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Influence of Parental Anxiety on Their Child Undergoing Elective Surgery under General Anaesthesia: An Observational Study

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ABSTRACT:
Background: Preoperative anxiety affects both children and their parents and can negatively influence surgical outcomes. Parental stress related to anaesthesia and surgery is often sensed by children and may increase their preoperative anxiety. Children's anxiety is multifactorial and influenced by parental behaviour, sociodemographic factors and psychological characteristics.This observational study aims to assess the correlation between parental preoperative anxiety and anxiety in paediatric patients aged 1–6 years undergoing elective surgery under general anaesthesia. A secondary objective was to identify factors contributing to anxiety in both parents and children.
Methods: An observational study was conducted in children aged 1–6 years undergoing elective surgery under general anaesthesia. On the day of surgery, parents completed a sociodemographic form and the State-Trait Anxiety Inventory (STAI) to assess parental anxiety.Children's preoperative anxiety was evaluated using the modified Yale Preoperative Anxiety Scale (mYPAS). Sociodemographic variables and type of surgery(major/minor) was recorded.
Results: A strong positive correlation was found between STAI-State scores and m-YPAS scores($r=0.718$, $p<0.001$) and between STAI-Trait scores and m-YPAS scores ($r=0.649$, $p<0.001$).These results indicate that higher levels of parental anxiety, both state and trait, aresignificantly associated with higher levels of child anxiety in the preoperative period.
Conclusion: The results demonstrate a strong positive correlation between parental anxiety and child anxiety in the preoperative period. However, no significant associations were found between anxiety scores and factors such as the child's gender, type of surgery, previous hospitalization, previous surgery, child's age, or parent's age.

Keywords: Paediatric anxiety; Parental anxiety; Preoperative anxiety; m-YPAS; STAI; Elective surgery; General anaesthesia; Toddlers; Preschool children; Anxiety correlation; Perioperative care.

I. INTRODUCTION

Surgery is a traumatic experience for both parents and their children. Parents go through a lot of anxiety and stress concerning their child's anaesthesia, surgery and it's complications and children experience lot of fear, irritability during pre operative period. Parental anxiety can be sensed by their children and may increase the anxiety in children [1,2] Parents' emotional behaviours and coping mechanisms impact their children, who model their behaviour after that of their parents. [3,4]

Preoperative anxiety is related to patients' social demography, family characteristics and parental psychological characteristics. A previous study reported that maternal education level had an impact on the anxiety of their children. [5]

The causative factors and manifestations of perioperative anxiety and the coping skills of the individual in stressful situations are very much influenced by the sociocultural aspects of the society and country. [6,7] Preoperative anxiety in children is multifactorial. In developed countries, parents' anxiety is known to influence their children's anxiety, which can affect the perioperative outcome of children.

To study any such correlation in developing countries, the present observational study is planned with the primary objective of analysing the correlation between parents' and their children's anxiety preoperatively in paediatric patients aged 1-6yrs (toddlers and preschool) posted for elective surgery under general anaesthesia.

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The secondary objective of our study will be to determine the factors influencing anxiety among parents and their children. We shall hypothesis that there is a positive correlation between preoperative parental anxiety and their child's preoperative anxiety in paediatric patients undergoing elective surgeries under general anaesthesia.

II. AIMS AND OBJECTIVES

PRIMARY OBJECTIVE

To analyse the correlation between parents' and their children's anxiety preoperatively in paediatric patients aged 1-6yrs posted for elective surgery under general anaesthesia.

SECONDARY OBJECTIVE

To determine the factors influencing anxiety among parents and their children.

III. MATERIALS AND METHODS

This is an observational study conducted in Sapthagiri Institute of MedicalSciences And R research Centre, Bengaluru, Karnataka over 6months period.The sample size was calculated from a study by Kumari K et al who reported the correlation between the study parameters (m-YPAS and STAI) as 0.545 In children 2–12 years of age.Considering this for sample size calculation, we estimated the sample size to be 25 at a 95% confidence interval (CI), 90% power, and 10% contingency for dropouts. Statistical analysis was done using G*power 3.1.9 statistical software.

Children in age group 1-6yrs (toddlers and preschool) belonging to American Society of Anesthesiologists physical status I or II scheduled for elective surgeries under general anaesthesiawere included in the study.

Children posted for elective surgery under regional anaesthesia, children with congenital disorders or developmental abnormalities,children with a history of significant chronic respiratory, central nervous bsystem or cardiovascular system disease,children whose parents were not able to understand and answerthe Spielberger State–Trait Anxiety Inventory (STAI)questionnaire in Kannada or English were excluded from the study

IV. METHODOLOGY

During the preoperative assessment, an explanation about the anaesthesia and the surgery was given to the parent accompanying the child to the preoperative area, and the same parentfilled out the demographic questionnaire and the STAI form in the preoperative area on the day of surgery.

The STAI questionnaire [9] consists of 20 questions for assessing state and trait anxiety. Scores on this questionnaire range from 20 to 80, with higher scores indicating elevated levels of anxiety.

The child's behaviour and anxiety was assessed in the preoperative area before separation from parents using the modified Yale Preoperative Anxiety Scale (m-YPAS) by the anaesthesiologist, [10] which has five domains: (1) activity, (2) vocalisations, (3) emotional expressivity, (4) state of apparent arousal and (5) use of a parent.

The score ranges from 23 to 100; the higher the score, the higher the anxiety level. Sociodemographic data of the child and the parent, like age of the child and the parent, gender, birth order of the child, educational qualification of the parent and the child, previous surgical history, area of residence and type of surgery was noted. (major surgery was defined as an invasive procedure in which a body cavity was entered, the mesenchymal barrier was crossed, the fascial plane was opened or an organ removed, and minor surgery was defined as an invasive procedure in which only skin, mucous membranes or superficial connective tissue was manipulated), The child was not given any premedication before the assessment of anxiety scores.

IV access would be secured in the ward before the day of surgery. After the assessment, the child was given premedication (IV ketamine 0.5 mg/kg) and will shifted to the operation theatre, where he/she was given routine general anaesthesia as per the standard protocol of the institute. Parents were not present inside the operation theatre during anaesthesia induction.

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V. RESULTS

Table 1: Sociodemographic characteristics of the study participants

Characteristic	Value
Age of the child (mean ± SD)	4.65 ± 2.14 years
Age of the parent (mean ± SD)	30.38 ± 3.49 years
Gender of the child (M/F)	21 (80.8%) / 5 (19.2%)
Gender of the parent (Mother/Father)	21 (80.8%) / 5 (19.2%)
Education level of the parent:	
- 5th std	1 (3.8%)
- 7th std	1 (3.8%)
- 10th std	2 (7.7%)
- 2nd std	1 (3.8%)
- Degree	7 (26.9%)
- Diploma	8 (30.8%)
- PUC	6 (23.1%)
Type of surgery (Major/Minor)	12 (46.2%) / 14 (53.8%)
Previous hospitalization (Yes/No)	8 (30.8%) / 18 (69.2%)
Previous surgery (Yes/No)	8 (30.8%) / 18 (69.2%)
Place of residence:	
- Urban (Bangalore)	16 (61.5%)
- Rural	10 (38.5%)
Birth order of the child:	
1	16 (61.5%)
2	9 (34.6%)
3	1 (3.8%)

The study included 26 pediatric patients aged 1-6 years scheduled for elective surgery under general anesthesia. The sociodemographic characteristics of the study participants are presented in Table 1.

The mean age of the children was 4.65 ± 2.14 years, and the mean age of the parents was 30.38 ± 3.49 years.Themajority of the children were male (80.8%), and most of the parents accompanying the children were mothers (80.8%). The education level of the parents varied, with the highest proportion having a diploma (30.8%), followed by a degree (26.9%) and PUC (23.1%). The type of surgery was nearly equally distributed between major (46.2%) and minor (53.8%) procedures. Previous hospitalization and surgery were reported in 30.8% of the children. The majority of the participants resided in urban areas (61.5%), while 38.5% were from rural areas. Most of the children were the first-born (61.5%), followed by second-born (34.6%) and third-born (3.8%).

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Table 2: Descriptive statistics of anxiety scores

Anxiety Score	Mean ± SD	Range
m-YPAS	39.08 ± 11.18	23 - 58
STAI-State	54.62 ± 10.26	36 - 68
STAI-Trait	54.58 ± 11.14	28 - 68

The descriptive statistics of anxiety scores are presented in Table 2. The mean m-YPAS score, which assesses child anxiety, was 39.08 ± 11.18, with a range of 23 to 58. The mean STAI-State and STAI-Trait scores, which measure parental anxiety, were 54.62 ± 10.26 and 54.58 ± 11.14, respectively. The STAI-State scores ranged from 36 to 68, while the STAI-Trait scores ranged from 28 to 68.

Table 3: Correlation between parental anxiety (STAI scores) and child anxiety.

Correlation	Coefficient	p-value
STAI-State vs. m-YPAS	0.718	<0.001
STAI-Trait vs. m-YPAS	0.649	<0.001

The correlation between parental anxiety (STAI scores) and child anxiety (m-YPAS scores) is presentedinTable3. A strong positive correlation was found between STAI-State scores and m-YPAS scores (r=0.718, p<0.001) and between STAI-Trait scores and m-YPAS scores (r=0.649, p<0.001). These results indicate that higher levels of parental anxiety, both state and trait, are significantly associated with higher levels of child anxiety in the preoperative period.

Table 4: Comparison of anxiety scores based on child's gender

Anxiety Score	Male (n=21)	Female (n=5)	p-value
m-YPAS	38.57 ± 11.52	41.20 ± 10.26	0.632
STAI-State	54.14 ± 10.74	56.40 ± 8.56	0.658
STAI-Trait	54.29 ± 11.88	55.80 ± 8.23	0.784
Anxiety Score	Male (n=21)	Female (n=5)	p-value
m-YPAS	38.57 ± 11.52	41.20 ± 10.26	0.632
STAI-State	54.14 ± 10.74	56.40 ± 8.56	0.658
STAI-Trait	54.29 ± 11.88	55.80 ± 8.23	0.784

Table 4 presents the comparison of anxiety scores based on the child's gender. No statistically significantdifferences were found in m-YPAS scores (p=0.632), STAI-State scores (p=0.658), or STAI-Trait scores(p=0.784) between male and female children.

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Table 5: Comparison of anxiety scores based on type of surgery

Anxiety Score	Major (n=12)	Minor (n=14)	p-value
m-YPAS	40.67 ± 11.17	37.71 ± 11.38	0.511
STAI-State	56.50 ± 10.65	53.00 ± 9.95	0.398
STAI-Trait	56.00 ± 10.44	53.36 ± 11.91	0.559

The comparison of anxiety scores based on the type of surgery is shown in Table 5. There were no statistically significant differences in m-YPAS scores (p=0.511), STAI-State scores (p=0.398), or STAI-Trait scores (p=0.559) between children undergoing major and minor surgeries.

Table 6: Comparison of anxiety scores based on previous hospitalization

Anxiety Score	Yes (n=8)	No (n=18)	p-value
m-YPAS	42.75 ± 10.11	37.50 ± 11.45	0.275
STAI-State	56.75 ± 9.74	53.67 ± 10.57	0.489
STAI-Trait	56.25 ± 9.43	53.83 ± 11.97	0.615

Table 7: Comparison of anxiety scores based on previous surgery

Anxiety Score	Yes (n=8)	No (n=18)	p-value
m-YPAS	42.75 ± 10.11	37.50 ± 11.45	0.275
STAI-State	56.75 ± 9.74	53.67 ± 10.57	0.489
STAI-Trait	56.25 ± 9.43	53.83 ± 11.97	0.615

Tables 6 and 7 present the comparison of anxiety scores based on previous hospitalization and previous surgery, respectively. No statistically significant differences were found in m-YPAS scores (p=0.275), STAI-State scores (p=0.489), or STAI-Trait scores (p=0.615) between children with and without previous hospitalization or surgery.

Table 8: Correlation between child's age and anxiety scores

Correlation	Coefficient	p-value
Child's age vs. m-YPAS	-0.188	0.358

The correlation between the child's age and anxiety scores is presented in Table 8. No significant correlation was found between the child's age and m-YPAS scores (r=-0.188, p=0.358).

Table 9: Correlation between parent's age and anxiety scores

Correlation	Coefficient	p-value
Parent's age vs. STAI-State	-0.296	0.142
Parent's age vs. STAI-Trait	-0.234	0.249

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Table 9 shows the correlation between the parent's age and anxiety scores. No significant correlations were found between the parent's age and STAI-State scores (r=-0.296, p=0.142) or STAI-Trait scores (r=-0.234, p=0.249).

VI. DISCUSSION

The present observational study evaluated the relationship between parental anxiety and preoperative anxiety in children aged 1–6 years undergoing elective surgery under general anaesthesia. The sociodemographic characteristics of the participants were comparable to similar studies in paediatric perioperative anxiety, with a predominance of male children and mothers accompanying the child on the day of surgery.

The mean m-YPAS score indicated a moderate level of preoperative anxiety among children, while parents demonstrated elevated anxiety levels reflected in their mean STAI-State and STAI-Trait scores. A key finding of this study was the **strong positive correlation between parental anxiety and child anxiety**, demonstrated by significant associations between m-YPAS scores and both STAI-State ($r = 0.718$, $p < 0.001$) and STAI-Trait scores ($r = 0.649$, $p < 0.001$). These results strongly suggest that children's preoperative anxiety is influenced by the emotional state of their parents. This is consistent with earlier research showing that parental behaviours, emotional expression, and stress cues are readily perceived by young children, who often mirror these responses in stressful situations such as surgery.

No significant differences were observed in childhood anxiety scores based on gender, type of surgery, previous hospitalization, or previous surgery. This indicates that preoperative anxiety in young children is more likely driven by immediate situational factors rather than demographic or clinical backgrounds. Similarly, parental anxiety did not vary significantly with their age, suggesting that worry surrounding a child's surgery is universally experienced across parental age groups.

Interestingly, the child's age did not correlate with anxiety scores, implying that children in the 1–6-year age group experience similar levels of distress when faced with perioperative environments, irrespective of developmental stage. This further underscores the importance of parental emotional regulation, as children may be more responsive to parental cues than to situational familiarity or past medical experiences.

Overall, the study highlights the crucial role of parental emotional state in shaping a child's preoperative experience. Targeted interventions aimed at reducing parental anxiety—such as preoperative counselling, orientation programmes, or relaxation techniques—may effectively help in reducing anxiety in paediatric patients.

VII. CONCLUSION

This study demonstrates a significant positive correlation between parental anxiety and preoperative anxiety in young children scheduled for elective surgery. Higher parental anxiety, both state and trait, is associated with increased anxiety levels in children. No significant associations were found between child anxiety and demographic factors such as age, gender, type of surgery, or previous medical experiences.

These findings underscore the importance of addressing parental anxiety as part of preoperative preparation. Implementing strategies to support and reassure parents may have a direct beneficial impact on reducing paediatric preoperative anxiety, ultimately contributing to improved perioperative outcomes and a more positive surgical experience for both children and their families.

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