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# STAI Test for Evaluating the Effect of Showing Surgery Videos in the Preoperative Period on the Anxiety Levels of Parents of Children Undergoing Adenoidectomy or Adenotonsillectomy

## Ameliyat Öncesi Dönemde Ameliyat Videolarının Gösterilmesinin Adenoidektomi veya Adenotonsillektomi Olan Çocukların Ebeveynlerinin Kaygı Düzeyleri Üzerindeki Etkisinin STAI Testi ile Değerlendirilmesi

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**ABSTRACT Objective:** This study aims to evaluate the effects of visual education on the anxiety levels of parents of children who will undergo adenoidectomy or adenotonsillectomy by showing the video of the same surgical procedure performed by the same surgeon and subsequently we aimed to determine the factors affecting the anxiety levels. **Material and Methods:** Children (aged 2-12 years) who were planned to undergo adenoidectomy or adenotonsillectomy procedure under general anesthesia in the otorhinolaryngology operating room and their parents (aged 26-45 years) have been included in our study. The questionnaire of Spielberger State Anxiety Scale used for measuring the situational anxiety of subjects has been provided separately to the mothers and fathers. **Results:** When anxiety levels between Questionnaire 1 filled in the preoperative period following verbal and written briefing, Questionnaire 2 filled after the surgery video had been shown to the parents and Questionnaire 3 which was filled after surgery, were evaluated a statistically significant decrease in the anxiety levels was noted ($p<0.001$). When the scores of mothers and fathers for Questionnaire 1 ($p<0.001$) and Questionnaire 2 ($p=0.032$) were compared, the anxiety scores of mothers were found to be statistically significantly higher than those of fathers but when the scores of Questionnaire 3 were compared, mothers had a higher score however the difference did not reach statistical significance ($p=0.118$). **Conclusion:** In our study, we have demonstrated that showing videos of the surgical process in the preoperative period may help to decrease the level of anxiety of parents. Together with the technological advances in the future, more impressive videos and presentations would come into use which may provide newer data to be used in comparative studies.

**Keywords:** Anxiety; adenoidectomy; parents; education; surgery; tonsillectomy

**ÖZET Amaç:** Bu çalışma, aynı cerrahın uyguladığı aynı cerrahi prosedürün videosunu göstererek görsel eğitimin adenoidektomi veya adenotonsillektomi geçirecek çocukların ebeveynlerinin kaygı düzeyleri üzerindeki etkilerini değerlendirmeyi ve ayrıca kaygı düzeylerini etkileyen faktörleri belirlemeyi amaçlar. **Gereç ve Yöntemler:** Ameliyathanenin kulak burun boğaz masasında, genel anestezi altında adenoidektomi veya adenotonsillektomi işlemi yapılması planlanan çocuklar (2-12 yaş arası) ve ebeveynleri (26-45 yaş arası) çalışmaya dahil edildi. Deneklerin durumsal kaygılarını ölçmek için kullanılan Spielberger Durumluk Kaygı Ölçeği anketi, anne ve babalara ayrı ayrı verilmiştir. **Bulgular:** Preoperatif dönemde sözel ve yazılı bilgilendirme sonrası doldurulan Anket 1, ameliyat videosu izletildikten sonra doldurulan Anket 2 ve ameliyat sonrası doldurulan Anket 3 formundaki anksiyete düzeyleri karşılaştırıldığında hem anne hem de babalarda istatistiksel olarak anlamlı düşme saptandı ($p<0.001$). Anne ve babaların Anket 1 skorları karşılaştırıldığında ($p<0.001$) ve Anket 2 skorları karşılaştırıldığında ($p=0.032$) annelerin anksiyete skorları babalara göre istatistiksel olarak daha yüksek saptandı, Anket 3 puanları karşılaştırıldığında, anneler daha yüksek puan almış ancak aradaki fark istatistiksel anlamlılığa ulaşmamıştır ($p=0.118$). **Sonuç:** Biz bu çalışmada ameliyat öncesi ebeveynlere ameliyat videosu izletmenin onların anksiyete düzeylerini azaltmaya yardımcı olabileceğini gösterdik. Bilimdeki ilerlemeyle daha güçlü olabilecek video veya sunumların gelecekte daha fazla kullanılması ile yapılacak karşılaştırmalı çalışmalar yeni veriler sunacaktır.

**Anahtar Kelimeler:** Anksiyete; adenoidektomi; ebeveynler; eğitim; cerrahi; tonsillektomi

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Many parents feel anxious when their children need to undergo surgery or simply when they feel a threat against their children.[1] This anxiety which may occur before, during or after the surgical procedure of their children may be due to worries about the general safety of the child, the adverse effects and risks of anesthesia or due to the concerns about pain and comfort and uncertainties about the outcomes.[2,3] Such anxiety in a moderate level may increase attention and induce useful behavior. However, excessive amounts of anxiety may turn into worry and concerns about the child and the family and may prolong the time to return to normal activities of daily living.[4-7] In recent years, in the field of pediatric surgery, an increasing trend towards outpatient surgeries is remarkable which permits a shorter period of time between admission and surgery. This practice makes it hard for the clinician to inform the patients and their parents about the anesthetic and the surgical process. However, educating parents, informing about the surgical process and obtaining written informed consent are important parts of the procedure and also one of the primary duties and responsibilities of the surgeon. Unanswered questions and misunderstood information would cause parents to feel anxious and worried. Increased anxiety levels of parents may reflect on to the child which may cause the whole process to become even more traumatic.[8-13] One of the most commonly used tests in medicine for measuring the anxiety level is; State-Trait Anxiety Inventory (STAI) scale which was developed by Spielberg et al.[14] This test is performed to evaluate anxiety in the state-trait axis. It is a scale which helps differentiate if the anxiety of a subject is continuous or situational. In this study we aimed to evaluate the effects of visual education on the anxiety levels of parents of children who will undergo adenoidectomy or adenotonsillectomy by showing the video of the same surgical procedure performed by the same surgeon and subsequently we aimed to determine the factors affecting the anxiety levels.

## MATERIAL AND METHODS

Our study has been approved by the clinical studies ethics committee of our hospital (KAEK/2019.05.121) with the number 2019/05/121. The study was conducted from April to October 2019, at University of Health Science, Istanbul Kanuni Sultan Süleyman Education and Research Hospital. Children from classes ASA I and ASA II (aged 2-12 years) who were planned to undergo adenoidectomy or adenotonsillectomy procedure (by using cold dissection+bipolar bleeding control technique) under general anesthesia in the otorhinolaryngology operating room and their parents (aged 26-45 years) have been included in our study. Parents who were previously diagnosed with any type of psychiatric disorder have been excluded from the study. Mental retardation, illiteracy, presence or history of alcohol/substance abuse were also part of the exclusion criteria. The mental and psychological state of the parents was evaluated not only by anamnesis, but also by the author, a psychiatrist, according to DSM-5 (The Diagnostic and Statistical Manual of Mental Disorders) criteria. The study has been conducted in line with the Helsinki Declaration Principles.

Following the decision for surgery, the context of the study and the informed consent texts have been read to the parents and consent for participation to the study has been obtained. Information such as age, educational background, profession, whether the child had been operated before and what kind of operation is being planned had been obtained via face-to-face interviews separately conducted with each parent. Informed consent forms about the surgery have been provided to each parent and they were asked to read it thoroughly. The parents were informed verbally and in written form about the surgery and general anesthesia, that their child will undergo general anesthesia during the operation, why the surgery is going to be performed and finally the risks and complications associated with the procedure. State-Trait Anxiety Inventory (STAI) is a self-reported instrument. It was designed to assess levels of state anxiety and traint anxiety, through 40 items scored by a likert-scale. Afterwards, the questionnaire “STAI FORM TX-1” of Spielberger State Anxiety Scale used for measuring the situational anxiety of subjects has been provided separately to the mothers and fathers and they were asked to fill in the questionnaire with appropriate statements that correspond to the situational anxiety level on the form **(Questionnaire 1)**. At the

time of hospital admission for surgery, a video of the same surgical procedure which is officially being published on Youtube, one of the most common used internet sharing sites, was previously performed by the surgeon, one of the authors of this article who will perform the procedure by using the same technique, had been shown to the parents. The link of adenoidectomy video: https://www.youtube.com/watch?v=jMv_V-oRW7o. The link of adenotonsillectomy video: https://www.youtube.com/watch?v=4stghp D0kuQ. None of the patients had any bleeding complications that would require taking them back to the operating room after surgery. The aim of this approach was to educate and inform the parents via visual exposure. This technique corresponds to psychoeducation which is the first module of cognitive behavioral therapy which is commonly used in treatment of anxiety disorders.[15] This way, the parents are expected to be informed about the surgery that their child is going to go through. The mother and the father were separately asked to fill in the STAI FORM TX-1 for a second time **(Questionnaire 2)**. At least 8 hours after the completion of the child's surgery, the parents were asked to fill in the STAI FORM TX-1 for the third time **(Questionnaire 3)**. Special attention was paid to make sure that all mothers and fathers fill in the form separately. The form was considered invalid if more than three questions were left unanswered on the STAI scale questionnaire. In total, each mother and father filled 3 STAI FORM TX-1, and the questionnaires on these forms (Questionnaire 1, Questionnaire 2, Questionnaire 3) have been graded to calculate the STAI score. The scores on these forms ranged between 20 to 80, a score ≤35 indicated absence of anxiety, scores between 36 to 41 indicated mild anxiety and a score ≥42 indicated severe anxiety.

### STATISTICAL ANALYSIS

Statistical Package for Social Sciences (SPSS) 21.0 software has been used for statistical analysis. Descriptive data have been represented as mean value±standard deviation. Shapiro-Wilk test has been used to evaluate if the data had a normal distribution. The comparison of tests A1, A2 and A3 has been carried out via ANOVA for repeated measures. In case of statistical significance, posthoc Bonferroni correction test has been performed in order to determine the test of origin for the difference. $p<0.05$ has been regarded as statistically significant.

## RESULTS

In our study, the median age of 30 children was 7.07±2.76 years, while the median age of 60 parents (30 mothers + 30 fathers) was 33.27±5.02 years. Of parents, 45 (75%) were between the ages 26 to 35 years, 15 (25%) were between 36 to 45 years, of children, 13 (43.3%) were between 2 to 6 years and 17 (56.7%) were between 7 to 12 years. Of children to be operated, 18 (60%) were male and 12 (40%) were female. The demographics of children and their parents are presented on Table 1.

When anxiety levels between Questionnaire 1 filled in the preoperative period following verbal and written briefing, Questionnaire 2 filled after the surgery video had been shown to the parents and Questionnaire 3 which was filled after surgery, were evaluated a statistically significant decrease in the anxiety levels was noted ($p<0.001$) (Table 2). When the scores of mothers and fathers for Questionnaire 1 ($p<0.001$) and Questionnaire 2 ($p=0.032$) were compared, the anxiety scores of mothers were found to be statistically significantly higher compared to fathers but when the scores of Questionnaire 3 were compared, mothers had a higher score however the difference did not reach statistical significance ($p=0.118$).

According to the analysis by educational status, there was no statistically significant difference between fathers and mothers however, higher anxiety scores were noted for university graduates compared to high school graduates and similarly high school graduates had higher scores compared to secondary school graduates. When we compared the scores from Questionnaire 1, Questionnaire 2 and Questionnaire 3 for parents who are university graduates, high school graduates and secondary school graduates, a statistically significant decrease was present for both fathers and mothers (Table 3).

When the anxiety scores of parents were analyzed according to the age group of the parents, the scores were found to be higher for the age group 36

**TABLE 1:** Demographic characteristics of parents and children.

| | The average age (Mean±SD) | Age range | Median value | 26-35 age | 36-45 age |
|---|---|---|---|---|---|
| Mother (n=30) | 32.2±5.22 | 26-45 | 31 | 24 | 6 |
| Father (n=30) | 34.33±4.66 | 27-44 | 33.5 | 19 | 11 |
| Mother+Father (n=60) | 33.27±5.02 | 26-45 | 32.5 | 43 | 17 |
| Children (n=30) | 7.07±2.76 | 2-12 | 7 | | |

Mean±SD: Average+Standard Deviation.

**TABLE 2:** Comparison of mean anxiety levels of parents after verbal information (Questionnaire 1), surgery video and post-training (Questionnaire 2) and postoperative period (Questionnaire 3).

| | Mother (Mean±SD) n=30 | | | Father (Mean±SD) n=30 | | |
|---|---|---|---|---|---|---|
| | No anxiety (≤35 points) | Mild anxiety (36-41 points) | Severe anxiety (≥42 points) | No anxiety (≤35 points) | Mild anxiety (36-41 points) | Severe anxiety (≥42 points) |
| Questionnaire 1 | 37.53±7.0 (Mean±SD) | | | 34.63±4.98 (Mean±SD) | | |
| | 12 | 8 | 10 | 18 | 9 | 3 |
| Questionnaire 2 | 34.7±6.17 (Mean±SD) | | | 32.7±5.37 (Mean±SD) | | |
| | 16 | 10 | 4 | 21 | 7 | 2 |
| Questionnaire 3 | 31.37±5.75 (Mean±SD) | | | 30.1±4.7 (Mean±SD) | | |
| | 24 | 4 | 2 | 26 | 4 | 0 |
| Questionnaire 1-2 | p<0.001* | | | p<0.001* | | |
| Questionnaire 1-3 | p<0.001* | | | p<0.001* | | |
| Questionnaire 2-3 | p<0.001* | | | p<0.001* | | |

Mean±SD: Average+Standard Deviation; *A p-value <0.05 was considered as significant.

**TABLE 3:** Comparison of Questionnaire 1, Questionnaire 2 and Questionnaire 3 according to educational background of parents.

| | Mother (Mean±SD) n=30 | | | Father (Mean±SD) n=30 | | |
|---|---|---|---|---|---|---|
| | University n=6 (20%) | High School n=17 (56.7%) | Middle School n=7 (23.3%) | University n=9 (30%) | High School n=16 (53.3%) | Middle School n=5 (16.7%) |
| Questionnaire 1 | 38.83±9.68 | 37.59±6.45 | 36.29±6.67 | 35.89±5.86 | 35.44±4.33 | 31.20±3.03 |
| Questionnaire 2 | 36.5±7.58 | 34.41±5.95 | 33.86 ±6.12 | 34.11±4.91 | 33.75±5.27 | 28.20±3.34 |
| Questionnaire 3 | 32.0±6.89 | 31.29±6.01 | 31.00 ±4.83 | 31.22±4.86 | 31.06± 4.43 | 25.40±1.94 |
| Questionnaire 1-2 | p=0.003* | p<0.001* | p=0.001* | p=0.006* | p=0.008* | p=0.008* |
| Questionnaire 1-3 | p=0.049* | p<0.001* | p=0.003* | p<0.001* | p<0.001* | p<0.001* |
| Questionnaire 2-3 | p=0.005* | p<0.001* | p=0.025* | p<0.001* | p<0.001* | p=0.014* |

Mean±SD: Average+Standard Deviation; *A p-value <0.05 was considered as significant.

to 45 years compared to 26 to 35 years however, the difference did not reach statistical significance. When the scores from Questionnaire 1, Questionnaire 2 and Questionnaire 3 were compared for both 26-35 and 36-45 age groups, a statistically significant decrease (p<0.001) has been noted for both fathers and mothers (Table 4).

There was no significant difference between parents' anxiety scores depending on the gender of the child to be operated. There was a statistically significant decrease (p<0.001) in scores of Questionnaire 1, Questionnaire 2 and Questionnaire 3 for parents of children of both genders. When the anxiety scores of parents according to the age group of their children

**TABLE 4:** Comparison of Questionnaire 1, Questionnaire 2 and Questionnaire 3 according to age groups of parents.

| | Parent (Mean±SD) | | Parent Age (Mean±SD) | |
|---|---|---|---|---|
| | Mother | Father | 26-35 Years | 36-45 Years |
| Questionnaire 1 | 37.53±7.0 | 34.63±4.98 | 35.95±6.23 | 36.41±6.30 |
| Questionnaire 2 | 34.7±6.17 | 32.7±5.37 | 33.51±6.08 | 34.18±5.25 |
| Questionnaire 3 | 31.37±5.5 | 30.1±4.7 | 30.72±5.49 | 30.76±4.72 |
| Questionnaire 1-2 | p<0.001* | p<0.001* | p<0.001* | p<0.003* |
| Questionnaire 1-3 | p<0.001* | p<0.001* | p<0.001* | p<0.001* |
| Questionnaire 2-3 | p<0.001* | p<0.001* | p<0.001* | p<0.001* |

Mean±SD: Average+Standard Deviation; *A p-value <0.05 was considered as significant.

were analyzed, statistically significantly (p<0.001) higher scores were found for parents of children aged between 2 to 6 years compared to those aged between 7 to 12 years. When the anxiety scores of Questionnaire 1, Questionnaire 2 and Questionnaire 3 were compared between the parents of children between the age 2 to 6 and 7 to 12, a statistically significant decrease (p<0.001) was noted (Table 5).

When the scores were analyzed according to the surgery to be performed, although not statistically significant, the anxiety scores of parents of children to undergo adenoidectomy were higher compared to those of who were going to undergo adenotonsillectomy. There was a statistically significant decrease (p<0.001) in scores of Questionnaire 1, Questionnaire 2 and Questionnaire 3 for parents of children who were going to undergo adenoidectomy or adenotonsillectomy. Although not statistically significant, the anxiety scores of parents whose children have never been operated before were higher compared to the ones whose children were operated before. When scores of Questionnaire 1, Questionnaire 2 and Questionnaire 3 were compared, a statistically significant decrease (p<0.001) was noted in the scores of parents whose children haven't been operated before. Among parents whose children have been operated before, when the anxiety scores of Questionnaire 2 and Questionnaire 3 were compared, a statistically significant decrease has been shown (p=0.020), however, the difference between the anxiety scores of Questionnaire 1-Questionnaire 2 and Questionnaire 1-Questionnaire 3 was not statistically significant (p=0.116 and p=0.063, respectively) (Table 6).

When the anxiety scores of Questionnaire 1, Questionnaire 2 and Questionnaire 3 have been compared in terms of parent's profession, significant decreases in all 8 groups have been shown. For some professions the difference was statistically significant while for others it was not (p values are presented in Table 7).

**TABLE 5:** Comparison of Questionnaire 1, Questionnaire 2 and Questionnaire 3 according to gender and age group of children.

| | Children's Gender (Mean±SD) | | Children's Age (Mean±SD) | |
|---|---|---|---|---|
| | Boy n=18 (60%) | Girl n=12 (40%) | 2-6 Years (43.3%) | 7-12 Years (56.7%) |
| Questionnaire 1 | 37.61±7.81 | 37.42±5.91 | 37.81±7.06 | 35.21±5.37 |
| Questionnaire 2 | 34.83 ±6.85 | 34.50 ±5.28 | 35.27±6.62 | 32.65±5.08 |
| Questionnaire 3 | 31.33 ± 6.06 | 31.42± 5.51 | 32.00±5.72 | 29.79±4.82 |
| Questionnaire 1-2 | p<0.001* | p=0.011 | p<0.001* | p=0.011 |
| Questionnaire 1-3 | p<0.001* | p<0.001* | p<0.001* | p<0.001* |
| Questionnaire 2-3 | p<0.001* | p<0.001* | p<0.001* | p<0.001* |

Mean±SD: Average+Standard Deviation; *A p-value <0.05 was considered as significant.

**TABLE 6:** Comparison of Questionnaire 1, Questionnaire 2 and Questionnaire 3 according to the operation to be performed and the child's previous operation.

| | Operation Type (Mean±SD) | | The status of surgery before (Mean±SD) | |
|---|---|---|---|---|
| | Adeno-tonsillectomy (60%) | Adenoid-ectomy (40%) | Operated (20%) | Not Operated (80%) |
| Questionnaire 1 | 35.42±6.16 | 37.08±6.26 | 36.33±7.96 | 37.83±6.90 |
| Questionnaire 2 | 33.25±6.07 | 34.37±5.48 | 35.27±6.62 | 35.08±6.24 |
| Questionnaire 3 | 30.31±5.30 | 31.38±5.20 | 30.50±6.09 | 31.58±5.78 |
| Questionnaire 1-2 | p<0.001* | p<0.001* | p=0.116 | p<0.001* |
| Questionnaire 1-3 | p<0.001* | p<0.001* | p=0.063 | p<0.001* |
| Questionnaire 2-3 | p<0.001* | p<0.001* | p=0.020* | p<0.001* |

Mean±SD: Average+Standard Deviation; *A p-value <0.05 was considered as significant.

**TABLE 7:** Comparison of Questionnaire 1, Questionnaire 2 and Questionnaire 3 according to the occupational group of parents.

| Occupations | Questionnaire 1 | Questionnaire 2 | Questionnaire 3 | Questionnaire 1-2 | Questionnaire 1-3 | Questionnaire 2-3 |
|---|---|---|---|---|---|---|
| Housewife (n=20) | 37.10±6.38 | 33.90±5.77 | 31.25±5.68 | p<0.001* | p<0.001* | p<0.001* |
| Worker (n=11) | 34.55±5.35 | 33.36±6.13 | 30.45±5.33 | p=0.156 | p=0.006* | p<0.001* |
| Police (n=2) | 35.00±1.41 | 31.50±0.70 | 29.5±0.70 | p=0.170 | p=0.112 | p=0.289 |
| Officer (n=10) | 33.90±5.21 | 33.50±4.27 | 30.20±4.49 | p=1.000 | p=0.002* | p=0.003* |
| Teacher (n=7) | 40.00±7.76 | 37.00±7.39 | 32.14±6.41 | p=0.001* | p=0.001* | p<0.001* |
| Self-employment (n=2) | 32.50±0.70 | 30.00±2.82 | 29.5±0.70 | p=0.315 | p=0.263 | p=0.423 |
| Tradesman (n=6) | 32.50±3.56 | 31.17±4.16 | 28.17±3.25 | p=0.706 | p=0.043* | p=0.016* |
| Engineer (n=2) | 34.35±2.25 | 33.24±3.18 | 32.44±1.64 | p=0.614 | p=0.213 | p=0.245 |

Mean±SD: Average+Standard Deviation; *A p-value <0.05 was considered as significant.

## DISCUSSION

Most of the parents have a state of anxiety when their children need to undergo surgery.[1-3] According to the previously published literature, there are studies evaluating whether there is a change in the preoperative anxiety of parents by giving informative brochures, making them watch animations, informing them via the internet or using applications on smart phones.[16-19] Today, the advances in information technologies made video usage possible for psychoeducation materials. By providing more realistic simulations, these applications play an important role in reducing anxiety. Up to date, video-education materials generally consisted of information about risks and complications of anesthesia or general information about situations such as postoperative pain.[11,12,20-24] Our study, which consisted of showing real surgery videos to parents and evaluating its effect on their anxiety will be the first of it's kind in the literature. The videos used in our study are readily available, public videos that can be found on a video sharing website (YouTube).

The results of our study show that, the multimedia education method consisting of exposing parents of children who will undergo adenoidectomy or adenotonsillectomy in the preoperative period to videos of previously performed surgeries decrease the level of anxiety of both fathers and mothers.

While there are studies indicating that the information pamphlets given before the surgery reduce the anxiety level of children and their parents and improve post-operative pain management, there are also studies claiming that these pamphlets do not cause any change on parent/child anxiety level, the frequency/severity of post-operative pain or emergency room visits in the post-operative period.[18,21-26] Smart phone applications are increasingly becoming a part of the perioperative process of patients. These appli-

cations are continuously being developed in order to improve patients' experiences, monitor pre and post-operative precautions and to educate patients and their parents. Yang et al. claimed that these applications substantially increase the level of information of parents about the surgical procedures and complications resulting in significantly lower anxiety levels for both parents and children.[19] It has been reported that the training of 85 patients using a text-message program, which sends short messages to patients and parents before and after tonsillectomy, reduced the anxiety level of the patient and the family during the pre and post-operative period and that none of these patients have reported emergency room visits after surgery.[27]

In a study conducted by Conner-von, an internet-based educational program consisting of recommendations such as things to do after adenotonsillectomy, diet and pain management was provided to patients and their families. It has been reported that this method increased patient and parent satisfaction compared to conventional preoperative verbal education however, it did not have any effect on patient's anxiety level, pain management or parents' anxiety level compared to conventional verbal education or no pre-operative education at all.[28]

In the study conducted by Rodger P. Pinto and James G. Hollandsworth, Jr. a videotape was shown to 60 children who would undergo surgery or their parents.[29] These videotapes were approximately 22 minute long and consisted of 13 scenes. These scenes consisted of events such as hospital admission for elective surgery, the period between admission until discharge including post-operative physical examination etc. According to the results, the anxiety levels of children and parents who have seen the videotape before surgery were lower compared to those who did not see the videotape. In our study, according to the surgery to be performed, a 3-minute-long adenoidectomy operation or a 7 minute 39 second-long adenotonsillectomy operation video has been shown to each parent separately. There was a statistically significant ($p<0.001$) decrease between the anxiety scores for both fathers and mothers measured before seeing the video and after informing the parents via showing the surgery video.

In a study conducted by Joseph F. Cassady, Jr et al. consisting of 43 children who would undergo surgery and 42 children as the control group, a 22-minute-long video explaining anesthesia principles in detail and demonstrating scenes from the perioperative experience of various children at the surgery reception room and other parts of the hospital was shown to the parents.[12] Similarly to our study, in this study the STAI anxiety scores were found to be statistically lower among parents who have seen the video compared to those who did not ($p<0.031$). In this study, the STAI anxiety score before showing the video was 40.56±1.7 compared to 36.0±1.4 after showing the video. In our study, the anxiety score of mothers was 37.53±7.0 which decreased to 34.7±6.17 after watching the video, whereas the pre-video anxiety score of 34.63±4.98 of fathers decreased to 32.7±5.37 following the video exposure. Both differences were statistically significant. We believe that the reason behind having lower average anxiety scores before showing the video in our study is because the parents were informed and educated in verbal and written forms prior to showing the educational video. Additionally, the preoperative anxiety scores of mothers were higher than those of fathers however the difference did not reach statistical significance. This difference might be due to women’s having higher anxiety levels by nature and that anxiety disorders generally have a higher prevalence among women.

According to the study conducted by McEwen et al. in which 55 parents of children who would undergo pediatric surgery have been shown videos and the results were compared with a control group of 56 subjects, it has been demonstrated that video exposure decreased the level of parents' anxiety, however the difference was not statistically significant.[30] The mean STAI anxiety score after video exposure was 37.3 (range 20-72). In this short video of 8 minutes duration, hospital personnel and patients' relatives acted as actors for demonstrating events and procedures related to hospital admission and surgery including anesthesia induction. In our study, the video which was shown to each parent consisted of a child being given anesthesia to sleep and another child genuinely going through the entire surgical proce-

dure. The video did not include an animation nor a movie. In none of the studies conducted before where videos have been used for education, the presence of both the mother and the father has been made obligatory, generally the videos have been watched only by the mother, father, grandmother/father or one of the caregivers alone. In our study, we have also evaluated both parents in terms of age, profession, educational level, the surgical operation to be performed, whether the child has been operated before or not and the gender of the child. We found no significant difference between the anxiety scores of parents with male or female children however, when the anxiety scores of parents according to the age group of their children were analyzed, statistically significantly ($p<0.001$) higher scores were found for parents of children aged between 2 to 6 years compared to those aged between 7 to 12 years. Our results are similar to those obtained from the study conducted by Kain et al. in which the younger age of the child has been suggested as a factor for increased anxiety level for the parents.[31] Although not statistically significant, in our study the anxiety scores of parents whose children have never been operated before were higher compared to the ones whose children were operated before. A parent whose child has been operated before would be more experienced about the pre and postoperative period and more knowledgeable about the majority of the procedures. Thus, having less uncertainties and unanswered questions, compared to a parent whose child has never been operated before, might explain the difference between the anxiety scores.

In our study, although not statistically significant, higher anxiety scores were noted for university graduates compared to high school graduates and similarly high school graduates had higher scores compared to secondary school graduates. This suggests that with the increasing level of education, parents have more ways to reach information thus become aware of all possible risks which consequently causes increased level of anxiety. In our study, the mean anxiety level of parents between 36 to 45 years-of-age was higher compared to those who were between the ages 26 to 35, however this difference did not reach statistical significance. Today, an increase in number of parents having children at an older age is remarkable. We believe that individuals who did not have children for many years for various reasons and then having children at an older age may be more protective of their children which may have affected this situation.

Our study had some limitations. If the study had been conducted with more than 60 parents, the results would have been more valuable however, due to some challenging situations such as the study design being prospective and having to get 3 separate forms filled in by each parent etc. it was not possible to enroll more subjects. Also, although STAI scale which is a well-established test has been used to measure anxiety levels, adding another well accepted test such as Amsterdam Preoperative Anxiety and Information Scale (APAIS) would be even better for estimating anxiety scores. Instead of just two surgical procedures, a study group with more surgical procedures and more parents could have been used in order to conduct a more comprehensive study. Two separate groups of parents could have been formed, one group for real surgery videos and another one for other educational videos (informational videos, animations, cartoons etc.) and they could have been compared with control groups. Comparing these two groups would have provided insight about the amount of impact of real surgery video exposure and would have created a strong hypothesis. In our study, it might be suggested that showing real surgery videos to parents probably created a substantial exposure impact thus having a stronger effect on anxiety levels. Our study is a preliminary study on real surgery video exposure in the field of video-education. More studies are needed in order to establish the effect of education via videos on the anxiety level of parents.

## CONCLUSION

As a consequence, in our study we have demonstrated that showing videos of the surgical process in the preoperative period may help to decrease the level of anxiety of parents. Together with the technological advances in the future, more impressive videos and presentations would come into use which may provide newer data to be used in comparative studies.

### *Conflict of Interest*

*No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.*


### *Source of Finance*

*During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.*


### *Research Involving Human Participants and/or Animals*

*All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.*

### *Informed Consent*

*Informed consent was obtained from all individual participants included in the study.*

### *Authorship Contributions*

***Idea/Concept:*** *Murat Koçyiğit, Gülseren Yılmaz, Umut Mert Aksoy;* ***Design:*** *Murat Koçyiğit, Gülseren Yılmaz;* ***Control/Supervision:*** *Murat Koçyiğit, Gülseren Yılmaz, Umut Mert Aksoy;* ***Data Collection and/or Processing:*** *Murat Koçyiğit, Gülseren Yılmaz, Umut Mert Aksoy;* ***Analysis and/or Interpretation:*** *Murat Koçyiğit, Gülseren Yılmaz, Umut Mert Aksoy;* ***Literature Review:*** *Murat Koçyiğit, Gülseren Yılmaz, Umut Mert Aksoy;* ***Writing the Article:*** *Umut Mert Aksoy, Murat Koçyiğit;* ***Critical Review:*** *Murat Koçyiğit, Gülseren Yılmaz.*

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