancer are repeatedly exposed to aversive stimuli including painful medical procedures (Richardson et al., 2006).
- Emotional regulation techniques may prove useful during such experiences and contribute to pain resilience (Cohen et al., 2006).
- Distraction and reappraisal are commonly used emotion regulation techniques in interventions for pain management (Woltzky et al., 2005; Bisignano et al., 2006).
- Reassurance is less commonly used in intervention work (Chorney et al., 2013).
- However parents regularly use reassurance with their children and this may be detrimental as it draws the child’s attention towards their pain (Chorney et al., 2013).

Primary Question

How do emotion regulation strategies (distraction, reappraisal, and reassurance) impact physiological, self-reported and behavioral pain responses in pediatric patients with cancer?

Study Design

Key Findings

- Children in the reassurance condition exhibited sAA levels that continued to rise post completion of the CPT as compared to children in the distraction condition ($\beta = -1.68$, $p = .021$).
- Children in the reassurance condition as compared to children in the reappraisal condition had a marginally significantly greater increase in sAA levels that continued to rise post completion of the CPT ($\beta = -1.24$, $p = .084$).
- No significant differences in self-reported pain severity ($\text{Wald } \chi^2(2) = 2.47, p = .292$) or behavioral pain tolerance ($\text{Wald } \chi^2(2) = 21.38, p = .002$) among the emotion regulation conditions.

Method

- 73 children (ages 6-18 years) undergoing treatment for cancer at Children’s Hospital of Orange County (CHOC) participated in this study.
- Children were randomly assigned to one of three emotion regulation conditions: distraction (watched animal documentary), reappraisal (thought about how their participation will help other kids like them), or reassurance (“I’m really sorry you have to do this, I know how it feels”).
- Cold Pressor Task (CPT)
  - Children placed their hand in a bucket of 7°C water.
  - Child removed their hand when they could no longer tolerate the pain.
- Main Outcomes
  - Physiological: Saliva samples were collected 15 minutes before CPT (pre-task), immediately after CPT (post-task 1), and 15 minutes after CPT (post-task 2). Saliva samples were assayed for alpha-amylase.
  - Self-reported pain: Children rated their pain using Numeric Rating Scale immediately upon hand removal.
  - Behavioral pain tolerance: Time of hand removal = pain tolerance

Discussions

- Certain emotion regulation strategies such as distraction and reappraisal may weaken the stress response to painful medical procedures in pediatric patients with cancer.
- Reassurance directs the child’s attention towards the pain without providing a way to reinterpret it.
- In the context of acute pain, reassurance may actually increase distress.
- Distraction and reappraisal may give the child a sense of self-control over the situation.
- Subjective and behavioral indicators of pain may not always match the physiological response to pain.
- It is necessary to assess all three outcomes

References