

Relaxation Training and Postoperative Music Therapy for Adolescents Undergoing Spinal Fusion Surgery

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■ ABSTRACT:

Spinal fusion for idiopathic scoliosis is one of the most painful surgeries experienced by adolescents. Music therapy, utilizing music-assisted relaxation with controlled breathing and imagery, is a promising intervention for reducing pain and anxiety for these patients. It can be challenging to teach new coping strategies to postoperative patients who are already in pain. This study evaluated the effects of introducing music-assisted relaxation training to adolescents before surgery. Outcome measures were self-reported pain and anxiety, recorded on 0-10 numeric rating scale, and observed behavioral indicators of pain and relaxation. The training intervention was a 12-minute video about music-assisted relaxation with opportunities to practice before surgery. Forty-four participants between the ages of 10 and 19 were enrolled. Participants were randomly assigned to the experimental group that watched the video at the preoperative visit or to the control group that did not watch the video. All subjects received a music therapy session with a board certified music therapist on postoperative day 2 while out of bed for the first time. Pain and anxiety were significantly reduced from immediately pre-therapy to post-therapy (paired t-test; p).

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BACKGROUND

Spinal fusion (SF) for adolescent idiopathic scoliosis (AIS) is one of the most painful surgeries experienced by adolescents. Despite pharmacologic intervention, pain scores are frequently above five (on a zero to 10 scale) in the first few postoperative days (Kleiber, Suwanraj, Dolan, Berg, & Kleese, 2007; Kotzer, 2000; LaMontagne, Hepworth, Salisbury, & Cohen, 2003; Rullander, Jonsson, Lundstrom, & Lindh, 2013). Teaching pain coping strategies (Logan & Rose, 2005) and anxiety reducing strategies (Caumo et al., 2000; Gillies, Smith, &

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Parry-Jones, 1999) can positively impact postoperative pain. Cognitive-behavioral techniques such as relaxation and deep breathing are recommended to relieve pain and anxiety in adolescents (Sieberg et al., 2013; Srouji, Ratnapalan, & Schneeweiss, 2010).

Although much is known about preparing children for hospitalization, little is written about the best methods for preparing adolescents for elective surgery. In a rare study of teenagers and surgery, LaMontagne and colleagues (2003) reported that providing coping training, such as instruction on deep breathing, relaxation and positive self-talk, to adolescent spinal fusion patients was associated with lower pain levels on the second postoperative day. The training interventions were provided about 2 days before surgery. Replication of this study has not been reported in the literature. Broad guidelines for preparing children and teens for cardiac procedures have been published (LeRoy, et al., 2003) recommending that adolescents from 12 to 15 years benefit from peer counseling and coping skills training.

Music Interventions for Surgical Pain

Music interventions have been shown to decrease postoperative pain intensity and anxiety in adults (Allred, Byers, & Sole, 2010; Easter et al., 2010; Good, Anderson, Stanton-Hicks, Grass, & Makil, 2002; Good et al., 2010; Kemper & Danhauer, 2005; Pelletier, 2004; ehuda, 2011) and children (Bradt, 2010; Chetta, 1981; Klassen, Liang, Tjosvold, Klassen, & Hartling, 2008; Nilsson, Kokinsky, Nilsson, Sidenvall, & Enskar, 2009; Suresh, De Oliveria, & Suresh, 2015). Passive music listening interventions, which involve listening to preselected genres of recorded music on headphones, typically are utilized by nurses to provide additional comfort for patients. Studies using this intervention often lack justification for the selection of music, making it difficult to generalize results, replicate studies, and apply results to clinical practice (Tan, Yowler, Super, & Fratianne, 2012). A music therapy session differs from a passive music listening intervention. Music therapists assess individual patient needs and carefully select and apply music based on factors including the music's psycho-physical properties (speed, volume, complexity) and the patient's musical preference (Tan et al., 2012). The music therapist often performs live music for the patient to adapt the music to the patient's specific needs.

The mechanism by which music ameliorates the pain response includes an emotional component. Positive emotional responses to preferred music increase cerebral blood flow to pleasure and reward centers in the brain and decrease amygdala activity, which

also is involved in the affective component of pain perception (Blood & Zatorre, 2001). The emotional valence (pleasant vs. unpleasant) experienced by the patient while listening to music is central to the effectiveness of music for relieving pain. Music that induces positive emotions is significantly correlated to decreased pain intensity, whereas music that induces a negative emotional response has no significant pain-modulating effect (Roy, Peretz, & Rainville, 2007; Hsieh et al., 2014). Therefore, the careful selection of music individualized to each patient is necessary in order to provide therapeutic benefit.

Music therapy may be especially useful in helping school-aged children and young adolescents deal with postoperative pain and distress. Robb's contextual support model (Robb, 2003) proposed that contextual support affects a child's ability to cope with hospitalization by buffering the negative effects of stress and increasing the child's engagement with the environment. According to this model, music therapy is utilized to re-engage patients with the environment through: (1) Structure: music interventions provide children with opportunities for success and mastery within the environment, (2) Autonomy Support: music interventions provide children opportunities to make choices and direct the course of activities, and (3) Involvement: within the session the therapist expresses unconditional acceptance of children and reinforces their efforts. In this way, music therapy promotes adaptive coping skills by allowing choice and control within a structured session in relationship with the therapist.

Preliminary Work

Over the past few years the authors' hospital used music-assisted relaxation within music therapy sessions to help AIS patients manage pain. However, the authors observed that when the adolescents were engaged in physical activity like moving from bed to chair on postoperative day 2, they were sometimes in too much pain to learn new techniques to help them cope. In an effort to help these patients develop coping skills to use after surgery, the authors investigated ways to teach coping skills prior to surgery. When the authors asked previous SF patients about their recollection of music therapy, a common theme was the need for preoperative information about how to cope with pain (Kleiber & Adamek, 2013).

Preoperative anxiety is correlated with higher postoperative pain intensity (Chieng et al., 2013; Logan & Rose, 2005); therefore, preoperative training was developed to mitigate this effect. In a 9-month feasibility study, the authors developed and pilot tested a preoperative training program with 10 SF patients.

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