

## Parental and Children Anxiety in Paediatric Dental Procedures Under General Anaesthesia

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### ABSTRACT

**Objective:** To determine factors responsible for anxiety in children and parents undergoing dental procedures under general anaesthesia.

**Study Design:** Cross-sectional study.

**Place and Duration of Study:** Department of Anaesthesia, CMH Lahore Medical College, from Sep 2019 to Feb 2020.

**Methodology:** Ninety-one children aged between 3 to 10 years were included in this study. Parental anxiety was assessed using a visual analogue scale-anxiety before induction of anaesthesia, and child's anxiety was assessed using the modified facial affective scale (3-face) at the time of induction of anaesthesia.

**Results:** Gender, school-going status and previous exposure to GA were not significant factors in predicting pre-operative anxiety in children with *p*-values of 0.399, 0.183 and 0.122, respectively. On the other hand, parental anxiety had a very strong impact on children pre-operative anxiety (*p*-value <0.001), suggesting that children of anxious parents had high pre-operative anxiety. Moreover, the personality of child also had statistical significance (*p*-value <0.001).

**Conclusion:** Non-social behavior of the child and the anxiety level of parents are major determinants of pre-operative anxiety in children undergoing dental procedures.

**Keywords:** Dental caries, Paediatric anesthesia, Paediatric dentistry, Pre-operative Anxiety.

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### INTRODUCTION

According to the Pathfinder survey conducted by World Health Organization, dental caries is the single most common chronic disease in Pakistan.<sup>1</sup> Moreover; it is one of the most prevalent oral diseases regardless of demography. Untreated dental caries in the deciduous dentition lead to delayed development of the permanent dentition.<sup>2</sup> Regardless of the duration of the procedure, most dental procedures in children are carried out under general anaesthesia. Dental fear and dental anxiety are common problems that delay children's treatment, further deteriorating the condition. Anxiety is an uncomfortable feeling of dread over anticipated events, and the body's response to anxiety is in the form of sympathetic, parasympathetic and endocrine stimulation. Apart from dental fear, the safety of anaesthetic drugs on a child's developing brain is also of increasing concern for parents.<sup>3</sup>

Dental fear and dental anxiety (DFA) refer to the strong negative feelings associated with dental treatment, irrespective of the dental phobia criteria.<sup>4</sup> Prevalence of dental fear and anxiety has been different in a

different populations ranging from 3 to 43%.<sup>5</sup> Surgery can be stressful for children since they fear parental separation, discomfort, a strange environment, and uncertainty about the procedure.<sup>6</sup>

Other factors increasing the pre-operative anxiety in children include; the history of previous hospitalization, being the only child in the family and socioeconomic status of the family.<sup>7</sup> Pre-operative anxiety in children has multiple effects on post-operative outcomes, including more extended hospital stay, increased pain and emergence of delirium.<sup>8</sup> Moreover, any unfavourable experience in such circumstances creates fear towards the medical system for the entire life and may even lead to psychological effects like post-traumatic stress disorders.<sup>9</sup>

Pre-operative factors that may lead to increased child's anxiety before dental procedures are not well studied in our country. The aim of this study was to identify the children at elevated risk of anxiety and determine its associated factors so that we can use psychological preparations and other interventions to allay anxiety and decrease the stress on families.

### METHODOLOGY

This cross-sectional study was conducted at the Department of Anaesthesiology, CMH Lahore Medical

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College, from September 2019 to February 2020. The Ethical Committee of CMH Lahore medical college approved this study (ERC letter No. 421/ERC/ CMHLMC). Informed consent was obtained from parents of children selected for this study. The sample size of 91 was calculated using a 95% confidence level, 5% margin of error and estimated dental fear related anxiety to be 6.3%.<sup>10</sup>

**Inclusion Criteria:** Children aged between 3-10 years presenting for pre-operative anaesthesia assessment to the Department of Anaesthesiology for dental procedures were selected for this study.

**Exclusion Criteria:** Children who were not accompanied by their parents or children with communication difficulties (e.g., autism spectrum disorder, Down syndrome, attention-deficient hyperkinetic disorder) were excluded from the study.

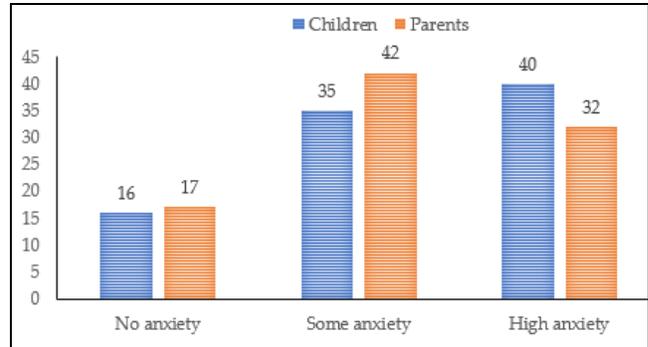
Parents were asked to mark on a scale (visual analogue scale-anxiety) corresponding to their level of anxiety before the induction of anaesthesia. Visual analogue scale-anxiety (VAS-A) is a 10 cm line where the patient's vertical line indicates his or her anxiety level. A value less than three was taken as no anxiety, values between 3 to 7 as moderate anxiety, and a value more than seven as high anxiety.<sup>11</sup> Children's anxiety level was assessed at the time of induction of anaesthesia by using the modified facial affective scale (3-face), where expressions of the smiley face were used to assess the child's anxiety as no anxiety (smiling face), some anxiety (confused face) and very high anxiety (crying face).<sup>12</sup> Information regarding previous exposure to general anaesthesia, the child's social behaviour (sociable/unsociable) and whether the child was school going/ non-school going were also obtained.

Statistical Package for Social Sciences (SPSS) version 24.0 was used for the data analysis. Fisher exact test/chi-square test were applied to assess the association of a child's anxiety with personality, schooling, previous exposure to general anaesthesia and parental anxiety. The *p*-value of  $\leq 0.05$  was considered statistically significant.

**RESULTS**

Ninety-one children were included in this study. The age range of the patients was from 3 to 10 years, with the mean age of  $4.58 \pm 1.56$  years. 37 (40.7%) patients were females, while 54 (59.3%) were males. 30 (33%) patients were not school-going, while 61 (67%) patients were school-going. 37 (40.7%) patients were un-sociable, while 54 (59.3%) were sociable. 80 (89%)

patients had no previous exposure to general anaesthesia, while 10 (11%) patients had previous exposure to general anaesthesia. A comparison of the anxiety seen in children and parents was shown in the Figure.



**Figure:** Parental anxiety assessed by Visual Analogue Scale-Anxiety and Child anxiety assessed by Modified Affective scale.

Gender, school-going status and previous exposure to GA were not significant factors in predicting pre-operative anxiety in children with *p*-values of 0.399, 0.183 and 0.122, respectively. On the other hand, parental anxiety had a very strong impact on child pre-operative anxiety with *p*-value of  $< 0.001$ , suggesting that children of anxious parents had high pre-operative anxiety. Moreover, the personality of the child also had statistical significance with *p*-value  $< 0.001$  as shown in the Table.

**Table: Predictive factors for child's anxiety.**

Factors	Status	Anxious Child	Child Not Anxious	<i>p</i> -value
Gender	Female	32 (35.16%)	5 (5.49%)	0.399
	Male	43 (47.25%)	11 (12.09%)	
School Going Status	Going	48 (52.74%)	13 (14.28%)	0.183
	Not Going	27 (29.67%)	3 (3.29%)	
Anxiety of Parents	Anxious	72 (79.12%)	2 (2.19%)	$< 0.001$
	Not Anxious	3 (3.29%)	14 (15.38%)	
Child's Personality	Sociable	39 (42.85%)	15 (16.48%)	$< 0.001$
	Not sociable	36 (39.56%)	1 (1.09%)	
Previous Exposure To General Anesthesia	Yes	10 (10.99%)	00 (0%)	0.122
	No	65 (71.43%)	16 (17.58%)	
	Not sociable	36 (39.56%)	1 (1.09%)	

**DISCUSSION**

Our study showed that the child's social behaviour and parental anxiety were significant risk factors for the child's anxiety before induction of anaesthesia. However, a child's schooling, gender, and previous exposure to general anaesthesia were not related to pre-operative anxiety.

Anxiety in children and their parents is a significant factor that delays the treatment of dental caries

in children, which may have long-lasting consequences. Our study showed that unsociable behaviour of children and children of anxious parents are at the highest risk of anxiety before anaesthesia for dental procedures.

Children's social behaviour and personality traits help us identify children at higher risk of pre-operative anxiety. A study by Mamtor *et al*, has shown similar results as our study, thus concluding that less sociable children are at a higher risk of pre-operative anxiety.<sup>12</sup> A recent meta-analysis done by Chow *et al*, has explored the association of temperament with pre-operative anxiety in paediatric patients undergoing surgery. According to this systemic review, activity, emotionality, sociability, shyness, impulsivity, withdrawal and intensity of reaction were the temperament traits that significantly affected pre-operative anxiety levels, where increased emotionality, shyness, impulsivity, withdrawal and intensity of reaction and low levels of activity and sociability led to increased anxiety levels.<sup>13</sup>

Parents play a significant role when it comes to the anxiety of children. Parents often discuss their fears of dental procedures before children, which directly affects their anxiety levels.<sup>14</sup> The same has been observed in our study. Parental anxiety has also impacted on recovery of children, and children of highly anxious parents are at a greater risk of higher postoperative pain.<sup>15</sup> According to another study, family structure and the presence of siblings are significant determinants for children's dental fear and anxiety.<sup>16</sup> Giving pre-anaesthetic information may decrease parents' anxiety, but it is not effective in reducing their children's anxiety.<sup>17</sup> Level of parental anxiety is different among parents, where mothers have shown a significantly higher level of anxiety than fathers. Moreover, explaining surgery complications increased parental anxiety while giving information regarding pain management for their children decreased their anxiety.<sup>18</sup>

Our study showed that previous exposure to general anaesthesia had no significant effect on pre-operative child anxiety. However, a study conducted by Barki *et al*, concluded that stressful events, pain and parental separation recalled from previous general anaesthesia exposure are major factors for subsequent anxiety, and repeated general anaesthesia exposure may even lead to attention deficit or hyperkinetic disorder.<sup>19</sup>

Comparing the gender to assess the pre-operative anxiety has shown varying results in the literature. Such differences may be due to the cultural back-

ground of the population studied.<sup>20</sup> However, our study has not shown any significant gender difference.

A study by Cui *et al*, has looked into the impact of schooling on anxiety and showed that preschool children and their parents had higher pre-operative anxiety, and their parents had a stronger impact on their children's anxiety.<sup>21</sup> This was in contrast to our study where we found that the child's schooling is not related to pre-operative anxiety of children.

#### LIMITATION OF STUDY

There were a few limitations in our study. We have not considered parental presence at the time of induction of anaesthesia which may affect a child's anxiety level. Moreover, the personality or behaviour of the anaesthesiologist was also not taken into account, which may be another factor affecting anxiety in children and parents.

#### CONCLUSION

Non-social behaviour of the child and the anxiety level of parents are major determinants of pre-operative anxiety in children undergoing dental procedures.

**Conflict of Interest:** None.

#### Authors' Contribution

RF: Direct contribution, AH:, MT:, AWT: Intellectual contribution.

#### REFERENCES

1. Umer MF, Shabbir A, Zofeen S, Mujtaba H, Tahir M. Prevalence and associated factors of dental caries, gingivitis, and calculus deposits in school children of Sargodha district, Pakistan. *J Ayub Med Coll Abbottabad* 2016; 28(1): 152-156.
2. Dharmo B, Elezi B, Kragt L, Wolvius EB, Ongkosuwito EM. Does dental caries affect dental development in children and adolescents? *Bosn J Basic Med Sci* 2018; 18(2): 198-205.
3. Lee JR, Loepke AW. Does pediatric anesthesia cause brain damage? - Addressing parental and provider concerns in light of compelling animal studies and seemingly ambivalent human data. *Korean J Anesthesiol* 2018; 71(4): 255-273.
4. Klingberg G, Broberg AG. Dental fear/anxiety and dental behaviour management problems in children and adolescents: a review of prevalence and concomitant psychological factors. *Int J Paediatr Dent* 2007; 17(1): 391-406.
5. Armfield JM, Spencer AJ, Stewart JF. Dental fear in Australia: who's afraid of the dentist? *Aust Dent J* 2006; 51(1): 78-85.
6. Kain Z, Mayes L. Anxiety in children during the perioperative period. In: Bornstein M, Genevro J, eds. *Child development and behavioral pediatrics*. Mahwah, NJ: Lawrence Erlbaum. 2010; 20(4): 318-22.
7. Charana A, Tripsianis G, Matziou V, Vaos G, Iatrou C, Chloropoulou P. Preoperative Anxiety in Greek Children and Their Parents When Presenting for Routine Surgery. *Anesthesiol Res Pract* 2018; 2018(1): 1-6.
8. Fortier MA, Kain ZN. Treating perioperative anxiety and pain in children: a tailored and innovative approach. *Paediatr Anaesth* 2015; 25(1): 27-35.
9. Kar SK, Ganguly T, Dasgupta CS, Goswami A. Preoperative Anxiety in Pediatric Population: Anesthesiologists Nightmare. *Transl Biomed* 2015; 6(4): 1-9.

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10. Chhabra N, Chhabra A, Walia G. Prevalence of dental anxiety and fear among five to ten year old children: a behaviour based cross sectional study. *Minerva Stomatol* 2012; 61(3):83-89.
  11. Quiles JM, García GG, Chellew K, Vicens E, Marín AR, Nicolás MP. Identification of degrees of anxiety in children with three- and five-face facial scales. *Psicothema* 2013; 25(4): 446-451.
  12. Mamtora PH, Kain ZN, Stevenson RS, Golianu B, Zuk J, Gold J, et al. An evaluation of preoperative anxiety in Spanish-speaking and Latino children in the United States. *Paediatr Anaesth* 2018; 28(8): 719-725.
  13. Chow CHT, Rizwan A, Xu R, Poulin L, Bhardwaj V, Lieshout RJV. Association of temperament with preoperative anxiety in pediatric patients undergoing surgery: a systematic review and meta-analysis. *JAMA Network Open* 2019; 2(6): e195614.
  14. Gao X, Hamzah SH, Yiu CK, McGrath C, King NM. Dental fear and anxiety in children and adolescents: qualitative study using YouTube. *J Med Internet Res* 2013; 15(2): e29.
  15. Rosenberg RE, Clark RA, Chibbaro P, Hambrick HR, Bruzzese JM, Feudtner C, et al. Factors predicting parent anxiety around infant and toddler postoperative and pain. *Hosp Pediatr* 2017; 7(6): 313-319.
  16. Themessl-Huber M, Freeman R, Humphris G, MacGillivray S, Trezi N. Empirical evidence of the relationship between parental and child dental fear: a structured review and meta-analysis. *Int J Paediatr Dent* 2010; 20(1): 83-101.
  17. Cumino D, Cagno G, Gonçalves VF, Wajman DS, Mathias LA. Impact of preanesthetic information on anxiety of parents and children. *Braz J Anesthesiol* 2013; 63(6): 473-482.
  18. Pomicino L, Maccacari E, Buchini S. Levels of anxiety in parents in the 24 hr before and after their child's surgery: A descriptive study. *J Clin Nurs* 2018; 27(1-2): 278-287.
  19. Bakri MH, Ismail EA, Ali MS, Elsedfy GO, Sayed TA, Ibrahim A. Behavioral and emotional effects of repeated general anaesthesia in young children. *Saudi J Anaesth* 2015; 9(2): 161-166.
  20. El-Housseiny AA, Merdad LA, Alamoudi NM, Farsi NM. Effect of child and parent characteristics on child dental fear ratings: analysis of short and full versions of children's fear survey schedule-dental subscale. *Oral Health Dent Manag* 2015; 14(1): 9-16.
  21. Cui X, Zhu B, Zhao J, Huang Y, Luo A, Wei J. Parental state anxiety correlates with preoperative anxiety in Chinese preschool children. *J Paediatr Child Health* 2016; 52(6): 649-655.
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