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Effects of Preoperative Information Methods on Anxiety in Patients Scheduled for Impacted Third Molar Surgery

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Abstract

BACKGROUND/AIMS: Extraction of impacted I3M teeth is the most common surgical procedure and causes the greatest anxiety in patients. The aim of this study was to measure the effect of verbal, live action, and animated video information on a patient's anxiety level before impacted I3M tooth extraction. The null hypothesis of this study was that there was a decrease in the anxiety levels of patients who were informed of the procedure by watching an animated video.

MATERIALS AND METHODS: The study had prospective cross-sectional design. The study was conducted at the department of oral and maxillofacial surgery. A total of 90 patients who met the inclusion criteria were divided into three groups. Patient anxiety was measured at three different timepoints: pre-information (T0), post-information (T1), and post-operation (T2) using the Modified Dental Anxiety Scale (MDAS), Amsterdam Preoperative Anxiety and Information Scale (APAIS-A), APAIS-B, APAIS-C, State-Trait Anxiety Inventory-1 (STAI-1), STAI-2, and the Hospital Anxiety and Depression Scale (HADS) tests. In addition, the age and gender of the participants were recorded.

RESULTS: When the T0, T1, and T2 timepoint values were examined between the groups, significant differences were observed in the MDAS, APAIS-A, APAIS-B, APAIS-C, and HADS-D values. For T1, MDAS, APAIS-B, and APAIS-C values, the anxiety levels of the group watching an animated video were significantly lower than those of the group watching a live action video.

CONCLUSION: Although it was determined in the study that the three different types of information led to a decrease in the general anxiety level of patients, the superiority of the animated video in reducing the pre-operation anxiety level should be taken into consideration.

Keywords: Impacted third surgery, anxiety, animated video

INTRODUCTION

Dental anxiety (DA) occurs during dental treatments and is defined as tension, stress, anxiety, or anger and frustration experienced by the patient.[1,2] The factors that cause DA include local anesthesia, pain, fear of rotating instruments, and sounds that the patient hears when on the dentist's chair. Impacted mandibular third molar (I3M) surgery, which is one of the most common surgical procedures in dentistry, has been reported to be the most worrying procedure in patients[3]. I3M extraction is associated with pain, swelling, and trismus, apart from the general complications associated with dental treatment. The patient's anticipation of these problems can cause a high level of anxiety before undergoing I3M extraction.[4,5] In addition, DA can also be caused as a result of previous dental experiences.[6] In particular, acute anxiety can cause various physiological (nausea, vomiting, diarrhea, urinary frequency, etc) and behavioral disorders. Extraction of the I3Ms in patients with DA can be difficult not only for patients but also for surgeons. It has been observed that the duration of the operation is significantly longer, the rate of facial swelling is higher, and the pain is higher in patients with DA.[1,7-9]

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Dentists might use a visual analog scale or other specific scales, such as the State-Trait Anxiety Inventory (STAI), the Modified Dental Anxiety Scale (MDAS), or the Intermittent Anxiety Response Scale, to identify anxious patients.[10,11] Conversely, informative videos are widely used to explain surgical procedures. Although the effect of preoperative information techniques on anxiety related to impacted I3M surgery has been investigated in some studies, there is no consensus on the most effective method for reducing DA.[12-15]

In the literature, there are no studies that investigated the effect of informing patients with an animated video of the extraction procedure before I3M tooth extraction and their anxiety level. The aim of this study was to measure the effect of verbal, live-action videos, and animated video information about the procedure on patient anxiety level before impacted I3M tooth extraction. The null hypothesis of this study was that there is no differences between the anxiety levels of patients who were informed about different procedures.

MATERIALS AND METHODS

Study Design and Ethical Considerations

The Declaration of Helsinki was adopted for this study, and the Ankara University Faculty of Dentistry Local Ethics Committee approved this retrospective study (approval number: 36290600/20, date: 08.03.2018). This study included 90 patients who underwent third molar extraction under local anesthesia between September and November 2018 at the Ankara University Faculty of Dentistry, Department of Oral, Dental, and Maxillofacial Surgery. Patients were informed about the study and procedure, and a written informed consent form was provided by the preoperative evaluation clinic. If the patient had additional questions, they were also included in the study.

Power analysis using G*Power was conducted for a study involving repeated measurements (with a repetition of 3) in animated, verbal, and video-based groups (with a total of 3 groups), where data were collected. The foundational analysis in this study relies on repeated measures analysis of variance, with an effect size of 0.30, an α value of 0.05, and a power value (1-β) of 0.80 considered in the power analysis. The total sample size was 75. Therefore, it is recommended to recruit a minimum of 25 participants from each group.

The Spielberger State Anxiety Inventory-State version (STAI-S), Hospital Anxiety (HADS-A) and Depression Scale (HADS-D), MDAS, and Amsterdam Preoperative Anxiety and Information Scale (APAIS) are widely used to assess patient DA and were used in this study. Patient anxiety was measured at three different timepoints: pre-information (T0), post-information (T1), and post-operation (T2) using the MDAS, APAIS-A, APAIS-B, APAIS-C, STAI-1, STAI-2, and HADS tests. In addition, the age and gender of the participants were recorded.

The inclusion criteria were as follows: adults aged 18-40 years, with American Society of Anesthesiologists physical condition scores of I and II, absence of any systemic disease, and those who do not regularly use medications.

The exclusion criteria were an inability to read and understand Turkish, significant impairment in vision or hearing, an existing psychiatric disorder, age under 18 years, previous surgical dental treatment, and watching an informative video on this subject.

Each patient was examined by the same physician who performed the surgical intervention. Patients were divided into three groups:

Group 1: Patients who were verbally informed about I3M extraction before surgery.

Group 2: Patients who were shown a live action video of impacted I3M extraction before surgery.

Group 3: Patients who were shown an animated video about impacted I3M extraction before surgery.

Prior to the surgical intervention, participants in each group received live video, verbal, and animated information separately from the same experienced physician in the operating room. The total duration of these sessions was 10 minutes. Patients were randomly assigned to groups 1, 2, and 3 using an online random allocation software (www.randomization.com). Information was provided to the patients upon completion of the questionnaires. All patients in the waiting room received the MDAS, APAIS-A, APAIS-B, APAIS-C, STAI-1, STAI-2, and HADS questionnaires 60 minutes before surgery. The demographic data section (age and gender) of the form was completed by the patients. After the patients were informed of the different information techniques, the same questionnaires were completed by the patients again.

Surgery was performed by the same physician using the standard technique, and the patient was under local anesthesia without premedication or sedation. In all cases, an envelope was incised, and the mucoperiosteal flap was removed. Impaction of the teeth is related to class II positions B of the Pell & Gregory classification, and the duration of the operation is 15 minutes. A bone incision was made at 40,000 rpm, irrigation was performed using surgical markets and drills, and the impacted tooth was extracted. After controlling the bleeding, the flap was closed with a 3.0 black silk suture. The live and animated videos portrayed every moment of the surgical procedure, from suturing opening to suturing closure, accompanied by sounds specific to the operation. Patients refilled the MDAS, APAIS-A, APAIS-B, APAIS-C, STAI-1, STAI-2, HADS-A, and HADS-D questionnaires in the waiting room 20 minutes after surgery. Questionnaires were filled out by the patients in the same room and at the same table as before surgery. Patients were postoperatively prescribed 1000 mg of amoxicillin and clavulanic acid and 25 mg of dexketoprofen. They were also instructed to use mouthwash with 0.2% chlorhexidine after 1 day and for 1 week. An ice pack was applied to the operation area for at least 60 minutes after the operation. After 1 week, the patients were called for control.

Modified Dental Anxiety Scale

The MDAS was developed by Humphris et al.[16] by incorporating an injection-related question into Corah's Dental Anxiety Scale. This scale employs a five-point Likert-type scale with five options, yielding total scores ranging from 5 to 25.[17,18]

Amsterdam Preoperative Anxiety and Information Scale

In 1996, Moerman et al.[19] developed the APAIS, which is used to assess preoperative anxiety. This test categorizes anxiety into three sources: anxiety about anesthesia (APAIS-A), anxiety about lack of information (APAIS-B), and anxiety about surgery (APAIS-C). The APAIS consists of six statements related to these sources to evaluate anxiety. To standardize the questionnaire, each statement was assigned a numerical value

based on a five-point Likert scale indicating severity, ranging from 1 to 5 (1=none, 2=mild, 3=moderate, 4=severe, and 5=extreme severity). Anesthesia anxiety was determined by summing the scores of questions 1 and 2, surgical anxiety by questions 4 and 5, and overall anxiety by all six questions. Questions 3 and 6 assessed the desire for information regarding anesthesia and surgery, respectively. Scores on the APAIS range from 6 (lowest) to 30 (highest).[19]

Hospital Anxiety and Depression Scale

The Hospital Anxiety and Depression Scale (HADS) is a four-point Likert-type scale developed by Zigmond and Snaith[20] to assess the risk of anxiety and depression in patients, as well as to measure the severity and changes in these conditions. The HADS comprises a total of 14 questions, where odd-numbered questions evaluate anxiety and even-numbered questions evaluate depression. The scale is divided into two subscales: anxiety (HAD-A) and depression (HAD-D). Based on a study conducted in Turkey, the cut-off score for the anxiety subscale was 10/11, while that for the depression subscale was 7/8. Therefore, patients who scored above these thresholds were identified as at risk. Scores on both subscales ranged from 0 (lowest) to 21 (highest). HADS is often preferred because it focuses on psychological symptoms rather than physical symptoms associated with anxiety and depression.[20]

Speilberger State Anxiety Inventory

The STAI-S is extensively employed in anxiety research, although it is not specifically designed for DA. This inventory consists of two scales, each comprising 20 items that assess state and trait anxiety levels. STAI-trait (STAI-1) measures a patient's underlying or enduring anxiety level, while STAI-state (STAI-2) gages their current anxiety level. Each of the 20 items was rated on a four-point scale. Scores on the STAI range from 20 to 80, with interpretations typically categorized as follows: scores of 20 to 37 indicate no or low anxiety, scores of 38 to 44 indicate moderate anxiety, and scores of 45 to 80 indicate high anxiety levels.[22,23]

Statistical Analysis

The data collected in this study were analyzed using SPSS 25.0 software. Descriptive statistics, including mean, standard deviation, minimum, median, and maximum, were employed to summarize the data. Additionally, the Shapiro-Wilk test was used to assess the normality of the data distribution. The assumption of homogeneity of variance was tested using the Levene's test. For comparisons involving more than two dependent groups with normally distributed data, repeated measures analysis of variance (ANOVA) was conducted. For data that did not exhibit normal distribution, Friedman's analysis was performed instead. Bonferroni's analysis was performed following any statistically significant differences between measurements. The significance level was set at $p<0.05$ and $p<0.01$. While gathering data, the researchers conducted one-on-one interviews. We only recorded the scores without collecting sub-questions; therefore, we could not assess reliability. However, in the studies where we obtained the scales, the Cronbach's alpha coefficient was high. Effect sizes (Eta-squared, η^2) indicating the proportion of variance in dependent variables explained by each independent variable (survey method) are reported in Tables 1-5. Eta-squared values were interpreted using Cohen's guidelines, where values of 0.02, 0.13, and 0.26 or above correspond to small, medium, and large effect sizes, respectively. These effect sizes were calculated to assess the impact of each survey method on anxiety measures to ensure transparency and reliability of the study findings.

RESULTS

Out of the 127 patients initially assessed, 37 did not meet the inclusion criteria, leaving 90 who met the criteria and consented to participate. Among them, 22 had a prior surgical dental treatment history, and 11 declined to complete the postoperative questionnaires. Consequently, the study included 90 patients (20 females and 10 males, aged 18 to 40 years). The patient recruitment process is depicted in the Consolidated Standards of Reporting Trials flowchart (Figure 1).

There were no statistically significant differences between groups in terms of mean age ($p=0.621$; Table 1), and the distribution of males and females was similar across groups ($p=0.105$; Table 2).

Evaluation of anxiety levels at T0, T1, and T2 timepoints for patients receiving verbal information (group 1) revealed that T2 APAIS-B values were significantly lower than T0 APAIS-B values. Additionally, T2 STAI-I values were significantly lower than T1 STAI-I values ($p<0.05$; Table 3).

For patients who were informed through live action video (group 2), evaluation of anxiety levels at the T0, T1, and T2 time points revealed that the T2 MDAS values were lower than the T0 and T1 MDAS values. Moreover, T2 APAIS-B values were significantly lower than T1 APAIS-B values (Table 4).

Analysis of anxiety levels at T0, T1, and T2 for patients informed through animated videos (group 3) revealed that T2 APAIS-A values were lower than T0 APAIS-A values (Table 5).

Comparing T0, T1, and T2 anxiety levels across all groups (Table 6) revealed differences in MDAS, APAIS-A, APAIS-B, APAIS-C, and HADS-D scores. Specifically, T1 MDAS values were significantly lower in patients

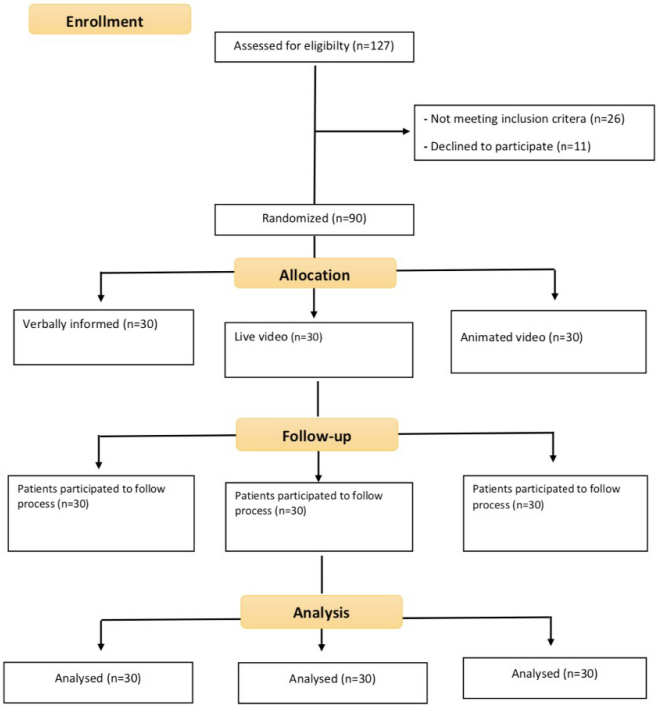

Figure 1. The patient recruitment process is explained in the consolidated standards of reporting trials flowchart.

who were informed through animated videos than in those who were informed through live action videos. Additionally, APAIS-A values at T1 were significantly lower in patients informed through animated and live action videos than in those informed verbally. T1 APAIS-B and APAIS-C values were significantly lower in the animated video group than in the live action video group. Lastly, T1 HADS-D values were significantly lower in the animated video group than in the verbal information group.

Table 1. Distribution of age by group

Age							ANOVA test	p	Effect size
	n	Min.	Median	Max.	Mean	SD	F		
Group 1	30	18	24	33	24.17	3.82	2.31	0.105	0.050
Group 3	30	18	23	31	23.43	3.48			
Group 2	30	18	25	32	25.43	3.64			

*p<0.05. Min.: Minimum, Max.: Maximum, SD: Standard deviation.

Table 2. Gender distribution by group

n		Group 1		Group 2		Group 3		Chi-square test	p	Effect size
		%	n	%	n	%				
Gender	Male	10	33.3	7	23.3	10	33.3	X^2=0.952	0.621	0.008
	Female	20	66.7	23	76.7	20	66.7			

*p<0.05.

Table 3. Comparative analyses of surveys conducted after patients were verbally informed about the surgical procedure

		n	Min.	Median	Max.	Mean	SD	Test	p	Effect size	Bonferroni	p
MDAS	T0	30	5	14	22	13.4	4.14	F=1.858	0.180	0.060		
	T1	30	5	14	22	13.3	4.37					
	T2	30	5	14	21	12.53	4.06					
APAIS-A	T0	30	3	5	9	5.23	1.96	X^2=0.844	0.656	0.014		
	T1	30	2	5	8	5.2	1.92					
	T2	30	2	5	10	4.97	1.99					
APAIS-B	T0	30	3	5	10	5.9	2.14	X^2=12.36	0.002*	0.206	T2<T0	0.002*
	T1	30	2	5	10	5.73	2.36				T2<T1	0.015*
	T2	30	2	5	10	5.27	2.24					
APAIS-C	T0	30	2	4	9	4.8	1.83	X^2=0.553	0.758	0.009		
	T1	30	2	4	10	4.87	2.11					
	T2	30	2	4	10	4.73	2.03					
STAI-2	T0	30	32	45.5	51	45.03	4.56	X^2=2.48	0.289	0.041		
	T1	30	39	45	66	45.67	4.46					
	T2	30	39	45	62	45.53	4.13					
STAI-1	T0	30	27	41	50	39.6	6.35	X^2=8.985	0.011*	0.150	T2<T1	0.002*
	T1	30	20	42	50	40.07	7.30					
	T2	30	20	41	46	38.43	6.80					
HADS-A	T0	30	3	7	17	7.43	3.52	F=1.119	0.333	0.037		
	T1	30	0	7	18	7.77	4.25					
	T2	30	0	7	12	6.67	3.25					
HADS-D	T0	30	3	6	12	7.23	2.96	F=0.589	0.500	0.020		
	T1	30	0	7	13	6.93	3.69					
	T2	30	0	7	20	6.7	4.29					

F: Analysis of variance, X^2: Friedman test, *p<0.05, Min.: Minimum, Max.: Maximum, SD: Standard deviation, MDAS: Modified Dental Anxiety Scale, APAIS: Amsterdam Preoperative Anxiety and Information Scale, STAI: State-Trait Anxiety Inventory, HADS: Hospital Anxiety and Depression Scale.

Table 4. Comparative analyses of surveys conducted after patients were informed about the surgical procedure using live action video

		n	Min.	Median	Max.	Mean	SD	Test	p	Effect size	Bonferroni	p
MDAS	T0	30	6	12.5	22	12.97	3.68	F=14,261	0.001*	0.330	T2<T0 T2<T1	0* 0*
	T1	30	6	15	24	14.73	4.26					
	T2	30	6	12	19	11.87	2.99					
APAIS-A	T0	30	2	3	8	3.87	1.61	X^2=2,000	0.368	0.033		
	T1	30	2	4	10	3.97	1.87					
	T2	30	2	4	7	3.7	1.32					
APAIS-B	T0	30	2	6	10	5.77	1.92	F=12,719	0.000*	0.305	T2<T0 T2<T1	0.011* 0*
	T1	30	2	6	10	6.6	2.04					
	T2	30	2	5	10	4.93	1.86					
APAIS-C	T0	30	2	5	8	5.27	1.48	F=2,933	0.086	0.092		
	T1	30	2	6	10	5.7	1.8					
	T2	30	2	5	8	5.1	1.52					
STAI-2	T0	30	3	47	56	47.1	4.25	F=3,066	0.057	0.096		
	T1	30	40	46	56	46.03	3.66					
	T2	30	40	46	56	46.03	3.85					
STAI-1	T0	30	29	40	53	39.83	4.52	X^2=3,352	0.187	0.056		
	T1	30	32	40	55	40.8	4.81					
	T2	30	32	39	51	39.9	3.06					
HADS-A	T0	30	2	7.5	16	7.6	3.29	X^2=1,581	0.454	0.026		
	T1	30	2	8	13	8.17	3.22					
	T2	30	1	8	13	7.7	2.76					
HADS-D	T0	30	1	5.5	10	5.47	2.56	X^2=5,531	0.063	0.092		
	T1	30	1	6	13	5.8	2.73					
	T2	30	1	5	12	5.23	2.62					

F: Analysis of variance, X^2: Friedman test, *p<0.05, Min.: Minimum, Max.: Maximum, SD: Standard deviation, MDAS: Modified Dental Anxiety Scale, APAIS: Amsterdam Preoperative Anxiety and Information Scale, STAI: State-Trait Anxiety Inventory, HADS: Hospital Anxiety and Depression Scale.

DISCUSSION

Anxiety experienced before impacted I3Ms is a common clinical problem that leads to many consequences, such as prolonged processing time, increased postoperative pain, slowed recovery, and even postponed treatment.[2] Managing patients' preoperative anxiety remains a major challenge in maxillofacial surgery, regardless of newly developed surgical and pharmacological techniques.[24] Various scales have been developed to assess all aspects of DA. It has been reported that filling out these scales before treatment does not have a negative effect on the fear and anxiety level of the patients.[16]

To ensure the reliability of clinical trial data, one or more scales were used to evaluate DA. Schuurs and Hoogstraten[25] compared six different scales and found that the scales were not sufficient to evaluate their findings. Patient anxiety before surgery may be caused by the hospital environment, anesthesia, surgical procedure, postoperative pain anxiety, or previous dentist experiences. Multiple scales are needed to measure DA in all aspects. In this study, four different scales were used to better analyze the source of DA and the obtained results. The MDAS, APAIS, STAI, and HADS scales were preferred for this study because they were understandable, easy to use, and suitable for statistical studies.

In many studies, it has been observed that informing patients of different techniques can reduce their anxiety levels.[12] However, other studies have shown that the level of anxiety increases depending on the surgical technique.[26] Other studies have measured the anxiety levels of patients after receiving verbal information.[14,27] In this study, there was no significant decrease in patient anxiety level according to the pre-information (T0) and post-information (T1) scales for those who received verbal information. Only after the operation did a significant decrease in the APAIS-B and STA-I scale scores. This significant decrease may be due to patients' satisfaction with the information given and their trust in the doctor. In the literature, many studies have measured patient anxiety caused by watching informative videos about the surgical procedure.[2,12,14,22,23,27,28] Although there are studies reporting that watching informative videos before surgery reduces anxiety in patients,[12] others have reported that watching videos does increases[2,14] the level of anxiety. Kazancioglu et al.[2] reported that in their study of 300 patients who applied to the clinic for I3M tooth extraction, the level of anxiety increased in patients who were shown videos before the operation. In this study, patients who were informed by watching videos had significantly lower postoperative (T2) MDAS and APAIS-B scale scores. There was no significant difference between the T0 and T1 time points. The contradictory results of the studies might have

Table 5. Comparison of surveys conducted after patients were informed about the surgical procedure using animated video

		n	Min.	Median	Max.	Mean	SD	Test	p	Effect size	Bonferroni	p
MDAS	T0	30	5	12	21	11.9	3.95	X^2=1,326	0.515	0.022		
	T1	30	6	11.5	20	11.57	3.71					
	T2	30	5	11	18	10.67	3.91					
APAIS-A	T0	30	2	3	9	3.73	1.68	X^2=8,291	0.016*	0.138	T2<T0	0.05*
	T1	30	2	3	8	3.4	1.75					
	T2	30	2	2	6	2.93	1.36					
APAIS-B	T0	30	2	5	10	4.53	2.03	X^2=1,373	0.503	0.023		
	T1	30	2	5	8	4.77	1.65					
	T2	30	2	4	10	4.13	2.11					
APAIS-C	T0	30	2	4.5	9	4.47	1.96	X^2=2,469	0.291	0.041		
	T1	30	2	4	10	4.63	1.99					
	T2	30	2	4	10	4	2.24					
STAI-2	T0	30	32	44.5	57	44.93	5.63	X^2=1,564	0.458	0.062		
	T1	30	36	45.5	80	46.83	7.92					
	T2	30	31	43.5	55	44.33	5.39					
STAI-1	T0	30	28	38	51	38.37	5.88	X^2=3,784	0.151	0.063		
	T1	30	32	38	80	39.8	8.85					
	T2	30	31	42	75	41.77	8.74					
HADS-A	T0	30	0	7	19	6.87	3.76	X^2=1,312	0.519	0.022		
	T1	30	2	7	15	6.5	2.69					
	T2	30	0	6	13	6.03	3.3					
HADS-D	T0	30	0	4.5	10	4.8	2.38	F=1,249	0.290	0.041		
	T1	30	0	5	9	4.53	2.53					
	T2	30	0	4.5	15	5.23	3.77					

F: Analysis of variance, X^2: Friedman test, *p<0.05, Min.: Minimum, Max.: Maximum, SD: Standard deviation, MDAS: Modified Dental Anxiety Scale, APAIS: Amsterdam Preoperative Anxiety and Information Scale, STAI: State-Trait Anxiety Inventory, HADS: Hospital Anxiety and Depression Scale.

varied depending on the viewing content and cultural structure of the population. Although the images and sounds are explanatory and comforting for some patients, they can also be disturbing for others. Conversely, patients might have already watched online videos about the surgical procedure, some of which could have presented misleading content.[29]

In this study, the low anxiety levels observed in the postoperative tests (T2) could be attributed to the fact that the operation was completed. Although verbal and video information was found not to affect preoperative anxiety levels, reduced postoperative anxiety levels suggest that it may be useful for reducing DA in future dental procedures.

To date, there are only few published reports supporting the use of 2D cartoon animations to inform patients about different surgical aspects. Tou et al.[30] showed animated videos to patients before bowel surgery and reported a decrease in anxiety levels. The null hypothesis of this study was that animated videos led to a greater decrease in anxiety levels than verbal and live action video content. Low anxiety levels were found in the postoperative tests (T2), which is an expected result due to the fact that the operation had been completed. An important finding of this study concerns the differences between the values in the post-information (T1) tests. Accordingly, the T1 MDAS, APAIS-A, APAIS-B, and APAIS-C values of patients who watched the animated video were significantly lower than the T1 values of the other groups. In addition, the T1 HADS-D values of patients who were shown live action and animated videos were lower than those who were verbally informed. This study showed that animated videos were more successful in reducing preoperative anxiety than other methods. In the animated video, blood and tools did not look as invasive as they did in the live action video, which allowed the patient to see images that the patient could not imagine from the verbal information. The moment when patients and surgeons have the most problems is when the operation takes place; thus, the method of informing the patient with an animated video should be carefully evaluated. Finally, the development of animated videos can influence and improve the dialog between patients and physicians.

Sancak and Akal[15] evaluated the effect of different preoperative verbal and written information on DA using different scales and observed that written information reduced postoperative anxiety scores. In this study, the fact that the written information was not evaluated can be considered a limitation of the study.[15]

Animated videos can be a useful technique to reduce DA. This study can be expanded to reduce the level of DA before different surgical techniques and to help determine the variability of animated videos

Table 6. Comparison of the types of surveys conducted in the groups

		Group	n	Min.	Median	Max.	Mean	SD	Test	p	Effect size	Bonferroni	p
MDAS	T0	1	30	5	14	22	13.4	4.14	F=1,158	0.319	0.026		
		2	30	6	12.5	22	12.97	3.68					
		3	30	5	12	21	11.9	3.95					
	T1	1	30	5	14	22	13.3	4.37	F=4,436	0.015*	0.093	G3<G2	0.011
		2	30	6	15	24	14.73	4.26					
		3	30	6	11.5	20	11.57	3.71					
	T2	1	30	5	14	21	12.53	4.06	X^2=3,532	0.171	0.018		
		2	30	6	12	19	11.87	2.99					
		3	30	5	11	18	10.67	3.91					
APAIS-A	T0	1	30	3	5	9	5.23	1.96	X^2=11,489	0.003*	0.109	G3<G1 G2<G1	0.023*
		2	30	2	3	8	3.87	1.61					
		3	30	2	3	9	3.73	1.68					
	T1	1	30	2	5	8	5.2	1.92	X^2=15,155	0*	0.151	G3<G1 G2<G1	0.010*
		2	30	2	4	10	3.97	1.87					
		3	30	2	3	8	3.4	1.75					
	T2	1	30	2	5	10	4.97	1.99	X^2=20,336	0*	0.210	G3<G1 G2<G1	0.000*
		2	30	2	4	7	3.7	1.32					
		3	30	2	2	6	2.93	1.36					
APAIS-B	T0	1	30	3	5	10	5.9	2.14	X^2=7,674	0.022*	0.065	G3<G2	
		2	30	2	6	10	5.77	1.92					
		3	30	2	5	10	4.53	2.03					
	T1	1	30	2	5	10	5.73	2.36	F=6,057	0.003*	0.122	G3<G2	0.002*
		2	30	2	6	10	6.6	2.04					
		3	30	2	5	8	4.77	1.65					
	T2	1	30	2	5	10	5.27	2.24	X^2=5.43	0.066	0.039		
		2	30	2	5	10	4.93	1.86					
		3	30	2	4	10	4.13	2.11					
APAIS-C	T0	1	30	2	4	9	4.8	1.83	X^2=4,882	0.087	0.033		
		2	30	2	5	8	5.27	1.48					
		3	30	2	4.5	9	4.47	1.96					
	T1	1	30	2	4	10	4.87	2.11	X^2=6,527	0.038*	0.052	G3<G2	0.015*
		2	30	2	6	10	5.7	1.8					
		3	30	2	4	10	4.63	1.99					
	T2	1	30	2	4	10	4.73	2.03	X^2=8,298	0.016*	0.072	G3<G2	0.010*
		2	30	2	5	8	5.1	1.52					
		3	30	2	4	10	4	2.24					
STAI-2	T0	1	30	32	45.5	51	45.03	4.56	X^2=3,182	0.204	0.013		
		2	30	39	47	56	47.1	4.25					
		3	30	32	44.5	57	44.93	5.63					
	T1	1	30	39	45	66	45.67	4.46	X^2=0.546	0.761	0.002		
		2	30	40	46	56	46.03	3.66					
		3	30	36	45.5	80	46.83	7.92					

F: Analysis of variance, X^2: Friedman test, *p<0.05, Min.: Minimum, Max.: Maximum, SD: Standard deviation, MDAS: Modified Dental Anxiety Scale, APAIS: Amsterdam Preoperative Anxiety and Information Scale, STAI: State-Trait Anxiety Inventory, HADS: Hospital Anxiety and Depression Scale.

for age- and sex-specific anxiety. With the development of technology and the increase in screen use from an early age, the effect of animated videos on DA in children requires further study.

Study Limitations

In this study, the patient population was limited to individuals aged 18-40 years, as those with any previous dental surgery experience were excluded from the study. As previously reported, earlier dental experiences can affect the anxiety level of patients.[31] Although dental surgery might not be performed, patients can experience a fear of anesthesia and rotary instruments during other dental procedures. This fear might have caused differences in the answers to the scales, especially about anesthesia, which is a limitation of the study.

CONCLUSION

Although it was determined in the study that three different types of information led to a decrease in the general anxiety level of patients, the superiority of animated videos in reducing anxiety levels before an operation should be taken into consideration. Testing this method with different operations and techniques could help reduce DA in patients.

MAIN POINTS

- Animated videos can be a useful technique to reduce dental anxiety (DA).
- The development of animated videos can influence and improve the dialogue between patients and doctors.
- With the development of technology and the increase in screen use from an early age, the effect of animated videos on DA in children requires further study.

ETHICS

Ethics Committee Approval: the Ankara University Faculty of Dentistry Local Ethics Committee approved this retrospective study (approval number: 36290600/20, date: 08.03.2018).

Informed Consent: Patients were informed about the study and procedure, and a written informed consent form was provided by the preoperative evaluation clinic.

Authorship Contributions

Surgical and Medical Practices: M.E.Y., M.Ö., E.P.B., Concept: M.E.Y., M.Ö., E.P.B., Design: M.E.Y., M.Ö., E.P.B., Data Collection and/or Processing: M.E.Y., M.Ö., E.P.B., Analysis and/or Interpretation: M.E.Y., M.Ö., E.P.B., Literature Search: M.E.Y., M.Ö., E.P.B., Writing: M.E.Y., M.Ö., E.P.B.

DISCLOSURES

Conflict of Interest: No conflict of interest was declared by the authors.

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