Effects of distraction on children's pain and distress during medical procedures: a meta-analysis

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Authors' objectives
To determine the effectiveness of distraction on young children's distress behaviour and self-reported pain during medical procedures.

Searching
The following databases were searched electronically for English language studies: Cancerlit (1992 to August 1996), HealthSTAR (1994 to September 1996), MEDLINE (1966 to October 1996) and CINAHL (1982 to August 1996); the keywords were given. The CINAHL database was handsearched from 1970 to 1982 using the keywords 'pain' and 'children'. Additional sources included the Psychology Database at the University of Iowa libraries, Periodical Abstracts Database (1986 to 1996), ERIC and Wilson Database. Unpublished studies were sought in the Dissertation Abstracts database from 1961 to 1996 using a broad search strategy with keywords 'child' and 'pain' or 'distraction' or 'distress'. Reference lists in research and review articles were scanned.

Study selection
Study designs of evaluations included in the review
Randomised clinical trials (RCT) and repeated measure trials that assessed self-reported pain or observed distress in children undergoing medical procedures, were included if means and standard deviations were available for outcomes in both treatment arms.

Specific interventions included in the review
Distraction methods, defined as any intervention intended to focus the subject's attention away from the pain or discomfort, included simple methods and packages of distraction techniques. Simple techniques included the following: music or story via headphones; party blower; non-procedural talk by parent or professional; cartoon; toy; kaleidoscope; story and poster. Packages included imagery alone; imagery and reinforcement; imagery, breathing and rehearsal; distraction, relaxing images, reinforcement; distraction and breathing; and imagery, breathing, non-procedural talk and concentrating.

Participants included in the review
Children aged 3 to 15 years (mean 6.6 years) undergoing the following procedures were studied: intravenous before surgery; injection; bone marrow aspiration; lumbar puncture; venipuncture; burn treatment; and dentistry procedure.

Outcomes assessed in the review
Pain and distress were assessed. Pain scales included the following: FACES; OUCHER; Child's Global Rating Scale; and Visual Analogue Scale. Distress scales included the following: Global Distress Scale; Observation Scale of Behavioural Distress; Procedural Behaviour Rating Scale; Children's Hospital of Eastern Ontario Pain Scale; Burn Treatment Distress Scale; Child Behaviour Observation Code; Behaviour Rating Profile Scale; Anxiety and Disruptive Behaviour Code; and Total Disruptive Behaviour.

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the authors performed the selection.

Assessment of study quality
The authors do not state that they assessed validity.
Data extraction
An effect size statistic was calculated for each study using Cohen's formula for RCTs (see Other Publications of Related Interest). For repeated measure studies the denominator was the control standard deviation.

Methods of synthesis
How were the studies combined?
A mean effect size, observed variance of the effect size and the sampling error were estimated using Hunter and Schmidt's method in which weighting is by sample size (see Other Publications of Related Interest). Previous studies of parallel forms of self-report of pain in children aged 3 to 7 years were used to estimate measurement error.

How were differences between studies investigated?
Sub-analysis was conducted for subjects between 3 and 7 years who were all having injections as part of well-child care.

Results of the review
Nineteen studies were included (694 children).

Pain was assessed using 10 studies (535 children).

Distress was assessed using 15 studies (491 children).

None of the studies reported reliability for self-reported pain. Pain: distraction reduced pain reported. Average effect size = 0.62 (standard deviation 0.42). Sampling error accounted for 30.58% of variance and measurement error for 4.3%. Sub-analysis of children aged 3 to 7 years having injection (3 RCTs, 268 children): average effect size 0.47 (standard deviation 0.26). Sampling error accounted for 60% of variance indicating that moderator variables other than age and procedure type, influenced the effectiveness of distraction.

Distress: distraction reduced distress reported. Effect size = 0.33 (standard deviation 0.17). Sampling error accounted for 73.44% and measurement error for 0.4% of the observed variance.

Authors' conclusions
Distraction has a positive effect on children's distress behaviour across the populations represented in this study. Controlling for age and type of painful procedure significantly increased the amount of explained variance but there are other unidentified moderators at work.

CRD commentary
The aims and inclusion criteria were stated. An extensive literature search was conducted. Some relevant details on the primary studies was clearly presented in tabular format. Results were clearly reported. Sub-group analysis was undertaken to investigate the influence of potential moderator variables.

Methods used to select primary studies and extract data were not described. Validity was not assessed.

The strength of the evidence presented would have been increased by validity assessment.

Implications of the review for practice and research
Practice: The authors consider that using distraction with children during medical procedures will reduce the amount of observed distress behaviour for most children.

Research: The authors consider that exploration is required into the influence of temperament and prior experience on children's responses during medical procedures and to search for additional moderator variables.
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Other publications of related interest

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.