

Pre operative anxiety and its contributing factors in pediatric patients' parents undergoing surgery

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Abstract

Introduction: Hospitalization and surgery are among the most difficult experiences which children and their parents have to face. Many parents experience preoperative anxiety during the hospitalization of their children.

This study attempts to assess preoperative anxiety in parents of children admitted for elective surgery and to evaluate factors associated with increased anxiety.

Material and Methods: In a cross-sectional study, all parents consecutively admitted to the study hospitals (Shahid Beheshti hospital in kashan and Imam Hossein hospital in Esfahan) were assessed. We used standard anxiety assessment questionnaires [Amsterdam Preoperative Anxiety and Information Scale (APAIS) and Spielberger's State-Trait Anxiety Inventory (STAI)] to quantify the anxiety of parents just before their child entered the operative theater. For mean comparison between variables, independent t-test, ANOVA and Chi-square analysis were used. Multiple regressions were conducted to determine the factors attributed to pre operative anxiety. A P-value of less than 0.05 was considered significant.

Results: In this study 100 parents (60 cases from Shahid Beheshti hospital and 40 patients from Imam Hossein hospital) were evaluated. The mean anxiety score was 51.05 ± 1.19 for STAI, 15.27 ± 2.83 for APAIS (anxiety), and 8.07 ± 1.7 for APAIS (information) respectively. Parents education was a factor that significantly affected the STAI ($p=0.042$), but its effect on APAIS was not significant. In regression analysis for anxiety severity, child age was a significant factor of anxiety status ($p=0.043$).

Conclusions: This study showed that anxiety is relatively high in our centers and parent's education and children age are the most important predictive factors for this condition.

Keywords

- Spielberger's State-Trait Anxiety Inventory test
- Amsterdam Preoperative Anxiety and Information Scale
- Pre operative Anxiety

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Introduction

Preoperative anxiety can be described as an unpleasant state of tension or uneasiness that results from a person's uncertainties or worries before an operation. It is a universal reaction experienced by patients who are admitted to the hospital for surgery.^{1,2} Through the research done by several individuals, it is concluded that there are many different fears such as "the unknown", surgical failure, anesthesia³, loss of personal identity, recuperation around strangers⁴, pain⁵, loss of control, death⁶, unsuccessful recovery⁷ and strange environment⁸ that can cause preoperative anxiety.

It also has been shown that pre operative anxiety adversely influences the surgical procedure as well as affect the recovery process.⁶ Anxiety activates the physiologic systemic response to injury in the patient's body, which can hamper healing mechanisms.⁷ It also increases the need for anesthesia, which increases anesthetic risk.⁸ Furthermore, anxiety may increase the pain medication needed postoperatively, which can have a bad effect on postoperative recovery, for example, by suppressing the respiratory system, which increases pulmonary complications; decreasing activity, which increases risk of thrombosis; and increasing risk of bowel upset.⁹ Also anxiety may cause an increase in the infection risk and decrease the immune system response.¹⁰

In pediatric surgery operations, both children and their accompanying parents experience pre operative fear and anxiety.¹¹⁻¹³ The anxiety state of the accompanying parent (apprehension, nervousness and worry) can increase the child's anxiety while entering the operating room and during the induction of anesthesia.¹⁴

Several studies have been carried out focusing on children and families in the perioperative setting. Kain et al. evaluated family oriented education for surgery and how it could affect the outcomes.¹⁵ He showed that parents who received standard care along with a behavioral program, had less anxiety. Another study showed that an educational program for pediatric patients concerning anesthesia induction in the preoperative setting was effective in decreasing preoperative anxiety in children and their parents.¹⁶ There are few studies on child anxiety in Iran¹⁷⁻¹⁸, but we have not found any Iranian studies of preoperative anxiety in parents of children. Most of Iranian studies are based on preoperative interventions for adult patients.

This study aimed to quantify preoperative anxiety in the parents of Iranian children admitted to our hospital for elective surgery and to discover factors that increased their anxiety.

Patients and Methods

This cross-sectional study took place in the pediatric surgery operating rooms of two major general hospitals in Iran (Shahid Beheshti hospital in kashan and Imam Hossein hospital in Isfahan) from January 2012 to

June 2013. The sample size was determined using an equation for cross-sectional studies ($n = z^2pq/E^2$). The portion of parents who had preoperative anxiety based on our pilot study on 25 parents was 93%, 95% confidence level and a 5% margin of error. Subsequently 100 subjects were enrolled into the study. Participants were all parents consecutively admitted to the pediatric surgery unit for operation of their children. Our study cases were selected using convenience sampling. The parents were informed about the hospital admission process. The inclusion criteria was: elective operation, and being available at the time of data collection. Parents with known psychological disorders (based on past history taken by physicians) were excluded. The age of the child was not considered as a limiting factor in our study, because the target population of this survey were the parents and parents of all children aged less than 16 years could be included in the study. Our study was approved by the Hospital's ethics committee. All parents gave their written consent after the study was explained to them. Personal bias was avoided by having independent research assistants trained in filling out responses of questionnaire for illiterate parents. They also helped the literate parents for better understanding of the questionnaire.

Assessment procedure

We employed the Spielberger's State-Trait Anxiety Inventory (STAI) for assessing the anxiety and Amsterdam Preoperative Anxiety and Information Scale (APAIS) to quantify accompanying parent anxiety in the waiting area just before entering the operative theater. Waiting area in operating rooms are specialized rooms in operating halls for holding and premedication of children before entrance to operating rooms. For cultural purposes, in most holding rooms, mothers were permitted to be with their children, but for older children, sometimes the fathers could be with their children in these rooms. Assessment and completion of answer sheets were performed after conveying the patients and their parents to a child-friendly holding area for 20 minutes and just before entering the operating theater.

Measures APAIS

APAIS (appendix 1) is a six-item self-report measure of preoperative anxiety and need for information regarding anesthesia and operation.¹⁹ The content validity and reliability of this scale were established in several studies (Cronbach's α 0.72 to 0.86). In this study, we used the Farsi version of APAIS questionnaire translated by Nikandish et al.¹⁹ They showed that the Farsi version of APAIS is a valid and reliable instrument for evaluation of preoperative anxiety and information requirement (Cronbach's alpha was 0.84 for the anxiety scale and 0.82 for the need-for-information scale). Parents were asked to specify their level of agreement with each item on a five-point Likert scale from 1 = "not at all" to 5 = "extremely". Two items represented fear of anesthesia (I am worried about the anesthetic; the anesthetic is on my mind continually). Two items represented fear of the

surgical procedure (I am worried about the procedure, the procedure is on my mind continually) (questions 1, 2, 4 and 5 with scoring range of 4 to 20) and two items represented the need for information about anesthetic and the surgical procedure respectively (questions 3 and 6 with scoring range of 2 to 10). A cut off value of ≥ 11 of APAIS score was used to dichotomize levels of parental anxiety (low versus high anxiety). The main benefit of the APAIS is its conciseness and its capability to be used in a wide range of clinical settings. It has been used in several countries and has proven an effective and useful tool when compared to other anxiety measures. The major drawback was that the tool did not distinguish well between fear of anaesthesia and fear of surgery. On the information scale, scores of 2-4 are translated as having little or no information requirements, scores of 5-7 are translated as having an average information requirement and scores of 8-10 are translated as having high information requirements.

STAI

STAI is a psychological test consisting of 40 self-reporting questions based on a 4-point Likert scale. In this study we used translated STAI questionnaire for S-anxiety which consists of 20-items on which responders are asked to evaluate themselves on a 4-point scale (1. not at all, 2. somewhat, 3. moderately so, 4. very much so) (total score range: 20-80). State anxiety refers more to how a person is feeling at the time of a perceived threat and is considered temporary.

A cut of value of ≥ 46 on the state subscale was used to dichotomize between anxious and no or slightly anxious parents. STAI is considered as the gold standard scale for anxiety measurement.¹⁹

Statistical Analysis

In this study all qualitative and quantitative variables were reported as percent and mean \pm SD respectively. Data were tested for skewness which had a skewness of -0.1 (normally distributed). For comparison between variables, independent t-test, ANOVA and Chi-square tests were used. Multiple regressions were conducted to determine the factors attributed to pre-operative anxiety. A P-value of less than 0.05 was considered as significant. Statistical analysis was performed using SPSS 16.

Results

In this study 100 parents (60 cases from Shahid Beheshti hospital and 40 patients from Imam Hossein hospital) were evaluated. Demographic characteristics of children and their parents are shown in [Table 1](#).

Table 1: Demographics of patients and parents

Gender of parents	
Male	10
Female	90
Gender of child	
Male	34
Female	66
Child's age (month)	47.31(5.06)
Parent's age (Years)	39.2(4.65)
Number of Children	
Parent Educational level	
Illiterate	44(44%)
Primary school	34(34%)
High school	2(2%)
University	20(20%)
Past surgery of child (yes/no)	
yes	64
No	36

As shown in this table, most questionnaires were completed by mothers (90%), and many of them were illiterate (44%). Table 2 shows the type of surgeries in patients. As shown in this table, inguinal herniorrhaphy and orchiopey for undescended testes were the most common operations of children (45% of patients).

The mean anxiety score was 51.05 ± 1.19 (Range: 22-77) for STAI, 15.27 ± 2.83 (Range: 5-18) for APAIS (anxiety), and 8.07 ± 1.7 (Range 3-10) for APAIS (information) respectively.

Table 2: Type of operations

Intervention	male (%)	female (%)	total (%)
Inguinal hernia	25 (25)	5(5)	30(30)
Tumors	5 (5)	3(3)	8 (8)
Colostomy	2 (2)	2 (2)	4(4)
Syndactyly	0(0)	1(1)	1(1)
Undescendent testes	15(15)	0(0)	15(15)
Cleft lip	10 (10)	4 (4)	14(14)
Hypospadiasis	10 (10)	0 (0)	10(10)
Ventilation tub	1(1)	3(3)	4(4)
Endoscopy	6(6)	4 (4)	10(10)
Perm o cath	1(1)	0(0)	1(1)
Meningocelle	1(1)	0(0)	1(1)
A d e n o - t o n s i l e c t o m y	0(0)	2 (2)	2(2)

In **Table 3** the relationship between the STAI score and qualitative variables of the parents were shown.

For better analysis, we chose orchiopey and inguinal herniorrhaphy as common procedures and other operations as uncommon procedures.

Table3: The relationship between the STAI score and qualitative variables of the parents

variable	STAI Mean (\pm SD)	P
Gender of parents		0.53
Male	48.2(15.8)	
Female	51.4(11.42)	
Gender of child		0.73
Male	50.61(12.7)	
Female	51.8(10.)	
Parent education		0.042
Illiterate	49.1(10.9)	
Primary school	44.1(15.98)	
High school	54.7(9.2)	
University	61.5(9.1)	
Previous surgery of child		0.39
Yes	52.94 (11.48)	
No	49.9(12.31)	
Type of surgery		0.77
Common	56.12(13.5)	
Uncommon	59.38(12.8)	

According to these results, education (as independent variable) had a significant effect on STAI (as dependent variable) ($p=0.042$), but its effect on APAIS was not significant (Table 4).

Table 4 : The relationship between the APAIS score and qualitative variables of the parents

Variable	APAIS(Anxiety)	P	APAIS (Information)	P
Gender of parents		0.9		0.73
Male	11.28(2.4)		8.28(1.49)	
Female	11.4(2.8)		8.04(1.77)	
Gender of child		0.8		0.94
Male	11.45(2.6)		8.09(1.6)	
Female	11.27(3.02)		8.05(1.98)	
Parent education		0.24		0.84
Illiterate	10.7(2.4)		7.9(1.6)	
Primary school	11.41(2.8)		8.1(1.96)	
High school	14(0.2)		9(1.4)	
University	12.3(3.1)		8.2(1.75)	
Previous surgery of child		0.38		0.21
Yes	10.9(2.5)		8.47(1.3)	
No	11.6(2.8)		7.84(1.9)	
Type of surgery		0.46		0.61
Common	10.35(3.5)		7.8(2.2)	
Uncommon	11.2(3.5)		7.65(3.1)	

For more analysis, variables were compared between parents with high anxiety ($STAI \geq 46$ or $APAIS \geq 11$) and those with low to moderate anxiety. Again, education was a significant factor for both measures (Table 5).

Table 5 : The status of anxiety of parents according to their characteristics

In regression analysis for status of anxiety (High versus low) as an independent variable, child age was a significant predictor of anxiety severity (Table 6) ($p=0.043$). Parents' age and number of children were not significant in this study.

variable	Status of anxiety		Chi-square	P value
	High, No.(%)	low, No.(%)		
Gender of parents				
Male	2(2)	8(8)	2.23	0.16
Female	17(17)	73(73)		
Gender of child				
Male	10(10)	24(54)	0.63	0.34
Female	12(12)	54(54)		
Parent education				
Illiterate	14(14)	30(30)	11.9	0.008
Primary school	2(2)	32(32)		
High school	2(2)	0(0)		
University	8(8)	12(12)		
Previous surgery of child				
Yes	16(16)	48(48)	0.59	0.43
No	4(4)	32(32)		
Type of surgery				
Common	25(25)	20(20)	10.01	0.61
Uncommon	36(36)	19(19)		

Table 6: Model summary of regression analysis of child age as a significant factor in parents' anxiety

Variable	R square	F	Df1	Sig
Age	0.079	4.29	1	0.043

Discussion

According to the results of our study, parents had a high anxiety level in the preoperative phase of an elective operation. Having a child who needs operation brings psychological changes to the parents.¹⁸⁻¹⁹ Kaine et al. have shown that the level of anxiety of children whose parents use avoidant coping mechanisms are higher.²⁰ Ahmed et al. in their research about the risk factors of preoperative anxiety in children and their parents found that parents accompanying children have physiological responses (Heart rate variability, increasing of salivary amylase levels) that correlate with their children's preoperative behavior.²¹ In that study, predictors of increased parental anxiety were gender of the parent (mothers are more anxious), parents of infants and parents of children who have been through repeated hospitalizations. In our study we have not found any significant correlation between previous surgery and anxiety level of parents. We also found no significant correlation between parent gender and anxiety, it should be noted that in our study the number of fathers were so limited that statistical comparison is not possible. As mentioned, for Islamic and cultural purposes, in most holding rooms, mothers were permitted to be with their children, but for older children, fathers could also be with their children in these rooms.

Consistent with findings of Bevan et al., our study indicates that the presence parents in operating theaters is not always beneficial.²² In our hospitals, parents are always present in the pre medication phase of anesthesia and children are pre-medicated in their mothers arms but our results showed that the anxiety level is steal moderate to high; thus it seems that the presence of parents in operating rooms is insufficient in our cases to decrease the anxiety level. Considering the real-life-threatening nature of entering the operating theaters, it is psychologically natural and logical for the parental levels of stress to rise.¹⁰ Based on some studies, use of educational pamphlets, audio-visual aids, or presence of clowns in surgical wards for education can be method for decreasing anxiety.^{10,15}

Other finding of this study show that parent education level and child age is significant variables for pre operative anxiety. With increasing the education level or child age, pre operative anxiety increased. These finding are in contrast to Thompson et al. findings that failed to show identified factor for prediction of anxiety in parents.²³ Ebrim et al. also showed that anxiety

level was not significantly different between primary, secondary and tertiary levels of education.²⁴ It seems that by increasing the education level of our parents; their knowledge for complications of surgery and anesthesia will increase (by books, medical journals, and internet) which reflects by an increase in anxiety in the pre-operative period.

There was also a significant relationship found between parent's anxiety level and the age of the child. In fact; it was found that anxiety level of parent's with infants was worst. It seems that parents who have infants cannot tolerate the operation stress as much as parents of older children. This finding is similar to the findings of a study by Ahmed et al. In this study, there were no significant difference between the number of children and parent's anxiety level; but Kaine found that there is a significant relationship between these two variable.²⁵

In this study, the child's sex did not have an association with anxiety level of parents. This finding may be explained by the fact that parents are more concerned about the operation and safety of their children and it does not matter if that child is a girl or a boy.

We did not measure the anxiety level of children there for the correlation of child anxiety with their parents anxiety cannot be assessed which is one of the limitations of our study.

The relationship between the parent's anxiety level and their age in this study was not statistically significant. Tsai et al. focused on using the Roy model in patients and showed that age affects daily stress.²⁶ In our study, most parents were middle aged, therefore the age variation in the current study was limited which could explain the results.

Based on our findings, it seems that, we should design new methods such as video tape, music therapy, relaxation techniques or interview with expert perioperative nurses for reducing parent's anxiety.

In conclusion, our study showed that anxiety is moderate to high in our hospitals and parent's education and children age are the most important predictive factors for this sensation.

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References

1. Litke J, Pikulska A, Wegner T: Management of perioperative stress in children and parents. Part I the preoperative period. *Anaesthesiol Intensive Ther* 2012; 44(3):165-9.
2. Pritchard MJ: Identifying and assessing anxiety in pre-operative patients. *Nursing Standard* 2009; 23(51): 35-40.
3. Thuczek A, Henriques JB, Brown RL: Support for the Reliability and Validity of a Six-Item State Anxiety Scale Derived From the State-Trait Anxiety Inventory. *J Nurs Meas* 2009; 17(1): 19-28.
4. Eloise CI: Patterns and frequency of anxiety in women undergoing gynaecological surgery. *J Clin Nurs* 2006; 15(3): 341-352.
5. Karanci AN, Dirik G: Predictors of Pre-and Postoperational Anxiety in Emergency Surgery Patients. *J Psychosom Res* 2003; 55(4):36-3-9.
6. Berghmans J, Weber F, van Akoleyen C, et al: Audiovisual aid viewing immediately before pediatric induction moderates the accompanying parents' anxiety. *Paediatr Anaesth* 2012; 22(4):386-92.
7. Grieve RJ: Day surgery preoperative anxiety reduction and coping strategies. *Br J Nurse* 2002; 11(10):670-678.
8. Stirling L, Raab G, Alder EM, et al: Randomized trial of essential oils to reduce perioperative patient anxiety: feasibility study. *J Adv Nurs* 2007; 60(5): 494-501.
9. Spaulding NJ: Reducing anxiety by pre-operative education: make the future familiar. *Occup Ther Int* 2003; 10(4):278-293.
10. Starkweather AR, Witek-Janusek L, Nockels RP, et al: Immune function, pain and psychological stress in patients undergoing spinal surgery. *Spine* 2006; 31(18): 641-647.
11. Watson AI, Visram A: Children's preoperative anxiety and postoperative behavior. *Paediatr Anaesth* 2003; 13(3):188-204.
12. Kain ZN, Caldwell-Andrews AA, Mayes LC, et al: Parental presence during induction of anesthesia: physiological effects on parents. *Anesthesiology* 2003; 98(1):58-64.
13. Caldwell-Andrews AA, Kain ZN, Mayes LC, et al: Motivation and maternal presence during induction of anesthesia. *Anesthesiology* 2005; 103(3):478-83.
14. Kain ZN, Caldwell-Andrews AA, Maranets I, et al: Predicting which child-parent pair will benefit from parental presence during induction of anesthesia: a decision-making approach. *Anesth Analg* 2006; 102(1):81-4.
15. Kain ZN, Caldwell-Andrews AA, Mayes LC, et al: Family-centered preparation for surgery improves perioperative outcomes in children: a randomized controlled study. *Anesthesiology* 2007;106(1):65-74.
16. MacLaren JE, Kain ZN: Development of a brief behavioral intervention for children's anxiety at anesthesia induction. *Child Health Care* 2008;37(3):196-209.
17. Perpiñá-Galvañ J, Cabañero-Martínez MJ, Richart-Martínez M: Reliability and validity of shortened state trait anxiety inventory in Spanish patients receiving mechanical ventilation. *Am J Crit Care* 2013; 22(1):46-52.
18. Hosseinpour M, Memarzadeh M: Use of a preoperative playroom to prepare children for surgery. *Eur J Pediatr Surg* 2010; 20(6):408-11.
19. Nikandish R, Anvar M, Avand A, et al: Translation and validation of the amsterdam preoperative anxiety and information scale (APAIS) for Iranian population. *Pajouhesh Dar Pezeshki* 2007; 31(1):79-84.
20. Kain Zn, Maclaren J, Mayes Lc: Perioperative behavior stress in children. In: Cote CJ, Lerman J, and ID Todres, Eds. *A Practice of Anesthesia for Infants and Children*. Philadelphia, PA: Saunders Elsevier; 2009, 27.
21. Ahmed M, Farrell MA, Parrish K, et al: Preoperative anxiety in children risk factors and non-pharmacological management. *M.E.J. ANESTH* 2011;21 (2) :153-170.
22. Bevan JC, Johnston C, Haig MJ, et al: Preoperative parental anxiety predicts behavioral and emotional responses to induction of anaesthesia in children. *Can J Anaesth* 1990; 37(2):177-82.
23. Thompson N, Irwin MG, Gunawardene WM, et al: Pre-operative parental anxiety. *Anaesthesia* 1996; 51(11):1008-12.
24. Ebirim L, Tobin M: Factors Responsible For Pre-Operative Anxiety In Elective Surgical Patients At A University Teaching Hospital: A Pilot Study. *Intern J Anesthesiol* 2011; 29(2): 5580-1584.
25. Kain ZN, Mayes LC, O'Connor TZ, Cicchetti DV: Preoperative anxiety in children. Predictors and outcomes. *Arch Pediatr Adolesc Med*1996; 150(12):1238-45.
26. Tsai p, Tak S, moore C, et al: Testing a theory of chronic pain. *J Adv Nurs* 2003;43(2) :158-169.

Appendix 1: Amsterdam Preoperative Anxiety and Information Scale (APAIS)

1. I am worried about the anesthetic.
2. The anesthetic is on my mind continually.
3. I would like to know as much as possible about the anesthetic.
4. I am worried about the procedure.
5. The procedure is on my mind continually.
6. I would like to know as much as possible about the procedure.

The measure of agreement with these statements should be graded on a five-point Likert scale from 1 = not at all to 5 = extrem