

COMPARISON OF VIDEO DISTRACTION AND PARENTAL RECORDED VOICE ON PREOPERATIVE ANXIETY IN PEDIATRIC PATIENTS UNDERGOING ELECTIVE SURGERY AT MAYO HOSPITAL

Maria Shoaib^{*1}, Maidah Mehtab², Fiza Shafique³

^{1,2,3}Department of Anaesthesiology, King Edward Medical University/Mayo Hospital, Lahore, Pakistan

¹mariashoaib612@gmail.com, ²maidahmehtab@kemu.edu.pk, ³fizashafique10@gmail.com

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Corresponding Author: *

Maria Shoaib

Abstract:

Background and Objective: Preoperative anxiety is common among children undergoing surgery and may be triggered by separation from parents, fear of pain, and exposure to an unfamiliar operating theatre environment. This study compared observed preoperative anxiety following video distraction versus parental recorded voice among pediatric patients undergoing elective surgery.

Materials and Methods: A randomized controlled trial was conducted among 100 pediatric patients aged 4–10 years who were scheduled for elective surgery. Participants were randomly allocated in a 1:1 ratio to either the video distraction group (n = 50) or the parental recorded voice group (n = 50). Each intervention was administered for 10 minutes in the preoperative area. Anxiety was assessed using the Modified Yale Preoperative Anxiety Scale–Short Form (mYPAS-SF). The four assessed domains were Activity, Vocalization, Emotional Expressivity, and State of Apparent Arousal; the Use of Parents domain was not assessed. The primary outcome was the mYPAS-SF score. Between-group differences in continuous variables were assessed using an independent-samples t-test, while anxiety categories were compared using Pearson's chi-square test. A two-sided p-value < 0.05 was considered statistically significant.

Results: Children in the video distraction group had a lower mean mYPAS-SF score than those in the parental recorded voice group (1.68 ± 0.46 vs. 2.23 ± 0.52 ; mean difference, -0.55 ; $t(98) = -5.58$; $p < 0.001$). The between-group difference corresponded to a large effect size (Cohen's $d = 1.12$). Low anxiety was observed in 36 (72.0%) children in the video distraction group and 16 (32.0%) children in the parental recorded voice group. Moderate anxiety was observed in 13 (26.0%) and 30 (60.0%) children, respectively, whereas high anxiety was observed in 1 (2.0%) and 4 (8.0%) children, respectively. The distribution of anxiety categories differed significantly between the groups ($\chi^2(2) = 16.213$, $p < 0.001$; Cramer's $V = 0.403$).

Conclusion: Video distraction was associated with lower observed preoperative anxiety than parental recorded voice among children undergoing elective surgery. Its simple, nonpharmacological, and potentially practical nature supports its consideration as an adjunctive approach to pediatric preoperative anxiety management.

Introduction:

Preoperative anxiety is a common and clinically significant concern among pediatric surgical patients. It may arise from separation from parents, fear of pain, and exposure to an unfamiliar operating theatre environment.¹ Elevated anxiety levels have been associated with poor cooperation during anesthesia induction, increased anesthetic requirements, and adverse postoperative behavioral outcomes.² Children may be particularly vulnerable because of their limited ability to understand medical procedures and regulate emotional responses. At this developmental stage, distraction-based interventions may help redirect attention away from stressful stimuli.

Management strategies for pediatric preoperative anxiety include pharmacological and nonpharmacological approaches. Although midazolam is an effective anxiolytic, its use may be limited by potential adverse effects, including respiratory depression, paradoxical agitation, delayed recovery, and postoperative behavioral changes.³

Nonpharmacological interventions have received increasing attention because of their safety, feasibility, and child-friendly nature. Common approaches include play therapy, music therapy, parental presence, parental recorded voice, and audiovisual distraction.⁴ Parental involvement during anesthesia induction may provide emotional reassurance and a sense of security. In a randomized study, Yucedag et al. found that children who participated in selecting the accompanying parent experienced less anxiety during anesthesia induction, whereas no significant difference in anxiety was observed between groups while waiting in the preoperative area.⁵ Parental recorded voice is another nonpharmacological approach that provides familiar auditory reassurance without requiring the physical presence of a parent. Avighan et al. reported significantly lower anxiety scores among children exposed to their mother's recorded voice compared with the control group.⁶

Audiovisual distraction has also been investigated as an approach to reducing anxiety during the perioperative period. Wang et al. reported that children receiving preoperative

video distraction had lower anxiety scores at separation from their parents and at the beginning of inhalational induction compared with those receiving routine clinical care.⁷ Kim et al. found that video distraction was associated with improved cooperation during mask induction in children undergoing elective surgery.⁸ Bandyopadhyay et al. also reported lower preoperative anxiety scores and better cooperation during anesthesia induction among children receiving video distraction compared with standard care.⁹ These findings suggest that audiovisual distraction may help redirect children's attention away from stressful perioperative experiences and facilitate cooperation during anesthesia induction.

Assessment of preoperative anxiety requires a standardized behavioral assessment tool. The Modified Yale Preoperative Anxiety Scale–Short Form (mYPAS-SF) is a short-form instrument developed for assessment of preoperative anxiety in children.¹⁰ The original mYPAS evaluates five behavioral domains, whereas the short form uses four domains after removal of the Use of Parents domain. The four domains assessed in the present study were Activity, Vocalization, Emotional Expressivity, and State of Apparent Arousal.

Although both video distraction and parental recorded voice have been investigated as nonpharmacological approaches to pediatric anxiety management, evidence directly comparing their relative effectiveness remains limited. Accordingly, the present study was undertaken to compare observed preoperative anxiety following video distraction and parental recorded voice among children scheduled for elective surgery. Both interventions can be delivered without administration of a sedative or anxiolytic drug and may therefore provide practical options for pediatric perioperative care. Determining which approach is associated with lower observed anxiety may help clinicians select an appropriate nonpharmacological strategy, particularly in resource-limited healthcare settings.

Materials and Methods:

Study Design: This study was a randomized controlled trial.

Setting:The study was conducted in the Pediatric Operating Theatres at Mayo Hospital, Lahore, Pakistan.

Sample Size:The total sample consisted of 100 pediatric patients, with 50 participants in each group. The sample-size calculation was based on a 95% confidence level, 10% absolute precision, and an expected response rate of 54.5%.

Ref.

$$n = \frac{Z_{1-\alpha/2}^2 \times p \times q}{d^2}$$

Where:

- $Z_{1-\alpha/2}$ = confidence level 95% = 1.96
- p = prevalence 54.5%
- $q = 1 - p$
- d = absolute precision 10%

Randomization:Eligible pediatric patients who met the inclusion criteria were enrolled and randomly allocated to either the Video Distraction Group (Group A) or the Parental Recorded Voice Group (Group B) using a lottery method for simple random allocation.

Sample Selection

Inclusion Criteria

- Pediatric patients aged 4–10 years
- Patients of either sex
- American Society of Anesthesiologists (ASA)

Physical Status I

- Patients scheduled for elective surgery under general anesthesia

Exclusion Criteria

- Patients with a history of developmental delay
- Patients with cognitive, hearing, or visual impairment
- Patients undergoing emergency surgery
- Patients with ASA Physical Status II, III, or IV

Study Population:The study included pediatric patients aged 4–10 years who were scheduled for elective surgical procedures in the Departments of Pediatric Surgery, Ophthalmology, Ear, Nose and Throat (ENT) Surgery, and Plastic Surgery.

Data Collection Procedure:After obtaining ethical approval from the relevant Ethical Review Committee of King Edward Medical University/Mayo Hospital, Lahore (Approval No. 552/RC/KEMU), 100 pediatric patients who met the inclusion criteria were enrolled. Written informed consent was obtained from

the parents or legal guardians before participation.

Demographic and clinical information, including age, sex, medical record (MR) number, and type of surgery, was recorded for each participant.

Eligible participants were randomly allocated to one of two study groups using a simple randomization method based on a lottery procedure: Group A (Video Distraction) and Group B (Parental Recorded Voice).

On the day of surgery, patients were transferred to the pre-induction area. In Group A, an age-appropriate cartoon or video selected according to the child's interest was played for 10 minutes in the preoperative area. In Group B, a recording of the parent's voice was played for the same duration.

Following the intervention, preoperative anxiety was assessed using the Modified Yale Preoperative Anxiety Scale–Short Form (mYPAS-SF). The four assessed domains were Activity, Vocalization, Emotional Expressivity, and State of Apparent Arousal. The Use of Parents domain was not assessed.

All completed data-collection forms were securely stored for subsequent statistical analysis. Participant confidentiality and anonymity were maintained throughout the study, and all research procedures were conducted in accordance with the approved ethical requirements.

Statistical Analysis:Data were entered and analyzed using IBM SPSS Statistics for Windows, Version 26.0 (IBM Corp., Armonk, NY, USA). Continuous variables, including age and mYPAS-SF scores, were expressed as mean $\pm$ standard deviation (SD). Categorical variables, including sex and surgical department, were presented as frequencies and percentages.

The normality of continuous variables was assessed before analysis. Comparisons between the video distraction and parental recorded voice groups were performed using the independent-samples t-test for continuous variables. Pearson's chi-square test was used to compare categorical variables, including anxiety categories. All statistical tests were two-tailed, and a p-value < 0.05 was considered statistically significant.

Results: A total of 100 pediatric patients were included in the study, with 50 participants allocated to each intervention group. The mean age of the participants was 7.05 ± 1.99 years. Overall, 60 (60.0%) participants were male and 40 (40.0%) were female. Regarding surgical department, 42 (42.0%) patients underwent eye surgery, 38 (38.0%) underwent pediatric surgery, and 10 (10.0%) each underwent plastic surgery and ENT surgery.

Comparison of mYPAS-SF Scores Between Intervention Groups

The mean mYPAS-SF score was 1.68 ± 0.46 in the video distraction group and 2.23 ± 0.52 in the parental recorded voice group. The mean difference between the groups was -0.55 (95% CI, -0.746 to -0.354).

An independent-samples t-test demonstrated a statistically significant difference in mean mYPAS-SF scores between the two groups ($t(98)$

$= -5.58$, $p < 0.001$). The effect size was large (Cohen's $d = 1.12$), indicating a substantial between-group difference in observed preoperative anxiety (Table 1).

Distribution of Anxiety Categories

In the video distraction group, 36 (72.0%) children were classified as having low anxiety, 13 (26.0%) as having moderate anxiety, and 1 (2.0%) as having high anxiety. In the parental recorded voice group, 16 (32.0%) children were classified as having low anxiety, 30 (60.0%) as having moderate anxiety, and 4 (8.0%) as having high anxiety.

The distribution of anxiety categories differed significantly between the two intervention groups (Pearson's $\chi^2(2) = 16.213$, $p < 0.001$). Cramer's V was 0.403, indicating a moderate association between intervention group and anxiety category (Table 2).

Table 1. Comparison of mYPAS-SF Scores Between Intervention Groups

Variable	Video Distraction (n=50)	Parental Recorded Voice (n=50)	Mean Difference	t	p-value	Cohen's d
mYPAS-SF score (Mean $\pm$ SD)	1.68 ± 0.46	2.23 ± 0.52	-0.55	-5.58	<0.001	1.12

Note: CI, confidence interval; SD, standard deviation; four-domain mYPAS-SF, Modified Yale Preoperative Anxiety Scale.

Table 2. Distribution of anxiety categories according to intervention group

Anxiety Category	Video Distraction n(%)	Parental Recorded Voice n(%)	Total n(%)
Low Anxiety	36(72%)	16(32%)	52(52.0%)
Moderate Anxiety	13(26%)	30(60%)	43(43%)
High Anxiety	1(2%)	4(8%)	5(5%)
Total	50(100%)	50(100%)	100(100%)

Note: Pearson's $\chi^2(2) = 16.213$, $p < 0.001$; Cramer's $V = 0.403$.

Table 3. Baseline Characteristics of study participants

Characteristics	Overall(N=100),n(%) / Mean $\pm$ SD

Age (Years)	Age	7.05± 1.99
Gender	Male	60(60.0%)
	Female	40(40.0%)
Surgical Department	Plastic Surgery	10(10.0%)
	ENT Surgery	10(10.0%)
	Pediatric Surgery	38(38.0%)
	Eye Surgery	42(42.0%)
Study Group	Video Distraction	50(50.0%)
	Parental Recorded Voice	50(50.0%)

Note: SD, standard deviation; ENT, ear, nose, and throat.

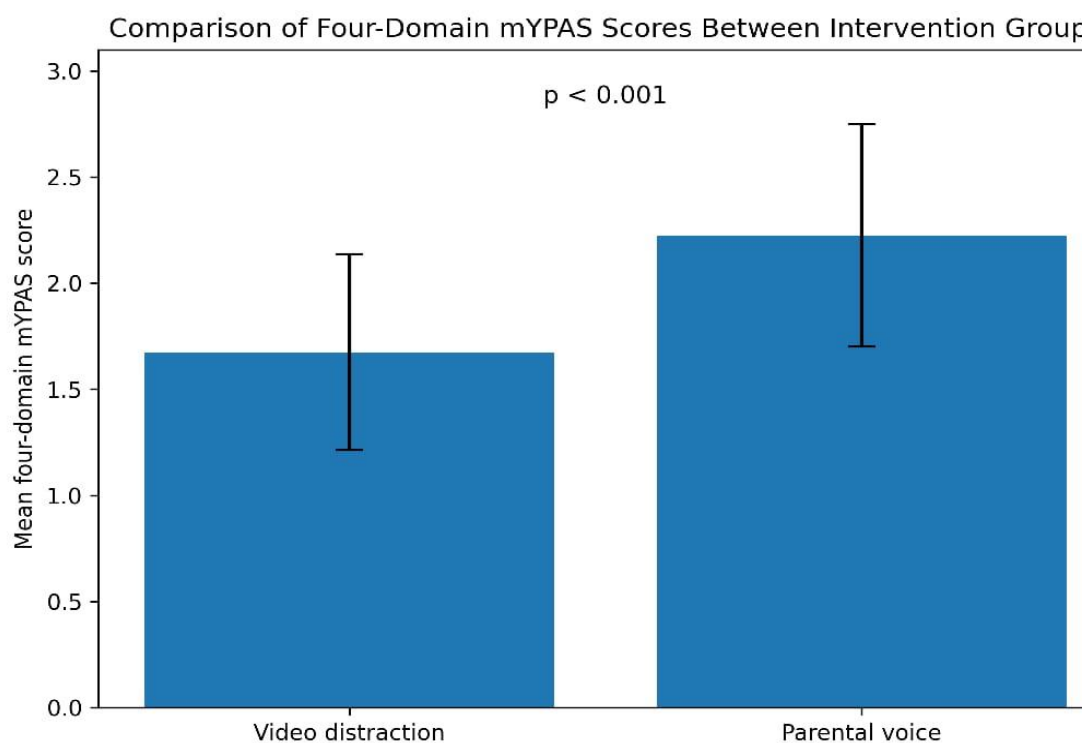


Figure 1. Mean four-domain mYPAS-SF score by intervention group

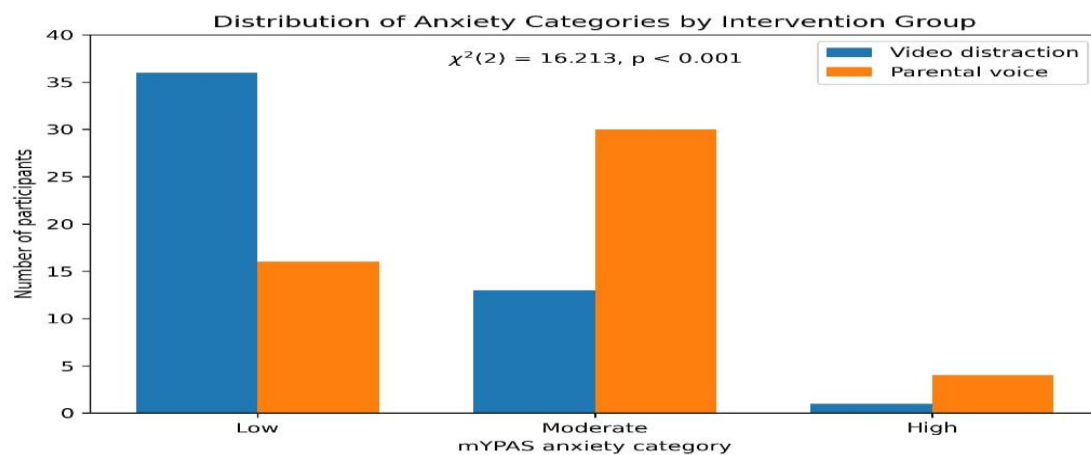


Figure2. Distribution of anxiety categories by intervention group

Discussion:

This randomized controlled trial demonstrated that video distraction was associated with lower observed preoperative anxiety than parental recorded voice among children undergoing elective surgery. The mean Modified Yale Preoperative Anxiety Scale-Short Form (mYPAS-SF) score was 1.68 ± 0.46 in the video distraction group compared with 2.23 ± 0.52 in the parental recorded voice group, corresponding to a mean difference of -0.55 (95% CI, -0.746 to -0.354 ; $p < 0.001$). The standardized effect size was large (Cohen's $d = 1.12$), indicating a substantial difference in observed anxiety between the two intervention groups. These findings suggest that the type of non-pharmacological intervention used during the preoperative period may influence children's observable anxiety.

Preoperative anxiety in children is influenced by multiple developmental, psychological, and environmental factors. Separation from caregivers, unfamiliar surroundings, fear of pain, and anticipation of anesthesia and surgery may all contribute to heightened anxiety. Individual temperament may also influence how children respond to the perioperative environment. Chow et al. reported an association between temperament and preoperative anxiety in pediatric patients, highlighting the importance of individual behavioral characteristics when considering anxiety management strategies.¹ Preoperative anxiety is clinically relevant because it may adversely affect the child's perioperative experience and can be associated with less favorable perioperative outcomes.² Therefore, simple and feasible interventions that can be incorporated into routine pediatric perioperative care remain important.

The lower anxiety observed in the video distraction group may be explained by the ability of audiovisual material to engage the child's attention through simultaneous visual and auditory stimulation. An age-appropriate cartoon or video may redirect attention away from unfamiliar surroundings, healthcare personnel, and other anxiety-provoking stimuli. In contrast, a recorded parental voice provides primarily auditory reassurance and may not maintain the same level of sustained attentional engagement. Previous research has

demonstrated that audiovisual and other distraction-based interventions can reduce preoperative anxiety in children.^{4,7,9} A recent randomized controlled trial by Bandyopadhyay et al. also evaluated video distraction in children undergoing ophthalmic procedures and reported favorable effects on preoperative anxiety compared with parental presence alone.⁹ The present findings are consistent with previous research examining audiovisual distraction in pediatric perioperative settings. Wang et al. investigated preoperative video distraction among preschool children undergoing strabismus surgery and evaluated perioperative outcomes, including emergence delirium.⁶ Bandyopadhyay et al. reported lower preoperative anxiety scores among children receiving video distraction during ophthalmic daycare procedures.⁹ Kim et al. similarly investigated video distraction in combination with parental presence and reported beneficial effects on perioperative anxiety and postoperative behavioral outcomes.⁷ Although differences exist among these studies regarding age groups, surgical populations, intervention protocols, and outcome measures, their findings provide support for the potential usefulness of video-based distraction in pediatric perioperative care.

The findings are also consistent with broader evidence concerning non-pharmacological approaches to pediatric anxiety management. Li et al., in a systematic review and Bayesian network meta-analysis, evaluated multiple non-pharmacological interventions used during anesthesia induction and found evidence supporting their potential role in reducing anxiety among children.⁴ Such interventions may be particularly attractive because they can be implemented without exposing children to the potential adverse effects associated with pharmacological anxiolysis. Although pharmacological premedication remains an important component of pediatric anesthesia practice, non-pharmacological approaches may serve as useful adjuncts to routine care when clinically appropriate.

An important aspect of the present study is the direct comparison between video distraction and parental recorded voice. A parent's voice may provide familiarity and emotional

reassurance during an unfamiliar healthcare experience. Avighan et al. reported beneficial effects of a mother's recorded voice on anxiety and postoperative pain in children undergoing surgery.⁸ However, the present study compared this auditory intervention with an audiovisual intervention specifically designed to engage the child's attention. The lower anxiety scores observed in the video distraction group suggest that sustained attentional engagement may have provided greater benefit than auditory reassurance alone in this particular preoperative setting. This finding should not be interpreted as evidence that parental involvement is ineffective. Rather, it suggests that different non-pharmacological interventions may vary in effectiveness depending on the degree to which they engage the child and redirect attention from anxiety-provoking stimuli.

The categorical analysis further supported the primary finding. Low anxiety was observed in 36 (72.0%) children in the video distraction group compared with 16 (32.0%) children in the parental recorded voice group. Moderate anxiety occurred in 13 (26.0%) and 30 (60.0%) children, respectively, while high anxiety was observed in 1 (2.0%) and 4 (8.0%) children, respectively. The distribution of anxiety categories differed significantly between the groups (Pearson's $\chi^2(2) = 16.213$, $p < 0.001$), with a Cramer's V of 0.403, indicating a moderate association between intervention group and anxiety category. Thus, the difference between the interventions was apparent both when anxiety was analyzed as a continuous outcome and when it was examined according to predefined anxiety categories.

The study population included children undergoing procedures in several surgical specialties, including pediatric surgery, ophthalmology, otorhinolaryngology, and plastic surgery. The mean age was 7.05 ± 1.99 years, and participants were equally allocated between the two intervention groups. However, the study was not specifically powered to determine whether the effectiveness of either intervention varied according to age, sex, or surgical specialty. Therefore, the baseline characteristics should be interpreted descriptively rather than as evidence of differential treatment effects among subgroups.

An important strength of this study was the use of a standardized behavioral instrument to assess preoperative anxiety and the consistency between the continuous and categorical analyses. The mYPAS-SF was developed by Jenkins et al. as a shortened version of the Modified Yale Preoperative Anxiety Scale. The short form consists of four behavioral domains after elimination of the Use of Parents domain and was designed to facilitate assessment in clinical and research settings.¹¹ In the present study, the assessed domains were Activity, Vocalization, Emotional Expressivity, and State of Apparent Arousal. Because the Use of Parents domain was not assessed, the findings should be interpreted specifically as measurements obtained using the four-item mYPAS-SF rather than as results from the complete original five-item mYPAS.

Limitations:

Several limitations should be considered when interpreting these findings. First, the study assessed preoperative anxiety using the four-item mYPAS-SF and did not include the Use of Parents domain; therefore, direct comparison with studies using the complete original mYPAS should be made cautiously. Second, the study did not perform subgroup analyses according to age, sex, temperament, or surgical specialty and therefore could not determine whether these characteristics modified the response to either intervention. Third, the study focused on preoperative anxiety and did not evaluate other potentially important perioperative outcomes, such as cooperation during anesthesia induction, emergence delirium, postoperative pain, or postoperative behavioral changes. Fourth, the study was conducted at a single center with a relatively small sample of 100 children, which may limit generalizability to other institutions and pediatric populations. Finally, the effectiveness of video distraction may depend on factors such as the child's age, familiarity with digital media, individual preference, attention span, and the type of audiovisual content selected.

Conclusion:

In this randomized controlled trial, video distraction was associated with lower observed preoperative anxiety than parental recorded

voice among children undergoing elective surgery. Children receiving video distraction had a lower mean mYPAS-SF score, a large standardized between-group effect, and a greater proportion of participants classified as having low anxiety. These findings suggest that video distraction may represent a practical, non-pharmacological adjunct for the management of preoperative anxiety in pediatric patients. Further multicenter randomized studies should evaluate whether these effects translate into improved cooperation during anesthesia induction and favorable postoperative outcomes.

Recommendations:

Future investigations should examine whether the use of video distraction can improve children's cooperation during anesthesia induction and influence postoperative outcomes such as emergence delirium and behavioral disturbances. Additional research should explore whether age, temperament, individual preferences, and the characteristics of the selected video affect the response to the intervention. Larger randomized studies conducted across multiple centers would also be valuable for confirming the findings and establishing their applicability to a wider range of pediatric surgical settings.

CONFLICT OF INTEREST

There is no conflict of interests to declare.

Ethical Approval:

Ethical approval was obtained from the Institutional Ethical Review Committee of King Edward Medical University/Mayo Hospital, Lahore (Approval No. 552/RC/KEMU) before the study commenced. Written informed consent was obtained from the parents or legal guardians of all participating children before enrollment. Participation was voluntary, and parents or legal guardians were informed that they could withdraw their child from the study at any stage without affecting the child's standard medical care. Participant confidentiality was maintained throughout the research process. Unique identification numbers were used for study participants, and collected information was stored securely. Personal identifiers were not used in the

statistical analysis or presentation of the study findings.

REFERENCE:

- Chow CHT, Rizwan A, Xu R, Poulin L, Bhardwaj V, Van Lieshout RJ, et al. Association of temperament with preoperative anxiety in pediatric patients undergoing surgery: a systematic review and meta-analysis. *JAMA Netw Open*. 2019;2(6):e195614.
- Shebl MA, Toraih E, Shebl M, Mosaad Tolba A, Ahmed P, Banga HS, et al. Preoperative anxiety and its impact on surgical outcomes: a systematic review and meta-analysis. *J Clin Transl Sci*. 2025;9(1):e33.
- Heikal S, Stuart G. Anxiolytic premedication for children. *BJA Educ*. 2020;20(7):220-225.
- Li Y, Peng S, Xia X, Yin L, Liao L. Nonpharmacological interventions for decreasing anxiety during anesthesia induction in children: a systematic review and Bayesian network meta-analysis. *BMC Anesthesiol*. 2025;25:226.
- Yucedag F, Sezgin A, Bilge A, Basaran B. The effect on perioperative anxiety and emergence delirium of the child or parent's preference for parental accompaniment during anesthesia induction in children undergoing adenotonsillectomy surgery. *Paediatr Anaesth*. 2024;34(8):792-799.
- Wang Y, Chu L, Li H, Du Y, Wang S, Liu Y, Wang G. The use of preoperative video distraction on emergence delirium in preschool children undergoing strabismus surgery under anesthesia with sevoflurane: a randomized controlled trial. *Ther Clin Risk Manag*. 2024;20:217-225.
- Kim H, Jung SM, Yu H, Park SJ. Video distraction and parental presence for the management of preoperative anxiety and postoperative behavioral disturbance in children: a randomized controlled trial. *Anesth Analg*. 2015;121(3):778-784.

- Avighgan F, Ghaljaei F, Jalalodini A, Navidian A. The effectiveness of mother's recorded voice on the pain and anxiety in pediatric undergoing surgery: a randomized clinical trial study. *Int J Pediatr*. 2021;9(2):13067-13075.
- Bandyopadhyay S, Kaur M, Sinha R, Muthiah T, Ayub A, Subramaniam R. Effect of video distraction on preoperative anxiety scores in pediatric patients undergoing general anesthesia in ophthalmic daycare procedures: a randomized controlled trial. *J Anaesthesiol Clin Pharmacol*. 2024;40(1):133-139.
- Chow CH, Van Lieshout RJ, Schmidt LA, Dobson KG, Buckley N. Systematic review: audiovisual interventions for reducing preoperative anxiety in children undergoing elective surgery. *J Pediatr Psychol*. 2016;41(2):182-203.
- Jenkins BN, Fortier MA, Kaplan SH, Mayes LC, Kain ZN. Development of a short version of the modified Yale Preoperative Anxiety Scale. *Anesth Analg*. 2014;119(3):643-650.

