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## Investigating the Relationship between Anxiety of School-age Children Undergoing Surgery and Parental State-trait Anxiety

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### Abstract

**Background:** Surgery is a stressful experience for children, and preoperative anxiety in children could be affected by the level of parental anxiety.

**Aim:** The aim of this study was to determine the relationship between anxiety in school-age children before surgery and parental state-trait anxiety.

**Method:** This descriptive study was performed on 81 children within the age group of 6-12 years admitted for elective surgical operation and 128 parents in Doctor Sheikh Hospital, Mashhad, Iran, 2016. Children's anxiety and parental anxiety were measured before the entrance of the patients to the operating room via Revised Children's Manifest Anxiety Scale (RCMAS) and Spielberger's State-Trait Anxiety Inventory, respectively. The data was analyzed in SPSS, version 16, using the relevant statistical tests.

**Results:** The results of Pearson product-moment correlation test showed a positive correlation between children's anxiety and fathers' state anxiety and between children's anxiety and mothers' state anxiety ( $r=0.27$ ,  $r=0.41$ ;  $P=0.005$ ,  $P=0.040$ , respectively). However, no statistically significant relationship was observed between children's anxiety and parents' trait anxiety, age of children, as well as parents' educational level, occupation, and level of trait anxiety.

**Implications for Practice:** Considering the association between parents' state anxiety and children's anxiety, implementing preoperative interventions to prepare parents for surgery is recommended.

**Keywords:** Anxiety, Children's anxiety, Children undergoing surgery, Parental anxiety

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## Introduction

Hospitalization is a socialization crisis for children and adaptation to the new environment should be facilitated in this conditions wherein children not only lack well-being, but also they are exposed to unknown risk factors (1). Surgery, programmed or not, small or large, invasive or noninvasive, is a stressful experience for children (2). It is noteworthy that any kind of surgery is considered as a stressful experience because it is a threat to the integrity of the body and sometimes to life (3). Children have less adaptive behaviors to cope with such situations. Due to the limited experience of children in dealing with these procedures, these situations can be very painful and stressful for them (4).

Anxiety is one of the most highly prevalent preoperative problems (5). Factors such as mother's situational anxiety, child's mood, age, and quality of previous medical treatments, operating room atmosphere, separation from parents, and unfamiliar environment of the operating room can be sources of preoperative anxiety in children.

Yoneyama stated that 61% of patients and 75% of families whose children need surgery are anxious about anesthesia and surgery (6). Preoperative anxiety not only causes a great deal of pain for children during the surgery experience, but it also has a negative impact on postoperative recovery, and possibly, the postoperative period (7). Behaviors caused by anxiety manifest in the form of negative behaviors during the surgery experience (including restlessness, crying, spontaneous urination, and need for physical restrictors) (8). Anxiety is also associated with postoperative maladaptive behaviors such as increased distress in recovery stage, recurrent postoperative behavioral disorders (such as nightmares), separation anxiety, dietary disorders, sleep disturbance, and enuresis (8, 9).

In fact, the benefits of reduced anxiety encompass better and faster recovery, reduced use of drugs during anesthesia, better toleration of pain, and early discharge from hospital, which in turn, lead to lower costs and postoperative complications (10). Anxiety before surgery and anesthesia is not limited to children, but it also affects parents. In fact, anxiety is the most common feeling pertaining to the stress experienced by the children and parents who are waiting for their child's surgery (11).

Various studies were performed using care interventions to lower anxiety in children. In the majority of these studies, techniques such as therapeutic touch (12), play program (1), preoperative sedation (13), and preoperative education (14) were used to assuage anxiety in children. A limited number of studies were carried out in partnership with parents to reduce children's anxiety. Studies showed that the following factors constitute the sources of parental anxiety: 1) fear of the hospital environment, 2) fear of separation from child and the fear that nurses attract the attention of children by the care they give to them, 3) fear of the unknown and the fear of the events that may happen in the near or distant future, 4) fear that the hospital staff will cause the suffering of their children, 5) fear of the possibility of the disease contagiousness and its contagion to other family members, 6) fear of the financial burden caused by the disease, and 7) fear of the disease reflection in the community as a sign of parental behavior (15).

Therefore, besides attention to children, parents' concerns should be taken into consideration (16). However, studies have shown that the presence of an overly anxious parent during the induction of anesthesia is not in favor of an anxious child and may increase anxiety in a calm and relaxed child (17). To date, a limited number of interventions were performed to reduce parental anxiety, and there is scarcity of studies on the relationship between parental anxiety and anxiety in the children undergoing outpatient surgery. In the present study, we investigated the relationship between preoperative anxiety in school-age children who were undergoing outpatient surgeries and parental state-trait anxiety in Doctor Sheikh Hospital, Mashhad, Iran, 2016.

## Methods

This descriptive study was conducted in 2016. Children' anxiety and parents' preoperative state and trait anxiety were the factors under study. The study population consisted of all the school-age children undergoing non-emergency elective surgical operations such as hernia, circumcision, cyst resection, cystoscopy, endoscopy, colonoscopy, and dental operation and their parents. Based on the study by Cui et al. (2016), the sample size of this study was estimated at 79 participants, where the correlation coefficient in both groups equaled 0.31 and the statistical power and confidence level were 80% and 95%, respectively (18). In this study, we enrolled 81 children undergoing outpatient surgery and their parents.

The inclusion criteria were 1) children aged 6-12 years; 2) outpatient operation requiring a hospital stay of less than six hours (hernia, genital mutilation, cyst resection, cystoscopy, endoscopy, colonoscopy, and dental operation); 3) children with normal verbal, visual, and auditory perception; 4) children not suffering from known psychological illness; 5) children living with both of their parents; 5) no history of previous surgery; and 6) elective surgical operation.

The exclusion criteria included cancelation of surgery and unwillingness of children or their parents to continue participation at each stage of the study. Sampling was performed from June 2016 to September 2016. The participants who met the inclusion criteria were enrolled in the study after obtaining informed consent from their parents.

The form pertaining to the demographic and medical information of the participants and the Revised Children's Manifest Anxiety Scale (RCMAS) constituted the instruments used in this study. The medical personal information form consisted of six completion questions and multiple choice items with regard to age, gender, type of surgery, shift time of surgery, waiting time from reception into the ward to call in the operating room, and waiting time from admission into the operating room to entrance into the operating room.

RCMAS was designed by Reynolds and Richmond in 1978. It consists of 37 items, out of which 28 items (including the items numbered 1, 2, 3, 5, 6, 7, 9, 10, 11, 13, 14, 15, 17, 18, 19, 21, 22, 23, 25, 26, 27, 29, 30, 31, 33, 34, 35, and 37) measure anxiety and the remaining nine items (the items 4, 8, 12, 16, 20, 24, 28, 32, and 36) constitute the Lie Scale. RCMAS is a self-report scale with yes or no options (no equals the score zero and yes receives one score). The sum of "yes" responses to the items makes up the total score. The score for the anxiety items ranges from zero to 28 and it ranges from zero to nine for the lie scale. Lower score on the anxiety scale represents lower levels of anxiety and lower score on the lie scale indicates the higher sincerity and honesty of participants in responding to the questions (8). Although the validity of RCMAS was examined and approved in Iran (1998) (2), the content validity of this instrument and Children's Medical personal information form was reviewed and approved by seven faculty members of Faculty of Nursing and Midwifery in Mashhad University of Medical Sciences. The reliability of RCMAS was confirmed in the Reynolds and Richmond's study (1979) and in Iran by Rafie et al. (2011) (2). In the present study, the reliability of this instrument was assessed using Cronbach's alpha with the purpose of the confirming the internal consistency of the statements of the instrument and the obtained Cronbach's alpha coefficient was 0.82.

Parental anxiety score was assessed using Spielberger's test. This questionnaire, named State-Trait Anxiety Index (STAI), contains separate scales to measure state and trait anxiety. The state anxiety scale consists of 20 items assessing one's feelings "right now, at this moment", whereas trait anxiety implies the individual differences in response to stressful situations with different levels of state anxiety. The items of this questionnaire are rated using a 4-point Likert-type scale. A score of four indicates the presence of high anxiety. Therefore, the total scores of each of the state and trait anxiety scales can range between 20 and 80, with scores 20-31 reflecting mild anxiety, 32-42 mild to moderate anxiety, 43-53 moderate to high anxiety, 54-64 relatively severe anxiety, 65-75 severe anxiety, and above 76 highly severe anxiety (1). This instrument is frequently used in Iranian studies. The validity of STAI was confirmed by Mahram in Iran in 1993 (19). Dizaniha et al. confirmed the validity of this scale in 2013 (20). Furthermore, this questionnaire was submitted to seven professors of the Faculty of Nursing and Midwifery of Mashhad and they confirmed its validity. The reliability of this inventory was established in Iran by Rafie et al. (2011) and Taghavi et al. (2003) (2). In the present study, the reliability of this instrument was assessed by Cronbach's alpha ( $\alpha=0.76$ ).

The children who were able to read self-assessed their anxiety level and the researcher assessed the level of anxiety by asking questions from the children who were not able to read. Parents themselves completed the questionnaire while the presence of both parents was not required. However, each parent completed his/her questionnaire in case of the presence of both parents. The questionnaires were completed before the entrance of the patients to the operating room.

The most important ethical considerations of this study included obtaining approval of the Ethics Committee of Mashhad University of Medical Sciences and written informed consent from the children's parents. After data collection and coding, the data were inserted into a computer. Following ensuring the accuracy of data entry into the computer, the data were analyzed by performing Kolmogorov-Smirnov test, Chi-square, Fisher's exact test, Pearson's product-moment,

and Spearman correlation coefficient test using SPSS, version 16. P-value less than 0.05 was considered significant.

## Results

From among the total of 81 included children, 80.2% (n=65) were male. Mean age of the children was  $8.3 \pm 2.2$  years (age range: 6-12 years). The mean score of children's manifest anxiety was  $16.8 \pm 6.3$ . In addition, the mean level of mothers' state anxiety was  $46.3 \pm 5.7$  and their mean level of trait anxiety was  $46.4 \pm 5.9$ . On the other hand, the mean score of fathers' state anxiety was  $48.0 \pm 5.7$  and mean level of fathers' trait anxiety was  $47.8 \pm 7.6$ .

A positive correlation was found between the children's anxiety level and the state anxiety level fathers ( $r=0.27$ ); in other words, the higher the fathers' state anxiety, the higher the children's anxiety. In this regard, the results of Pearson's product-moment correlation coefficient reflected a statistically significant correlation ( $P=0.04$ ). In addition, a strong positive correlation was found between children's anxiety and mothers' state anxiety ( $r=0.41$ ); in other words, as the mothers' state anxiety increased, the children's anxiety exacerbated. The results of Pearson's product-moment correlation coefficient indicated that this correlation was statistically significant ( $P=0.005$ ). There was no statistically significant correlation between children's anxiety and mothers' trait anxiety ( $P=0.21$ ;  $r=0.16$ ) and children's anxiety and fathers' trait anxiety ( $P=0.28$ ;  $r=0.19$ ).

Similarly, the results of Pearson correlation test did not show any statistically significant correlation between children's age and children's manifest anxiety ( $P=0.45$ ;  $r=0.05$ ). The results also indicated that there is no statistically significant correlation between fathers' educational

**Table 1. Demographic information pertaining to the children and parents under study**

	Variable	No. (percentage)
Children's gender	Male	65 (80.2%)
	Female	16 (19.7%)
Mean age of children (years)		$8.3 \pm 2.2$
Type of surgery	Hernia	32 (39.5%)
	Circumcision	21 (25.9)
	Reform of the urinary tract	13 (16%)
	Added finger	3 (8.7%)
	Removing the tumor	7 (6.6%)
	Cystoscopy	3 (8.7%)
	Other	2 (2.4%)
	Total	81 (100%)
Surgery shift	Morning	60 (74%)
	Evening	21 (26%)
Mean age of mothers		$30.9 \pm 1.8$ (years)
Mothers' educational level	Below diploma	48 (59.2%)
	Diploma	28 (34.5%)
	Associate's degree	3 (3.7%)
	Bachelor's degree	2 (2.4%)
Mothers' occupation	Housekeeper	70 (87.5%)
	Employee	4 (9.4%)
	Other	7 (64.8%)
Mean age of fathers		$35.2 \pm 1.6$ (years)
Fathers' educational level	Below diploma	30 (64.1%)
	Diploma	13 (28.3%)
	Associate's degree	3 (4.9%)
	Bachelor's degree	2 (3.7%)
Fathers' occupation	Freelance	31 (64.1%)
	Employee	3 (6.1%)
	Worker	6 (11.1%)
	Other	8 (18.5%)

level and children's manifest anxiety ( $P=0.36$ ;  $r=0.08$ ). Furthermore, no statistically significant correlation was found between mothers' educational level and children's manifest anxiety ( $P=0.94$ ;  $r=0.008$ ).

### Discussion

This study aimed to determine the relationship between anxiety of school-age children undergoing surgery and parental state-trait anxiety. The results showed that children's anxiety is positively correlated with fathers' and mothers' state anxiety ( $r=0.27$ ,  $r=0.41$ , respectively). In other words, as parental state anxiety increased, the anxiety level of children also increased. The results of Pearson correlation coefficient test suggested that this correlation was statistically significant. However, no statistically significant relationship was noted between parents' trait anxiety and children's anxiety, children's anxiety and their age, parents' educational level and their state anxiety, and parents' occupation and their state anxiety.

The results of the present study are consistent with those of the study conducted by Fukuchi et al. (2005) who performed a study entitled as "Pre and postoperative psychological profile of children submitted to adenoidectomy and/or tonsillectomy" on 78 children with 2 to 12 years of age. In that study, 41% of the participants were preschool children and 59% were school-age students. The results of their study indicated that the majority of children and parents were suffering from mood and affect disorders. Regardless of the predominant feeling or the affective mood of children and parents, proper preoperative caveats and guidelines are required (21). In that study, the mean scores of children's manifest anxiety, mothers' state anxiety, mothers' trait anxiety, fathers' state anxiety, and fathers' trait anxiety were reported to be 16.87, 46.32, 46.42, 48.05, and 47.85, respectively.

In a study by Cui et al. (2016), which investigated the relationship between parents' state anxiety and preschool children's preoperative anxiety in a Chinese context, it was concluded that anxiety largely depends on the child's age, and anxiety in preschool children was significantly higher than in school-age children. They found a relationship between parental anxiety and preoperative anxiety only in preschool children (2-5 years), while such a relationship was not observed between parents' state anxiety and anxiety in school-age children (6-12 years). In the study by Cui et al., 54 preschool children and 48 school-age children were included. It is noteworthy that all these participants underwent plastic, ear, nose, throat, or eye surgery. Children's preoperative anxiety was evaluated via the modified YALE Preoperative Anxiety Scale immediately before surgery. State and trait anxiety of parents was assessed using the State-Trait Anxiety Inventory (STAI) (18). The results of that study are not consistent with ours. In the present study, no relationship was found between school-age children's anxiety and parents' state anxiety. This inconsistency in results can be due to the use of different tools to assess anxiety in children, as well as different cultural backgrounds of the participants of the two studies.

Ahmed et al. (2011) conducted a review study entitled as "Preoperative anxiety in children risk factors and non-pharmacological management". In that study, they aimed to evaluate the variables influencing children's preoperative anxiety. They found that the children of anxious parents who used avoidant coping mechanism, as well as the children whose parents were divorced or separated suffered from higher levels of anxiety than others. Predictors of increased parental anxiety were also among the risk factors (i.e., gender of parents [mothers are more anxious], children's history of repeated hospitalizations, and the mood of parents) (7). In the present study, t-test showed a non-significant difference between mothers' and fathers' anxiety.

Hemmati et al. (2003) conducted a study on 130 parents to assess the anxiety of parents of hospitalized children at the times of admission and discharge. Their results showed that parents' state anxiety level was severe on the admission, while it was at a mild level at hospital discharge. In regard to trait anxiety most of the participants at both times of admission and discharge reported mild level. Trait anxiety is a personal and spiritual anxiety and is not affected by external stimulating factors (e.g. child hospitalization). State anxiety is chronic and constant over time (22). The results of the present study also showed that parents' preoperative state-trait anxiety was moderate to high.

### Implications for Practice

According to the results of this study, we suggested designing and implementing preoperative preparation programs in accordance with the sources of parental anxiety regarding surgical

procedures. Due to the absence of any relationship between educational level and parental anxiety, providing preoperative preparation programs for all parents with different educational levels seems necessary. Further studies with larger sample sizes need to be carried out to assess the predictive factors of parental anxiety level in different medical centers.

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### **Conflict of interest**

The authors declare that there is no conflict of interest.

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