

The Benefits of Preoperative Art Activities for Pediatric Patients in Managing Anxiety and Increasing Procedural Understanding

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ABSTRACT

Pediatric patients commonly experience anxiety before surgical procedures, which can negatively affect both their emotional well-being and the healing process. Art therapy has been widely used in healthcare settings as a non-pharmaceutical method for reducing anxiety and promoting emotional stability in children. This study investigates whether preoperative art activities can reduce anxiety and improve procedural understanding in pediatric surgical patients compared to standard care. The findings may support the use of informative art as an effective intervention for improving the preoperative experience of children undergoing surgery.

INTRODUCTION

Stress is known to significantly impair the healing process in patients. The effects of stress on healing have important implications, especially in the context of surgery and naturally occurring wounds.

1.1 STRESS AND ITS EFFECT ON SURGICAL PROCEDURE

Stress and anxiety can hinder healing by suppressing immune responses, impairing cytokine signaling, and reducing collagen production, all of which are essential for tissue repair and wound closure. A common practice for reducing stress is art therapy. Art therapy is widely used to manage stress and anxiety in patients, particularly children, because it engages them and provides a means for emotional stability. MRI research conducted at the University of Stanford revealed that creative and artistic activities engage multiple regions of the brain, including both cerebral hemispheres, and may support stress reduction and cognitive functioning (1). Informative art, which combines information with visual art, can greatly reduce preoperative anxiety in pediatric patients, as diagrams provide children with a visual representation that may deepen their understanding of the procedure before it happens. The ability to heal after surgery, especially in children, is crucial for improving their quality of life, and art offers a natural way to reduce factors that may interfere with the healing process.

1.2 ART THERAPY IN PREOPERATIVE SETTINGS

Art therapy is not a new approach to managing stress and has been used in clinical settings for many years. A study conducted by Bhasara Kalpana Ramji and published on the National Library of Medicine showed that art therapy was shown to reduce severe pain levels from 97.6% to 12.2% and severe anxiety from 90.2% to 26.8% (1). Art therapy thus has the potential to reduce the amount and severity of preoperative anxiety in a way that does not require the use of pharmaceutical intervention.

1.3 CURRENT GAP IN THE RESEARCH

Although previous studies have demonstrated that art therapy can effectively reduce stress, anxiety, and pain in pediatric patients, relatively little research has examined the use of informative art activities specifically in preoperative settings. Most existing studies focus on art as a form of emotional expression or distraction during hospitalization rather than as a tool for patient education and procedural preparation. As a result, this study investigates whether art that is designed to explain surgical procedures can simultaneously reduce anxiety and improve a child's understanding of what they can expect before and during surgery.

METHODS

A literature search was conducted using Google Scholar to identify peer-reviewed evidence supporting the use of informative art-based interventions for reducing stress and anxiety in pediatric patients. Five relevant studies were selected based on their alignment with the study hypothesis. Search terms included "anxiety," "art therapy," "pediatric," "stress," and "informative". The search was limited to studies published from 2015 onward. These requirements facilitated the retrieval of studies examining the therapeutic effects of art-based activities within pediatric populations. Search terms such as "dental", "orthodontics," and "service animals" were excluded in order to produce responses that were directly relevant to surgical procedures in a hospital setting rather than dental care or animal-based therapy techniques. The evidence obtained from these studies was subsequently summarized in Table 1.

RESULTS

The literature review identified five studies that collectively demonstrated the beneficial effects of art-based and educational interventions on reducing stress and anxiety in pediatric patients. Across various study designs, including randomized controlled trials, systematic reviews, and experimental studies, these interventions were associated with improved emotional regulation, reduced procedural pain, anxiety, and enhanced psychological well-being. Educational resources, such as child-focused pop-up books, were shown to alleviate preoperative fear, while art-healing and play therapy significantly reduced pain and anxiety during clinical procedures. Furthermore, evidence suggests that reducing preoperative

anxiety may improve postoperative recovery outcomes. Experimental findings also highlighted that creative activities engaged specific and organized patterns of neural activity, supporting the potential therapeutic role of art in pediatric healthcare settings.

Study Name, Year	Participants/ Study Design	Type of Intervention	Measured Output	Conclusion	References
Cordray H. et al., 2022	Prospective randomised controlled trial.	Informative material	Fear of anesthesia induction	The educational pop-up book offers a child-focused resource that helps alleviate children's preoperative fears.	2
Barnett KS et al., 2024	Systematic review	Art therapy	Changes in indicators of stress, emotional regulation, mood, and psychological well-being associated with participation in creative arts activities.	Participation in creative art activities was associated with improved emotional regulation, mood and psychological well-being compared with no art intervention.	3
Shebl MA, et al., 2025	Systematic review and meta-analysis	N/A	Surgical outcomes associated with preoperative anxiety.	Higher levels of preoperative anxiety are associated with worse surgical outcomes, including increased postoperative pain, greater use of pain medication, longer recovery times, and poorer overall recovery.	4
Fathia Ahmed Mersal, et al., 2025	Experimental, three-arm study	Art and Play therapy	Pain and anxiety levels before and after venipuncture	Children who participated in art healing or play therapy experienced	5

				significantly lower levels of pain and anxiety during venipuncture than children who received standard care.	
Goldman B, 2015	Experimental study	N/A	Patterns of brain activity measured using functional MRI (fMRI) during creative vs. non-creative drawing tasks	Creativity is not a random process but rather involves specific and organized patterns of brain activity.	6

TABLE 1.

Summary of studies evaluating the effects of art-based interventions on stress and anxiety outcomes in pediatric patients.

DISCUSSION

Based on the reviewed research, preoperative art activities have the potential to reduce anxiety and improve procedural understanding in pediatric surgical patients. By combining art therapy with procedural education, children may feel more prepared for surgery and less fearful when art-based interventions are used to provide both emotional support and procedural information. Because stress and anxiety can negatively affect both emotional well-being and recovery, helping children feel calmer before the procedure could not only improve their hospital experience but also provide a non-invasive and relatively low-cost alternative to anxiety and stress management. Although other therapeutic approaches may also promote emotional regulation, the reviewed studies suggest potential benefits from creative activities. The mentioned studies suggest that children may experience improved emotional regulation and relaxation when they engage in these activities due to not only the mental stimulation, but the tangible product they create. Combining art with procedural information may provide additional benefits. The reviewed sources suggest that educational materials can improve children's understanding and mental preparation for medical procedures. One potential application would be to provide coloring sheets containing diagrams of the surgical procedure. These papers could be provided to the patients while waiting in the preoperative areas to help reduce the stress and improve the chances of cooperation.

However, there are also limitations to these benefits. One major limitation is that every child responds differently to stress and anxiety. Factors such as age, personality, previous medical experiences, and family involvement can influence how effective an art-based intervention may be. Additionally, the

hospital environment, child cooperation, and complexity of the surgery can also drastically affect the potential benefit of the proposed solution. Another limitation is the process of actually measuring anxiety levels. Anxiety is a subjective experience that cannot be directly measured in a physical quantity, which raises the issue of actually measuring how much anxiety can be relieved from art-based intervention. This can also apply to the limitations of current methods for measuring anxiety, because of the different methods, comparing anxiety levels between sources can be difficult. Finally, this paper only consists of a small number of sources with all the information consisting of different intervention types, study designs, and outcome measures. These differences make it difficult to draw firm conclusions about the effectiveness of informative preoperative art activities specifically.

CONCLUSION

Informative art-based activities provided to pediatric patients before surgery may help reduce preoperative anxiety and improve procedural understanding. These interventions may also support a more positive healthcare experience while providing a non-pharmacological approach to anxiety management.

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