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Case Report

Effect of Visual and Verbal Information on Dental Anxiety in Patients Undergoing Impacted Mandibular 3rd Molar Surgery

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Abstract

Objective: Dental anxiety is a significant concern that affects patient compliance and overall treatment outcomes. This study aims to evaluate the impact of visual and verbal information on dental anxiety in patients undergoing impacted mandibular third molar surgery. By comparing these two information delivery methods, the study seeks to determine whether one approach is more effective in reducing anxiety levels and improving patient experience.

Methods: A total of 73 patients requiring third molar extraction participated in this study. They were randomly assigned into two groups: an experimental group (n = 37) receiving video-based information and a control group (n = 36) receiving verbal information. Anxiety levels were measured preoperatively and postoperatively using the Modified Dental Anxiety Scale (MDAS) and the State-Trait Anxiety Inventory (STAI-S, STAI-T). The video-based information provided a step-by-step visual guide of the surgical procedure, while the verbal information was delivered directly by the clinician. Statistical analyses were conducted using SPSS 24, employing t-tests and ANOVA to assess the effectiveness of both methods.

Results: The results indicated no statistically significant difference in anxiety reduction between the two groups ($p > 0.05$). While both video-based and verbal information contributed to lowering anxiety levels, neither method proved to be significantly superior. Video-based education enhanced comprehension and procedural awareness, while verbal communication allowed for interactive clarification of patient concerns. The findings suggest that individual differences in learning styles may influence the effectiveness of anxiety reduction strategies.

Conclusion: Both visual and verbal information methods can be beneficial in reducing dental anxiety among patients undergoing third molar surgery. However, the choice of the most effective method should be tailored to individual patient preferences. Future research should explore the integration of multimodal educational strategies, including interactive and personalized approaches, to enhance patient understanding and anxiety management.

Keywords: Dental Anxiety; Third Molar Surgery; Visual Information; Verbal Information; Patient Education; Anxiety Management; Multimodal Strategies

Abbreviations

MDAS: Modified Dental Anxiety Scale; STAI-S: Spielberger Anxiety Scale- State Anxiety Scale; STAI-T: Spielberger Anxiety Scale-Trait Anxiety

Introduction

Dental anxiety is a common and complex problem that poses significant challenges for both individuals and healthcare professionals. Dental anxiety, defined as a state of intense anxiety that occurs before a dental visit or treatment, is a serious public health problem that negatively affects the quality of life and general health status of individuals, and despite modern advances in dentistry and advanced treatment methods, it remains one of the most common reasons why individuals neglect their oral health [1-3]. This situation triggers a vicious cycle in which complications caused by untreated oral and dental diseases can worsen an individual's general health status [2-5].

Dental anxiety is a multidimensional phenomenon resulting from the interaction of many interrelated extrinsic and intrinsic factors that profoundly affect individuals' feelings, thoughts and behaviors towards dental services. Extrinsic factors usually stem from past negative clinical experiences, painful or traumatic dental treatments, or negative stories conveyed through family, friends or the media. Such experiences can shape individuals' perceptions of dental treatment and lead to an intensification of fear and anxiety. Intrinsic factors include psychiatric aspects; the presence of multiple phobias, mood disorders and genetic predisposition can exacerbate dental anxiety. The intersection of these extrinsic and intrinsic factors affects individuals' emotional and psychological responses to dental visits and treatments in a complex network [6-8]. Individuals with high levels of dental anxiety often tend to postpone or completely avoid necessary dental treatments. This avoidance behavior leads to the development of more serious oral and dental health problems, requiring future interventions that may be more invasive and traumatic. This creates a vicious cycle in which untreated problems progress, exacerbating the individual's dental anxiety and reinforcing their reluctance to seek treatment. This vicious cycle seriously affects individuals' oral and dental health as well as their quality of life, clearly demonstrating the importance of addressing dental anxiety with holistic and patient-centered approaches [9-11].

The prevalence rates and severity of dental anxiety vary according to variables such as age, gender and socio-cultural background. Studies show that women experience higher levels of dental anxiety than men, and children have the highest prevalence rates, approximately 43% [12]. It has also been reported that dental anxiety generally decreases with age and that its long-term effects begin in childhood and persist [13].

Surgical extraction of impacted third molars stands out as one of the dental procedures most commonly associated with severe dental anxiety. This common oral surgery is characterized by high levels of anxiety in most patients, triggered by multiple factors. The main factors that increase anxiety levels include patient expectations of pain and discomfort, recall of past negative experiences with similar procedures, and lack of communication between the patient and the dentist. Such high levels of anxiety may be manifested by physiological symptoms such as restlessness and excessive sweating, as well as behavioral responses such as resistance or outright refusal to treatment [10,14-16]. The complex and interactive nature of these factors creates serious barriers to patients' demand for and effective utilization of necessary oral health services. Therefore, the management of the high anxiety caused by impacted third molar surgery should not be limited to focusing only on the surgical intervention, but also reveals that patient-centered, holistic approaches should be adopted. This emphasizes the critical importance of effectively addressing dental anxiety, both to increase patient compliance with treatment processes and to improve long-term oral health outcomes [13].

Understanding the etiology and symptoms of dental anxiety is critical to developing effective interventions to reduce its negative effects. Identifying patients' individual triggers and implementing personalized interventions accordingly can lead to better oral health outcomes as well as improving the patient experience.

This study aims to provide valuable findings to reduce fear and improve patient care by examining the effect of visual and verbal information on dental anxiety during buried mandibular third molar surgery.

Materials and Methods

Our study was conducted with the approval of the ethics committee of Gazi University Faculty of Dentistry Clinical Research

Ethics Committee dated 26.12.2023 and numbered E-77082166-302.08.01- 848588.

This study was conducted with a total of 73 patients who applied to Gazi University Faculty of Dentistry, Department of Oral and Maxillofacial Surgery for extraction of impacted wisdom teeth and who voluntarily agreed to participate in the study.

Patients with psychiatric disorders, illiteracy, pregnant and lactating women, and patients under 18 years of age were excluded. Systemically healthy, 73 volunteer patients between the ages of 18 and 34 who agreed to participate in the study were randomized/randomly divided into two groups. Age, gender and educational status of all patients was recorded.

The aim of this study was to examine the effect of video and verbal information on the STAI-S and MDAS scores of patients undergoing impacted wisdom tooth extraction surgery. For this purpose, a pretest, posttest and control group design were established by forming an experimental group informed by video and a control group informed verbally.

- **Video Information Group (Group 1/Experiment):** Patients in this group were shown a video on an accessible and online platform that included the stages of embedded 20-year-old surgery. This video includes the processes from the incision stage to the final stage where sutures are placed. A total of 37 patients, 18 women and 19 men, were included in this group. The ages of the patients ranged between 18- 34 years. When their educational status is analyzed, it is seen that 24 patients are university graduates and 13 patients are high school graduates.
- **Verbal Information Group (Group 2/Control):** Patients in this group were verbally informed about the embedded 20-year-old surgery. This information is about the processes from the incision stage to the suturing stage. This group included a total of 36 patients, 17 females and 19 males. The ages of the patients ranged between 18-27 years. When their educational status is analyzed, it is seen that 26 patients are university graduates and 10 patients are high school graduates.

The Modified Dental Anxiety Scale (MDAS) and Spielberger State Anxiety Inventory Scale (STAI-S) were used to assess dental anxiety in both groups before and after the procedure. The Spielberger Trait Anxiety Inventory (STAI-T) was administered only before the procedure to determine the ongoing anxiety level of both groups (Table 1).

The MDAS consists of 5 questions on a 5-point Likert scale to measure the prospective fear and anxiety of the person. The minimum score on the MDAS is 5 (no anxiety) and the maximum score is 25 (high anxiety). In this scale, scores of 19 points and above indicate severe anxiety. The STAI-S determines how a person feels at a given moment and under certain conditions and the degree of anxiety. It is widely used to measure preoperative anxiety. The STAI-T, on the other hand, was created to determine how the person feels regardless of the situation and conditions they are in; to determine the level of anxiety that continues in general. The STAI test score can range from a minimum of 20 to a maximum of 80. A score between 20- 37 indicates no or minimal anxiety, 38-44 indicates moderate anxiety, and 45-80 indicates high anxiety.

Group	Pre-test	Experimental Procedure	Post Test
Experimental Group (Group 1)	MDAS STAI-S STAI-T	Information with Video	MDAS STAI-S
Control Group (Group 2)	MDAS STAI-S STAI-T	Verbal Information	MDAS STAI-S

Table 1

Statistical analysis

The analyses of this study were conducted using SPSS 24 (Inc. Chicago IL USA) package program. In order to decide on the parametric/nonparametric tests to be used in the study, the pretest and posttest scores of the experimental and control groups were calculated before the experimental procedure and the normality and homogeneity assumptions of the score distributions were tested. For this purpose, the skewness and kurtosis values of the pretest and posttest total scores of both groups were analyzed. If these coefficients were between -2 and +2, it was accepted that the distribution of the scores was normal [18] Levene's test was performed to test the homogeneity assumption. As a result of the test, it was accepted that the significance scores were greater than 0.05 and

therefore the assumption of homogeneity of variances was met. In cases where the assumptions of normality and homogeneity of variances were met, two-factor ANOVA method was used for mixed designs that can handle within-group, between-group and joint effects between pretest and posttests to determine the effect of the experimental procedure [17]. In cases where the assumptions were not met, it was examined whether the posttest and pretest difference scores differed according to the experimental and control groups. For this, t-test for unrelated samples was used in cases where the normality assumption was met. In addition, in order to examine whether the pretest and posttest scores of the patients in both the experimental and control groups differed, the t test for paired samples was used in cases where the normality assumption was met. In order to determine the statistical test to be used in the comparison of pretest and posttest test measurements, skewness and kurtosis values of the distributions were examined to determine whether the score distributions met the normality assumption. In cases where the normality assumption was met, ANOVA test for repeated measures was used. Descriptive statistics of the scores obtained from the STAI-T, STAI-S and MDAS scales are given in table 2.

Result

Under this heading, the findings regarding the pre-experimental procedure and the effectiveness of the experimental procedure are presented.

Findings before the experimental procedure

Within the scope of the research, the results of the unrelated sample t test applied to examine whether the pretest scores of dental anxiety, trait and state anxiety of the experimental and control groups differed are given in table 3.

T test	Group	N	Mean	df	t	p
STAI-T	Experiment	37	46,89	71	1,202	0,23
	Control	36	45,05			
STAI-S	Experiment	37	40,94	71	-,406	0,68
	Control	36	41,58			
MDAS	Experiment	37	11,62	71	-,230	0,81
	Control	36	11,83			

Table 3: t-test results of examining the differences in pretest scores of STAI TOTAL, STAI and MDAS scales according to the experimental and control groups.

When the unpaired sample t-test results in Table 3 were analyzed, it was found that the pretest scores of the STAI-T, STAI-S and MDAS scales did not show a statistically significant difference between the experimental and control groups ($p > 0.05$). In other words, the pretest scores obtained from the STAI-T, STAI-S and MDAS scales were similar between the experimental and control groups. Therefore, it can be said that the experimental and control groups had similar characteristics before the experimental procedure.

Findings on the effectiveness of the experimental procedure

Findings related to STAI-S scores

The results of the ANOVA design conducted to examine the effectiveness of the experimental procedure on the STAI-S scores of patients who underwent impacted wisdom tooth extraction surgery with video and oral information are given in table 4.

As seen in table 4, considering the group*measurement joint effect to determine the effectiveness of the experimental procedure, it was concluded that the joint effects of repeated measurement (pretest-posttest) factors on the STAI-S scores of the participants were not statistically significant, although they were in different treatment groups (Experimental-Control) ($F_{group*measurement(1-71)} = 0.0168$; $p = 0.68 > 0.05$). This finding revealed that providing video or verbal information did not make a difference in the STAI-S (state anxiety) scores of the patients.

Source of Variance	SS	Sd	MS	F	p
Between Groups					
Group (Experiment - Control)	33,752	1	33,752	,570	0,45
Error	4200,905	71	59,168		
In-groups					
Measurement (Pretest - Posttest)	64,003	1	64,003	2,798	0,09
Group* Measurement	3,839	1	3,839	,168	0,68
Error	1624,216	71	22,876		

Table 4: ANOVA analysis results for the pretest and posttest of the STAI-S scale of the Experimental and Control groups.

$p < 0,05$.

Findings related to MDAS scores

The results of the ANOVA design conducted to examine the effectiveness of the experimental procedure on the MDAS scores of patients who underwent impacted wisdom tooth extraction surgery with video and oral information within the scope of the study are given in table 5.

Source of Variance	SS	Sd	MS	F	p
Between Groups					
Group (Experiment - Control)	,019	1	,019	,001	0,97
Error	1678,036	71	23,634		
In-groups					
Measurement (Pretest - Posttest)	116,06	1	116,06	31,34	0,00
Group* Measurement	1,30	1	1,30	0,35	0,55
Error	262,94	71	3,70		

Table 5: ANOVA analysis results for the pretest and posttest of the MDAS scale of the Experimental and Control groups.

$p < 0,05$.

As seen in table 5, considering the group*measurement joint effect to determine the effectiveness of the experimental procedure, it was concluded that the joint effects of repeated measurement (pretest-posttest) factors on the MDAS scores of the participants were not statistically significant, although they were in different treatment groups (Experimental-Control) ($F_{group*measurement(1-71)} = 0.035$; $p = 0.68 > 0.05$). This finding revealed that providing video or verbal information did not make a difference in the MDAS scores of the patients.

Discussion

Two main methods are used to determine dental anxiety. The first one is direct observation of changes in the patient's behavioral and physiological reactions. The second method is the assessment of anxiety levels by means of questionnaires and standardized scales filled out individually by patients. It has been reported that filling out these scales before dental procedures does not have any negative effect on patients' fear and anxiety levels [19].

In a study by Schuurs., *et al*., six different dental anxiety and fear scales were compared and it was concluded that no single scale alone was sufficient for a comprehensive assessment. Therefore, it was suggested that more than one scale should be used together for a more accurate determination of dental anxiety [20].

Accordingly, we aimed to measure dental anxiety more comprehensively and reliably by using the MDAS, STAI-T and STAI-S scales in our study.

In our study, we evaluated the effects of visual and verbal information on dental anxiety in patients undergoing surgery for impacted third molars. Our findings are both in parallel with the existing studies in the literature and differ in certain points. In particular, the variability of the effect of video information on anxiety suggests that many factors play a role in determining the effectiveness of this method

The study by Tanidir., *et al*. reported that showing preoperative videos to patients reduced their anxiety levels. The videos used in this study explain in detail the procedure, benefits and possible risks of the surgery. They also reported that visual information techniques were more preferred by patients and increased satisfaction. The study suggests that the information creates less uncertainty on the patient and helps them better understand the surgical process [21]. Aktı., *et al*. also showed in their study that visual information (video and photographs) was more effective in reducing patients' anxiety compared to verbal information [22].

On the other hand, in a study conducted by Laskin et al., it was determined that the informed consent video shown to patients before third molar extraction negatively affected the anxiety level in approximately one third of the participants. According to the results of the study, the anxiety level decreased in only 12% of the patients, while no change was observed in 57% of the patients. The authors of this study suggested that the information given in the video about the potential risks and complications of surgery may increase anxiety in patients [23]. A similar study, a systematic review by Astramskaite., *et al*. showed that video debriefing may increase anxiety in patients and some patients may be negatively affected by this method of debriefing. This may depend on how the information content is presented and patients' individual anxiety levels. In particular, the systematic review by Astramskaite., *et al.* reported that previous negative dental treatment experiences were associated with high anxiety in patients. They suggested that such patients

may benefit more from information techniques that use more relaxing language about the process rather than detailed information [24]. Kazancıoglu., *et al*. show in their study that patients may feel more stressed after watching the informational content. Therefore, it was concluded that video content should be more reassuring and informative rather than fear-inducing [25].

Although the findings of your study show that video information does not offer a clear advantage over traditional methods, it should be kept in mind that these materials can be considered as a complementary tool for patient education. As individuals have different learning styles, some patients may benefit more from visual content. However, it is crucial that the video content is carefully selected; otherwise, the information process may increase anxiety rather than decrease it. In particular, animations or informative graphics may be more effective than actual surgical images. In addition, the use of interactive video content may help patients to manage their anxiety by allowing them to process information more actively.

Conclusion

The findings of our study show that it has significant effects in terms of patient management and clinical practices. Although no significant difference was found in this study, the development and widespread use of video-based educational materials may enable patients to actively participate in the preoperative preparation process and increase their satisfaction.

Conflict of Interest

All authors contributed significantly and equally; and all authors approved the final form of the manuscript.

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