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ORIGINAL RESEARCH

The effect of a preoperative patient information video on child and caregiver anxiety: a prospective, non-randomised, controlled study

N Nkosi,[1] P Maré,[2] DG Bishop,[3] C Rajah[1]

[1] *Department of Anaesthetics, Critical Care and Pain Management, University of KwaZulu-Natal, South Africa*
[2] *Department of Orthopaedic Surgery, University of KwaZulu-Natal, South Africa*
[3] *Perioperative Research Group, Department of Anaesthetics, Critical Care and Pain Management, University of KwaZulu-Natal, South Africa*
Corresponding author, email: *nb.nkosie@gmail.com*

Background: Preoperative anxiety is common in paediatric patients and associated with significant adverse postoperative outcomes. Video techniques to alleviate preoperative anxiety are effective in adult patients, whilst there is variable evidence in children. In our setting, there is limited evidence demonstrating a similar impact on paediatric patients and their caregivers.

Methods: This was a prospective, non-randomised, controlled study to determine if exposure to a preoperative anaesthetic information video reduces anxiety levels in paediatric patients and their caregivers before surgery, compared to those who had routine preoperative counselling. A video was shown before the theatre, and a clip of the same video was shown pre-induction. Paediatric anxiety was assessed in the waiting area (T0) and at induction (T1) using the modified Yale Preoperative Anxiety Scale (mYPAS) for the child and the 6-point State-Trait Anxiety Inventory (STAI-6) for the caregiver.

Results: A total of 173 participants were included, 90 in the control group and 83 in the intervention group. The demographics of the groups were similar, except for the control group having younger patients (median [interquartile range, IQR], 6 [3–8] vs. intervention group 7 [5–9.75]; $p = 0.03$). Caregivers experienced a similar incidence of "high anxiety" in the control and intervention groups (59/90 [66%] vs. 61/83 [73%]; $p = 0.52$). There was no significant difference in median (IQR) STAI-6 scores between groups (control group 50.0 [43.4–53.5] and intervention group 50.0 [43.4–53.5]; p = 0.32). We also did not find a significant difference in the median (IQR) childhood anxiety measured by the mYPAS between groups at either T0 (39.6 [27.1–50.0] vs. 33.3 [22.9–45.8]; $p = 0.107$), or T1 (39.6 [33.3–53.6] vs. 39.6 [27.1–50.0]; $p = 0.386$).

Conclusion: A preoperative information video did not alter caregiver or child anxiety in our study. While we believe the video is an invaluable tool for education, consistent counselling, and information provision to patients in a familiar language, it does not demonstrably impact perioperative anxiety in our setting.

Keywords: modified Yale Preoperative Anxiety Scale, STAI-6, paediatric anxiety, parental anxiety, information videos, education videos

Introduction

Preoperative anxiety is common in paediatric patients and is associated with significant adverse postoperative outcomes, including negative emotional and behavioural responses, increased analgesic requirements, and prolonged recovery room stay.[1,2] Different techniques are employed to prevent and alleviate preoperative anxiety. These include non-pharmacological interventions, such as establishing patient rapport, distraction, caregiver presence at induction, and pharmacological techniques, such as administration of sedative premedication.[3-5]

Video techniques to reduce preoperative anxiety are effective and widely used in adult patients.[6,7] Advancing technology, such as smartphones, has led to its use in the paediatric population. Video interventions in children include a demonstration of induction, games, and music.[8-10] These audiovisual techniques allow distraction and reinforce cognitive coping mechanisms to deal with the uncertainty and the perceived threats of an unfamiliar theatre environment. However, there is a paucity of evidence demonstrating the impact of these interventions on our population. The prospective, non-randomised, controlled study aimed to determine if exposure to a preoperative anaesthetic information video in isiZulu or English would reduce anxiety levels in paediatric patients and their caregivers before surgery compared with anxiety levels in those who had routine verbal preoperative counselling.

Methods

The study was approved by the University of KwaZulu-Natal (UKZN) Biomedical Research Ethics Committee (BREC/00005349/2023). This single-centre study of children and their caregivers at Greys Hospital was based in Pietermaritzburg, KwaZulu-Natal, South Africa. The study consisted of two sequential recruitment phases. All children between the ages of two and 12 years without neurological impairment, undergoing elective general surgery, orthopaedic surgery, plastic surgery, burns, ear, nose, and throat (ENT) surgery, and ophthalmology surgery were invited to participate in the study. Patients younger than two or older than 12 years, with current neurological impairment, or previously enrolled in the study were excluded from participation. The day before surgery, all patients and their caregivers enrolled in the study gave written consent, or assent

from children six years and older, in isiZulu or English. Illiterate patients had the form read out to them by research assistants in the department.

Data were collected between July and November 2023. Phase I patients recruited from July to August (control group) received routine verbal preoperative counselling from anaesthetists not part of the investigating team. Phase II patients recruited from September to November (intervention group) received similar routine preoperative counselling and watched a narrated isiZulu or English information video on a smartphone/tablet in the ward. Phase I study participants were excluded from participation in phase II.

The video was narrated by the same isiZulu and English-speaking anaesthetist and reviewed by five isiZulu-speaking nursing and medical staff to ensure clear and understandable audio commentary. The caregiver and patient depicted in the video provided written consent to the recording and its use during the study period. The video content follows the journey of a paediatric patient and their caregiver from the preoperative visit to the waiting area of the theatre to on-table inhalational induction.

The child and caregiver were asked to state their home language and select their preferred language of communication between isiZulu and English as the video's narration language. The video was played during the preoperative visit in addition to routine information. The research assistant met the child and caregiver in the preoperative waiting area on the day of surgery. The STAI-6 scoring sheet was completed by the caregiver at this point, assisted by a research assistant. This was read out to the caregiver if they were illiterate. The research assistant assessed and noted the mYPAS by observation. This was considered T0 in the study. When the child was in theatre pre-induction, the video segment showing the on-table induction was shown again (T1). The mYPAS was reassessed by the research assistant as the child was induced.

Junior doctors in the department not directly involved in the case were trained as research assistants to collect data to reduce bias. These research assistants received a 20-minute formal lecture on taking consent, assent, and data collection by the investigators. A data collection paper sheet, including the STAI-6 and mYPAS, was used to collect data. Coded numbers were used instead of patients' names to ensure anonymity and confidentiality. Only the senior investigators had access to the raw data.

Caregiver anxiety was assessed using the STAI-6.[11,12] This score has been translated and used in various languages, but to our knowledge, not isiZulu.[11] Most paediatric surgery patients at Greys Hospital are fluent in either isiZulu or English. The UKZN Department of Zulu Language and Literature translated the STAI-6 from English into isiZulu. The STAI-6 score is a self-reported, validated score for anxiety assessment and is widely accepted as the definitive instrument for measuring anxiety in adults.[12,13] Compared with the full form of the STAI, the 6-item version offers a brief (less than five minutes to complete) but acceptable scale for subjects while maintaining comparable results.[10]

STAI-6 scores (20–80) are commonly classified as "no or low anxiety" (20–37), "moderate anxiety" (38–44), and "high anxiety" (45–80).[14] A score ≥ 38 indicates a clinically significant state of anxiety.[14-16] Anxiety in the child (patient) was assessed using the observed mYPAS at T0 and T1. The mYPAS score ranges from 22.5 to 100. A score ≥ 30 represents significant anxiety.[17] The mYPAS is a validated tool for assessing children's anxiety during the perioperative period, showing good to excellent observer reliability, good concurrent and construct validity, and is sensitive and reliable.[17,18]

Statistical methods

Categorical descriptors were reported as numbers and proportions. Depending on the data distribution, continuous variables (STAI-6 and mYPAS) were reported as means with standard deviation or medians with IQR. For statistical analysis, jamovi version 2.3.21 was used. The median STAI-6 and mYPAS were compared between the two groups with the Wilcoxon rank-sum test. The rank-biserial correlation (r_rb) was calculated to determine the effect size, and bootstrapping was used to calculate the 95% confidence intervals (CI). A mYPAS score ≥ 30 for child anxiety and a STAI-6 score ≥ 38 for the caregiver was considered an anxious state.[14-15,17] Categorical anxiety was reported and compared using the chi-square test. Differences were considered significant when a two-sided *p*-value was less than 0.05. The primary outcome was the STAI-6 score in caregivers.

The sample size calculation was based on unpublished internal audit data of preoperative anxiety in caregivers of children undergoing surgery measured by the STAI-6 at our institution in 2022. A mean STAI-6 score of 43 was found in 51 caregivers. A total of 126 subjects (63 participants per group) were calculated to be required to detect a clinically significant difference of 5 between the STAI-6 scores of the two groups, with an alpha value of 0.05 and a power of 0.8.

Results

During the study period, 215 participants were eligible and recruited; all consented to participate, and 42 patients were excluded (Figure 1). There were 90 participants in the control group and 83 in the intervention group (Figure 1). Language preference showed that 90% of the participants were first-language isiZulu speakers, corresponding to 90% selecting the isiZulu video narration. The descriptive characteristics of both groups are presented in Table I. The sex and type of surgery were similar, but the median age in the intervention group was higher than in the control group.

The results of the STAI-6 were extrapolated to a score between 20 and 80.[14-16] Caregiver anxiety levels were high in both control and intervention groups, as shown in Table II.

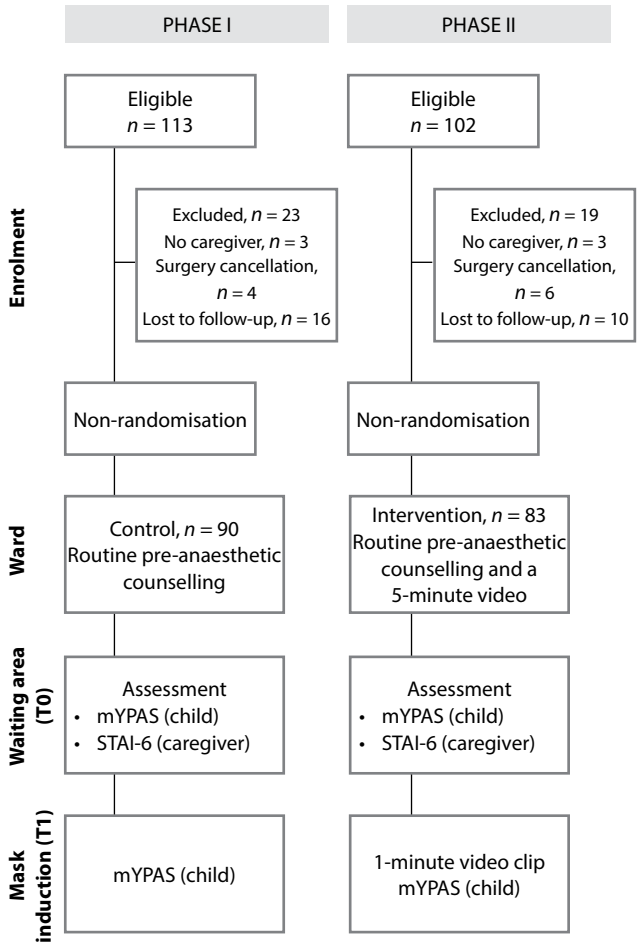

Figure 1: Flowchart of the recruitment process

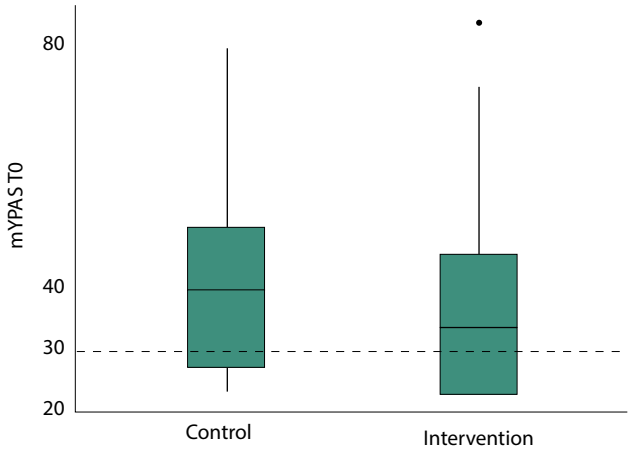

Figure 2: Within-group difference between mYPAS scores in the waiting area (T0)

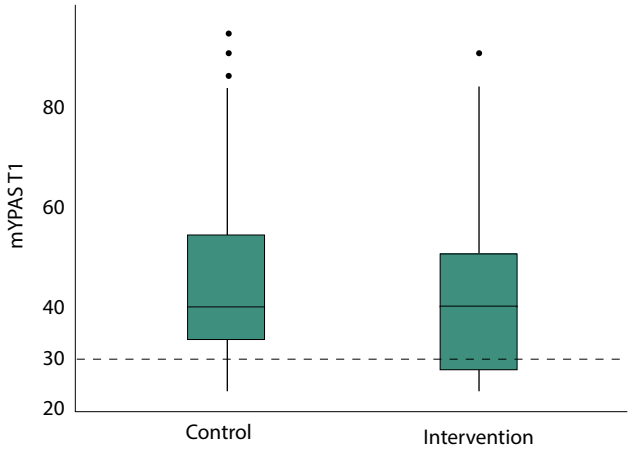

Figure 3: Within-group difference between mYPAS scores at induction (T1)

Table I: Descriptive data in the control and intervention groups

	Control group *n* = 90	Intervention group *n* = 83	*p*-value
Patient age (years)	**6 (3–8)**	**7 (5–9)**	**0.046**[a]
Female sex	30 (33)	32 (39)	0.474[b]
Type of surgery			
Surgery	34 (38)	31 (37)	0.954[b]
Orthopaedics	24 (27)	26 (31)	0.499[b]
Burns	8 (9)	3 (4)	0.155[b]
ENT	10 (11)	10 (12)	0.847[b]
Plastic surgery	7 (8)	9 (11)	0.487[b]
Ophthalmology	7 (8)	5 (6)	0.650[b]

Results are median (IQR) or number (%).
[a] Mann–Whitney U test, [b] chi-square test
ENT – ear, nose, and throat

For the primary outcome, the groups had no significant difference in median (IQR) STAI-6 scores (Table II). The r_rb of 0.078 (95% CI -0.148 to 0.188) suggests a weak intervention effect on the STAI-6. The CI spans zero, supporting the Wilcoxon rank-sum test's non-significant *p*-value ($p = 0.372$).

There was no significant difference between the median mYPAS score of the control and intervention groups at T0 or T1 (Table III, Figures 2 and 3). At T0, the r_rb (-0.141, 95% CI -0.155 to 0.189) indicated a small negative effect of the video on mYPAS scores. However, the CI spanned zero, and the Wilcoxon rank-sum test *p*-value ($p = 0.107$) confirmed it was not statistically significant. At T1, the findings were similar, with the r_rb (-0.076, 95% CI -0.155 to 0.182) indicating a negligible negative effect of the

Table II: Caregiver anxiety outcomes

Anxiety level (STAI-6 score range)	Control group *n* = 90	Intervention group *n* = 83	*p*-value	Effect size[c]
No or low anxiety (20–37)	9 (10)	7 (8)		
Moderate anxiety (38–44)	22 (24)	15 (18)	0.515[a]	
High anxiety (45–80)	59 (66)	61 (73)		
STAI-6 scores	50.0 (43.4–53.5)	50.0 (43.4–53.5)	0.372[b]	r_rb = 0.078

Results are number (%) or median (IQR).
[a] chi-square test, [b] Wilcoxon rank-sum test, [c] rank-biserial correlation
r_rb – rank-biserial correlation, STAI-6 – 6-point State-Trait Anxiety Inventory

Table III: Paediatric (patient) anxiety outcomes

mYPAS	Control group *n* = 90	Intervention group *n* = 83	*p*-value	Effect size
T0 ≥ 30	66 (73)	53 (64)	0.179[a]	
T1 ≥ 30	71 (79)	60 (72)	0.312[a]	
T0	39.6 (27.1–50.0)	33.3 (22.9–45.8)	0.107[b]	r_rb = -0.141
T1	39.6 (33.3–53.6)	39.6 (27.1–50.0)	0.386[b]	r_rb = -0.076

Results are number (%) and continuous nonparametric data reported as median (IQR).
[a] chi-square test, [b] Wilcoxon rank-sum test
mYPAS – modified Yale Preoperative Anxiety Scale, r_rb – rank-biserial correlation, T0 – waiting area, T1 – at induction

video on mYPAS scores. The CI again spanned zero, and the Wilcoxon rank-sum test *p*-value ($p = 0.386$) confirmed it was not statistically significant.

A Wilcoxon signed-rank test indicated a significant difference in the mYPAS score within the control group between T0 and T1 ($p = 0.035$). The effect size, measured using r_rb, was 0.27 (95% CI 0.12 to 0.41), suggesting a small to moderate increase in anxiety at T1. Similarly, a moderate increase in anxiety was measured within the intervention group at T1 compared with T0 (r_rb = 0.36, 95% CI 0.21 to 0.50; $p = 0.013$). There was no significant difference in the magnitude of increase in the mYPAS score from T0 to T1 between the control and intervention groups (r_rb = 0.02, 95% CI -0.14 to 0.18; $p = 0.811$).

The age difference between the control and intervention groups was an unanticipated finding and a possible cause of bias. We performed propensity score matching to analyse whether age had a significant confounder treatment effect. There was no significant change in the average treatment effect of the intervention on the STAI-6 (coefficient = 1.64, 95% CI -0.96 to 4.23; $p = 0.217$), the mYPAS at T0 (coefficient = -2.48, 95% CI -6.71 to 1.75; $p = 0.250$), or the mYPAS at T1 (coefficient = -2.01, 95% CI -7.38 to 3.35; $p = 0.462$).

Discussion

Our study found no significant difference in anxiety levels in either patients or their caregivers after a video preparation intervention in their preferred language. Existing literature has shown contradictory evidence for the impact of video interventions in reducing anxiety in patients undergoing surgery.[8-10] Our findings were consistent with similar randomised controlled trials in paediatric patients, where no difference in anxiety was observed between the control and intervention groups.[8,20] These studies showed that while patients receiving a video intervention plus standard information reported fewer worries than those receiving standard information only, there was no significant anxiety reduction.[8] Further, anxiety was significantly reduced in both groups, but there was no significant between-group difference.[8,20] Other studies have shown that anxiety levels before anaesthesia were reduced in adult patients receiving video interventions.[7,9] Our findings were not in keeping with these studies but were consistent with studies suggesting that viewing a video for detailed anaesthesia education does not change patient anxiety but improves patient knowledge.[19-21]

The investigating team observed that the patient population received the video positively and would often suggest sharing it with other patients awaiting surgery in the ward. Nurses also endorsed it, as they perceived it helpful in reducing translation needs in busy paediatric wards. This study did not formally investigate these, and future studies may investigate caregivers' and nurses' perceptions of educational videos. The general reception from the anaesthetists was that the video was convenient, as it can be shown on one's smartphone during the preoperative visit, and they have continued showing it beyond the study period. It is a helpful tool in bridging the doctor-patient language gap. This type of intervention can be easily distributed to surrounding hospitals and healthcare providers.

We consider the preoperative video a valuable tool for empowering patients with knowledge of the upcoming procedure in their home language, as demonstrated by other studies that found knowledge improvement among participants exposed to a preoperative information video.[22,23] We did not test knowledge retention between the groups. A further study is required to determine the value of a preoperative information video, including patient satisfaction measurements.

Several possible limitations may be considered for our findings. Firstly, our tools for measuring anxiety might not have been adequate. The STAI-6 is used as the gold standard for measuring preoperative anxiety in adults.[11] We used an isiZulu translation of the STAI-6 for the isiZulu caregivers (90% of participants). The English version is a validated tool, but accurate translation maintaining the intended meaning can be challenging and might lead to loss of interpretation, especially in the isiZulu language, where certain English terms do not have an isiZulu equivalent. We sought to mitigate this risk by using a university-based language service and testing it with five first-language isiZulu nurses.

Secondly, the physical interaction with the anaesthetist might be more impactful than an additional video. We observed that children who had seen the video would voluntarily mimic the child on the video by holding their own anaesthetic mask or asking the caregiver to do so. Consequently, the video might aid the anaesthetist's explanation without necessarily influencing anxiety levels.

A video preparation provides information but may not directly address caregiver fears, which may significantly contribute to the child's preoperative emotional state and level of anxiety.

Le Roux et al.[25] showed that a lack of information was not the cause of fear in caregivers, an important consideration in our population group. Additionally, children whose caregivers feel anxious experience an increased risk of preoperative anxiety compared with children whose caregivers are not anxious about the surgery.[24,26]

Moreover, the effect of culture and beliefs on perioperative anxiety has been described in our context.[25] Cultural beliefs and practices affect how families interpret surgical interventions, often shaping a child's expectations and emotional reactions. This finding is important when comparing results from different cultures and beliefs. Our study did not investigate this aspect, and it is a research topic for future studies.

Another limitation of this study is that compliance with mask induction was not measured.[26] Our study revealed an increase in anxiety between T0 and T1 in both groups, similar to other studies.[9] A 2023 randomised controlled study found that interactive, multimedia-based, home-initiated education improves the quality of anaesthesia induction, and the percentage of children with perfect induction compliance in the intervention group was significantly higher than in the control group.[9] Measuring mask compliance may have objectively shown that video interventions improve induction without affecting anxiety.

Finally, previous studies on preoperative videos used different videos (non-standardised) with varying methods of relaying the information. No existing syntheses or reviews are dedicated to elucidating the effects and mechanisms of audiovisual material in reducing children's preoperative anxiety.[27] This might be a significant limitation when comparing results.

Our patients need access to information, which is currently a challenge in the public sector. Most of our patients come from poor socio-economic backgrounds and do not have internet access or the means of accessing resources on what to expect in the operating theatre. We believe that this video could be a tool to assist with education, counselling, and consenting our patients in a language they understand. It could be routinely offered to patients when surgery is scheduled, allowing for more meaningful discussions at the in-hospital preoperative visit.

Conclusion

Our study found that a preoperative information video did not change caregiver anxiety as measured by the STAI-6 or child anxiety as measured by the mYPAS score. This study's findings inform the reader to expect and plan for persistent caregiver and child anxiety despite thorough preoperative information, even if that includes a video demonstration. The use of additional non-pharmacological and pharmacological means should be considered for preoperative anxiety control.

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Conflict of interest

The authors declare no conflict of interest.

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Ethical approval

Ethical approval was obtained from the University of KwaZulu-Natal Biomedical Research Ethics Committee (BREC/00005349/2023) before study commencement.

ORCID

N Nkosi https://orcid.org/0009-0004-1411-9018
P Maré https://orcid.org/0000-0003-1599-7651
DG Bishop https://orcid.org/0000-0001-9861-3646
C Rajah https://orcid.org/0000-0002-6338-4721

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