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Music Therapy May Reduce Pain and Anxiety in Children Undergoing Medical and Dental Procedures

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Summary

Subjects

A search of sixteen databases yielded 4559 citations. From these, 393 potentially eligible studies were identified; 19 randomized clinical trials (RCT) met eligibility criteria and were selected for review. The RCTs were conducted in various clinical settings; 4 were conducted in dental clinics. The trials included 1513 patients, primarily children and a few young adults who underwent medical and dental procedures associated with pain and anxiety. Age ranged from 8 months to 20 years; studies were included if the majority of patients were no more than 18 years of age.

Exposure

The intervention was active or passive music therapy (MT). The former involved a music therapist and interactive communication; the latter involved listening to music. Type of music varied (e.g., folk, contemporary, classical, lullaby). In some studies, children selected the type of music. In 4 studies, music was combined with other modalities, such as relaxation exercises. In 12 studies, MT was compared to standard care; in 6 studies, to an active intervention (e.g., spoken story), placebo (headphones without music), or conversations with a music therapist; in 2 studies, to a pharmacological agent.

Article Title and Bibliographic Information

Music for Pain and Anxiety in Children Undergoing Medical Procedures: A Systematic Review of Randomized Controlled Trials. Klassen JA, Liang Y, Tjosvold L, Klassen TP, Hartling L. *Ambulatory Pediatrics* 2008;8(2):117-128.

Level of Evidence

2

Strength of Recommendation Grade

B

Purpose

To evaluate the effectiveness of music therapy for reducing pain and anxiety in children undergoing clinical procedures.

Type of Study/Design

Systematic Review

Source of Funding

No external sources of support reported

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Main Outcome Measure

The primary outcomes, pain and anxiety, were assessed with a variety of self-reported and observational measures. Some measures were reported as being reliable and valid.

Main Results

Three meta-analyses were reported comparing MT to a control group. Based on a synthesis of 9 RCTs (704 children), MT significantly reduces pain or anxiety (standardized mean difference [SMD] = -0.35 ; 95% confidence interval [CI] -0.55 to -0.14). A test of the difference in the pooled effect estimates for active vs. passive therapy was not statistically significant. Based on a synthesis of 5 RCTs (284 children), MT reduces anxiety (SMD = -0.39 ; 95% CI -0.76 to -0.03). Based on a synthesis of 5 RCTs (465 children), MT reduces pain (SMD = -0.39 ; 95% CI -0.66 to -0.11).

Because heterogeneity (between study differences) was moderate to substantial, a qualitative synthesis of 19 studies was conducted. This narrative comparison of the included studies appears to support the meta-analyses. Further quantitative analyses of subgroup differences were conducted to investigate sources of heterogeneity.

Conclusion

The authors concluded that music reduces pain and anxiety for children undergoing medical or dental procedures. Based on subgroup analyses, they further concluded that passive MT may be as effective as active MT, that MT when combined with other modalities may be more effective than when presented alone, and that MT can reduce the amount of pharmacological agents needed to control pain and anxiety.

Commentary and Analysis

Dentists strive to reduce or eliminate anxiety and pain experienced by children under their care for humane reasons, but also to improve patient manageability and satisfaction. In this systematic review, Klassen et al. considered whether music could help control pediatric pain and anxiety. Their thorough search was commendable, as it included strategies for finding both published and unpublished research in numerous sources. Subsequent analyses found no evidence of publication bias. However, the overall quality of the primary studies (as measured by the Jadad scale) was very low even though they were randomized and controlled. They also varied considerably with respect to type of music therapy, setting, procedure, age of patient, and so on. Moreover, individual responses to music therapy varied considerably within studies (as indicated by the magnitude of the standard deviation relative to the mean, when reported). Low quality and heterogeneity together mean that the results of the quantitative meta-analyses must be viewed as suggestive rather than confirmatory.

Another potential limitation is indicated by the equivalence of the pooled standardized mean differences for music therapy vs. a control group when computed separately for anxiety and pain. This suggests that measures of the primary outcomes may assess the same or closely related constructs. Nevertheless, the narrative synthesis and the quantitative meta-analysis pooling study outcomes for pain or anxiety together suggest that music therapy can be effective in the dental operatory.

Passive music therapy would be easy to implement. For example, music could be played for very young children, or listened to on portable audio players with headsets by older children. If a patient forgets to bring her own player, the dentist could offer one for use in the waiting room and operatory, being sure to demonstrate how to use the controls. The perceived clinical value of music therapy probably will depend on the responses of children in a particular

practice, but it seems worth exploring as a potentially effective and inexpensive adjunct to standard care.