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Impact of audiovisual information on anxiety and fear in patients undergoing dental implant treatment

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Abstract

Background: Few studies have reported the impact of audiovisual implant surgery information on anxiety and fear.

Purpose: To investigate the impact of audiovisual information on anxiety and fear in patients undergoing dental implant treatment.

Materials and Methods: This study included 300 patients due to undergo surgery to place a single implant. An interview topic guide and the Krantz Health Opinion Survey (KHOS) survey were used to assess the information patients already had about treatment and how much information they were seeking. Afterwards were randomized into two groups (n = 150): group 1 (verbal information) and group 2 (audiovisual information). Before surgery, anxiety and fear were assessed using State-Trait Anxiety Inventory (STAI), Modified Corah Dental Anxiety Scale (MDAS), and Dental Fear Scale (DFS) scales. After treatment, all patients described their satisfaction with the information received with a VAS.

Results: Before receiving information, both groups were homogenous in their knowledge of the implant procedure (P = .825) and the quantity of information sought (KHOS; P = .080). After receiving information, group 2 patients presented more anxiety and fear than group 1 (STAI-State, STAI-Treat, MDAS, DFS; P < .001). After surgery, both groups were equally satisfied with the information received and the need for additional information (P = .689; P = .199, respectively).

Conclusions: Audiovisual information generated greater anxiety and fear than conventional verbal information in patients undergoing implant surgery.

KEYWORDS

audiovisual information, dental implant treatment, verbal information

1 | INTRODUCTION

In recent years, 19% of the world's population aged over 35 years have undergone some type of treatment involving dental implants. The reduction in economic cost of implant treatments, derived from the growth of what is known as "corporate dentistry," (chains of clinics run by single entities that also offer dental insurance plans) and increasing social awareness have together contributed to the growing numbers of implants placed around the world.[1-3] Implantology has become the technique of choice to deal with the loss of a single tooth resulting from: agenesis (33% of cases), trauma avulsion (20%), endodontic complications (15%), trauma treated by extraction (9%),

periodontal disease (4%), caries (13%), extractions in the course of orthodontic treatment (2%), and impacted teeth (2%).[4,5]

In this context, research into patients' awareness of implant treatment has observed rates of 79% in Austria, 64.4% in Saudi Arabia, 64% in Australia, and 29% in Finland.[6-9] However, although patients may be aware of the existence of this type of treatment, awareness is usually accompanied by very poor knowledge of exactly what is involved in dental implant treatment.[1,10] Moreover, the information they are given generates excessively high expectations of the final outcome,[11] which may lead to dissatisfaction with the treatment received.[12] In this sense, it would be interesting to find out who supplies initial information to the patient about dental implant surgery, as this is not usually supplied by dental professionals (dentists or nurses) but by relatives or friends, printed media, or the Internet.[6,13] Fortunately, numerous research initiatives have found that patients seek more detailed information from dentists and nurses about implant treatment before undergoing surgery.[10,13]

According to the Dental Fear Survey, after receiving initial information but before receiving more detailed information from dental professionals, patients attend the dental clinic with some level of anxiety about the dental treatment they are to receive, which affects between two thirds and three quarters of the population. In this way, 76.6% of the Japanese population were found to suffer anxiety when attending the clinic, 75% in the USA, 65.5% in Indonesia, 65.7% in Brazil, 30% in Norway, 16.1% in Australia, 11% in Britain, and 6.7% in Sweden.[14-20] In addition, it should be noted that numerous studies have observed that treatments involving oral surgery generate even higher levels of anxiety and fear.[21-23]

In this context, the detailed information about implant treatment imparted to the patient by dental professionals can have the effect of heightening patient anxiety and fear.[24] Traditionally, the terms fear and anxiety mean different things, the former constituting an immediate emotional reaction to a real identifiable danger, while the second is a more diffuse emotional state without a recognizable external source. In other words, it does not vary in direct proportion to the real (objective) threat of danger. But in reality, it is difficult to completely isolate fear from anxiety, as one does not occur without some degree of the other.[25]

When dental professionals provide detailed information about implant-based treatments to patients, three basic factors may influence the level of fear and anxiety experienced by the patient: the quantity of information demanded by the patient, how much information the dental professional chooses to supply, and how that information is transmitted.[26,27] With regard to the quantity of information demanded by the patient, it would appear that those patients who demand more information in advance suffer less anxiety,[28,29] while those who demand less present greater anxiety.[30,31] As for the amount of information we give the patient, there is a great deal of controversy over the extent and conceptual background that should be included, whereby some authors believe that a greater amount of information will reduce anxiety before surgeries including oral biopsy, impacted lower third molar extraction, and implant placement,[23,27] while others believe that a large quantity of information will increase anxiety in a patient who is about to undergo dental implant surgery.[24] The third factor affecting levels of anxiety and fear is the way in which information is transmitted. In recent years, the use of audiovisual material has become more widespread in dental clinics. This may take the form of an animated "demo" video using computer-generated graphics, often supplied by implant manufacturer's for use in clinical settings, or videos of real cases posted on the Internet (mainly on YouTube),[32,33] or even videos of real cases treated at the clinic the patient is attending.[24] But, while recent research has shown that video-based information can save time and improve the quality of information about other pathologies,[34-37] the fact that dental implant placement is a relatively simple procedure for the dentist, but appears complex to the patient, may mean that replacing conventional face-to-face verbal transmission with videos of real cases in fact increases fear and anxiety among patients undergoing implant-based treatment.

Although dental clinics are introducing new technologies for imparting information to patients who are to undergo dental implant surgery, there is a lack of awareness that video material of the actual surgical procedures involved can increase patient fear and anxiety. To date, only one scientific article has been published that has compared the use of informational videos and transmission by conventional face-to-face verbal information.[24]

At present the use of audiovisual information in dental clinics for imparting information to patients, can improve the level of patient knowledge about dental implant treatment. Nevertheless, is possible that this video-assisted patient education can increase the anxiety and fear in patients undergoing dental implant treatment. In this sense, the aim of this study was to investigate the impact of audiovisual information on anxiety and fear in patients undergoing dental implant treatment, comparing the use of video with conventional verbal information.

2 | MATERIALS AND METHODS

2.1 | Recruitment and patient characteristics

The study protocol was approved by the University of Murcia Ethics Committee (Spain) (2277/2019) and followed guidelines established by the declaration of Helsinki for research involving human subjects. The study was carried out between November 2018 and April 2019 at two centers: The University Dental Clinic (University of Murcia, Murcia, Spain) and a private dental clinic. Inclusion criteria were as follows: patients aged over 18 years, requiring a single dental implant, absence of medical contraindications for oral surgical procedures (ASA I/II), patient willing to provide informed consent to take part in the study. Exclusion criteria were: presence of some disease, condition, or medication that could compromise healing or osteointegration (diabetes mellitus, bisphosphonate administration, or severe osteoporosis); presence of severe mental disorder; patients who had received radiotherapy of the head and neck during the previous 18 months; patients whose negative experiences about the procedure could cause higher anxiety levels; patients with a bad dental treatment history.

None of the patients who fulfilled the inclusion criteria and were consecutively invited to take part in the trial refused. The total sample included 300 patients (Figure 1).

2.2 | Patient interview topic guide

All patients (n = 300) responded to an interview topic guide to determine the information patients already had about the implant treatment they were to undergo. This interview topic guide was a modified version of the interview used by Kashbour et al,[13] in 2018 and consists of seven questions. The first (How much do you know about the implant treatment process?) was answered via a 10-cm-long visual analogue scale (VAS) on which 0 mm indicated a complete lack of knowledge about the implant treatment process and 100 mm full knowledge about treatment. The other six questions (What was your initial source of implant treatment information? Which source of implant information do you think is more trusted/clear? Do you think that the different sources of implant treatment information are trusted? Do you think that implant treatment is suitable to your dental condition? Do you think that in implant treatment information, the new information technologies must be used? Which is your area of implant treatment knowledge gap?) were answered qualitatively selecting one of a range of answers: for the first and second questions (friends, dentist or

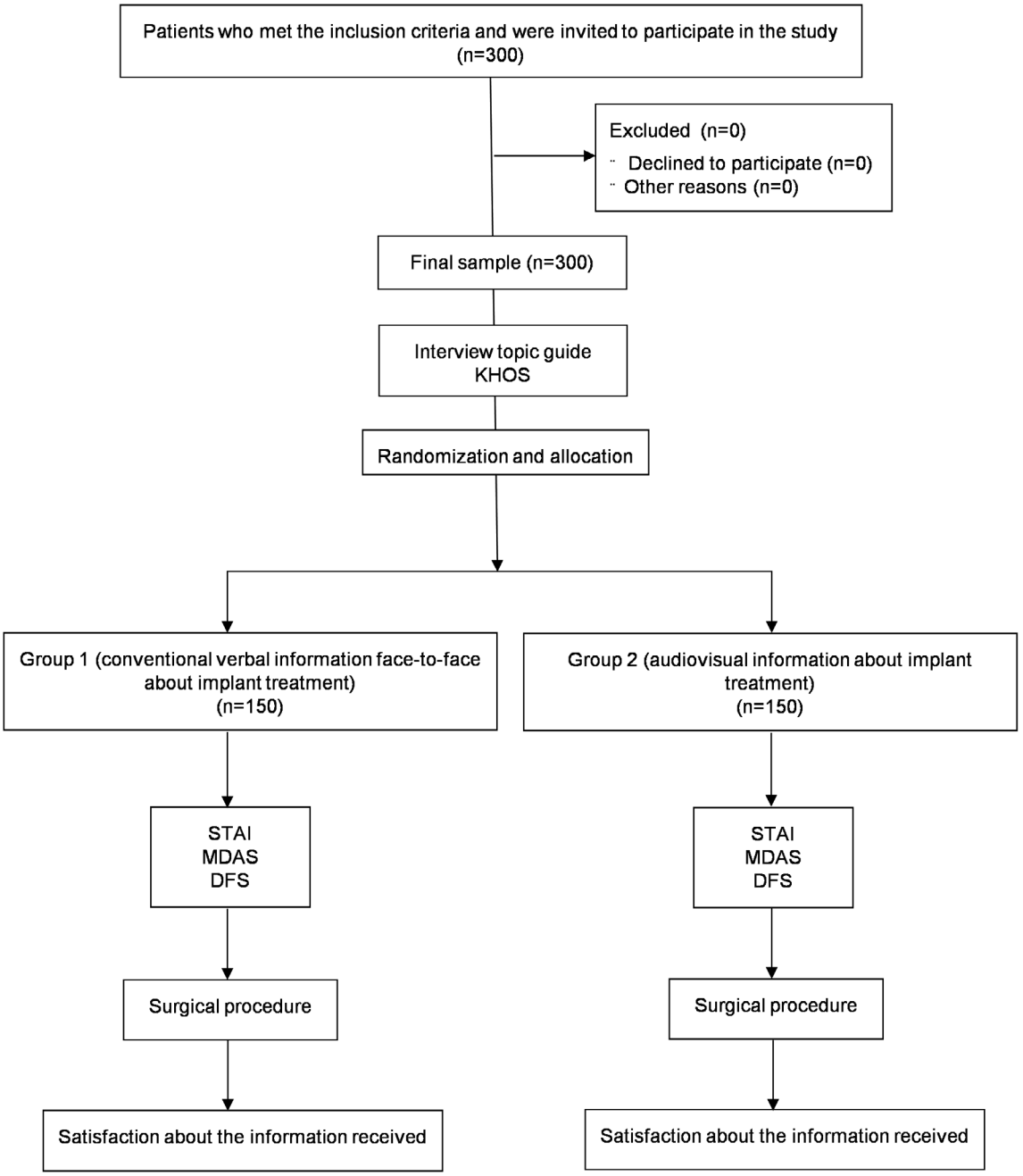

FIGURE 1 Patient flow diagram

nurse, divulgation media, or Internet); for the third, fourth, and fifth (yes or no); and for the sixth (surgery, prosthesis, both, or none).

2.3 | Krantz Health Opinion Survey

The KHOS[38] was completed by the entire patient sample (n = 300) before randomization to determine how much information patients sought about health care (preferences in making decisions about health care). It has two subscales: "preference for information subscale" with seven items, and "behavioral involvement subscale" with nine items. The first subscale reflects the tendency of patients to seek health-related information actively, and to participate in making treatment-related decisions. The second subscale was designed to assess patient's preferences for the degree of control or involvement in their own care. Both subscales use a binary response format, with agree (n = 1) or disagree (n = 0). The total maximum score is 16 points: 7 in "preference for information subscale" and 9 in "behavioral involvement subscale." High scores indicate strong preferences for information, or behavioral control, or both. Cronbach's α was high in this study, 0.82 for "preference for information subscale" and 0.84 for "behavioral involvement subscale."

2.4 | Study groups

The patients were randomized into two groups (n = 150 per group) using the online service www.randomization.com.

Group 1 (conventional face-to-face verbal information about implant treatment): the dentist imparted detailed information to the patient verbally and face-to-face about the single dental implant surgical procedure. So that the information was always imparted in a way that was homogenous and reproducible, the dentist used a prepared text of 192 words (providing her/him with the option of reading the information if she/he was unable to remember the exact information, while not making it obvious that she/he was giving identical information to every patient) explaining how the single implant surgical procedure is carried out (from the local anesthesia until suture).

Group 2 (audiovisual information about implant treatment): information about the single implant surgical procedure was not imparted verbally but by means of a video shown on an iPad tablet (Apple Inc., California). The video lasted 1.39 min and provided the same information as that imparted verbally to group 1 patients (via a voice-over of the same 192-word text used for group 1 explaining how the single implant surgical procedure is carried out, from the local anesthesia until suture), accompanied by a video of a real surgical procedure performed at the University Dental Clinic (University of Murcia, Murcia, Spain).

After providing all patients with this information, fear and anxiety generated by the two information methods, were assessed using Spielberger's State-Trait Anxiety Inventory (STAI), the Modified Corah Dental Anxiety Scale (MDAS), and the Kleinknecht Dental Fear Scale (DFS).

2.5 | STAI

The STAI has 40 items, 20 items allocated to each of the STAI-State and STAI-Trait subscales. Each statement in the STAI-State or STAI-Trait is rated on a 4-point scale according to the patient's agreement with that statement: not at all (n = 1), somewhat (n = 2), moderately so (n = 3), or very much so (n = 4). The overall scores for STAI-State or STAI-Trait ranges from a minimum of 20 to a maximum of 80.[39,40]

2.6 | MDAS

The MDAS is a questionnaire designed specially to measure anticipatory anxiety. It is made up of five questions with a choice of single-selection responses, whereby the subject chooses the response closest to her or his feelings. Scores range between 5 (no anxiety) and 25 (maximum anxiety); the lower threshold for marking subjects with extreme anxiety is 19.[41,42]

2.7 | DFS

The DFS consists of 20 items grouped into three dimensions: the avoidance of dentistry, physiological arousal during dental appointment, and various items of dental stimuli, according to which a patient's dental anxiety is assessed on a Likert scale of intensity ranging from 1 (no fear) to 5 (extreme fear). The overall score for DFS ranges from 20 (no fear) to 100 (extreme fear).[14]

2.8 | Surgical procedure

A total of 300 single dental implants were placed in this study. Each patient received one Galimplant dental implant (Galimplant S.L., Sarria, Spain) under local anesthesia (articaine with 0.5% epinephrine), raising a mucoperiosteal flap. The implants were placed following the recommendations of the dental implant system manufacturer (following the recommended drilling sequence at the recommended speeds). Lastly, the mucoperiosteal flap was sutured with simple sutures of 4/0 nonabsorbable polyamide suture, neither provisionalization crowns were placed. In all cases, the postoperative medication prescribed was amoxicillin 500 mg every 8 hours for 7 days (in cases of penicillin allergy, 300 mg clindamycin was prescribed every 8 hours) and ibuprofen 600 mg every 8 hours for 3 days.

2.9 | Satisfaction with the information received

After implant surgery, each patient responded via a 100 mm long VAS to two statements: "I am satisfied with the information received" (0 mm indicating complete dissatisfaction and 100 mm full satisfaction with the information received), and "I would have liked to receive more information" (0 mm indicating that they would not have liked to receive more information and 100 mm indicating that they would have liked to receive much more information).

2.10 | Statistical analysis

Data were analyzed using the SPSS version 20.0 statistical package (SPSS Inc., Chicago, Illinois). A descriptive study was made of each variable. Associations between different qualitative variables were analyzed using Pearson's chi-squared test. Student's *t* test for two independent samples was applied to quantitative variables, in each case determining whether variances were homogeneous. The reproducibility of the KHOS was evaluated using Cronbach's α. Statistical significance was established as $P \leq .05$.

3 | RESULTS

This study recruited 300 patients (149 men and 151 women), with an average age of 45.91 ± 15.64 years. The sample was divided into two groups of 150 patients each: group 1 (conventional verbal information face-to-face about implant treatment), and group 2 (audiovisual information about implant treatment). When the two groups were compared, they were found to be homogenous in terms of age, sex, education level, smoking, alcohol consumption, and toothbrushing (Table 1).

TABLE 1 Comparison of study groups' demographic characteristics, education level, and habits (Student's *t* test and Pearson χ^2)

Characteristics	Verbal information (n = 150)	Audiovisual information (n = 150)	*P*-value
Age: mean ± SD	45.85 ± 12.66	45.97 ± 18.19	.950
Sex: n (%)			.908
Male	74 (49.33)	75 (50.00)	
Female	76 (50.67)	75 (50.00)	
Education level: n (%)			.931
None	18 (12.00)	20 (13.33)	
Primary	30 (20.00)	32 (21.33)	
Secondary	52 (34.67)	53 (35.34)	
Higher education	50 (33.33)	45 (30.00)	
Smoking behavior: n (%)			.865
Nonsmoker	81 (54.00)	74 (49.33)	
≤10	45 (30.00)	48 (32.00)	
11-20	20 (13.33)	23 (15.33)	
>20	4 (2.67)	5 (3.34)	
Alcohol consumption: n (%)			.904
None	110 (73.33)	109 (72.67)	
Daily	4 (2.67)	3 (2.00)	
Weekend drinker	36 (24.00)	38 (25.33)	
Toothbrushing: n (%)			.923
1/day	15 (10.00)	16 (10.67)	
2/day	44 (29.33)	41 (27.33)	
≥3/day	91 (60.67)	93 (62.00)	

TABLE 2 Comparison between groups in relation to patients' initial information about implant treatment (interview topic guide), before receiving information imparted in the course of this study (Student's *t* test and Pearson χ^2)

Interview topic guide	Verbal information (n = 150)	Audiovisual information (n = 150)	*P*-value
How far do you know about the implant treatment process? (VAS): mean ± SD	57.07 ± 15.86	56.57 ± 22.57	.825
What was your initial source of implant treatment information?: *n* (%)			.564
Friends	16 (10.67)	20 (13.33)	
Dentist or nurse	78 (52.00)	74 (49.33)	
Divulgation media	8 (5.33)	4 (2.67)	
Internet	48 (32.00)	52 (34.67)	
Which source of implant information do you think is more trusted/clear?: *n* (%)			.800
Friends	2 (1.33)	4 (2.67)	
Dentist or nurse	143 (95.34)	142 (94.66)	
Divulgation media	2 (1.33)	1 (0.67)	
Internet	3 (2.00)	3 (2.00)	
Do you think that the different sources of implant treatment information are trusted?: *n* (%)			.876
Yes	24 (16.00)	25 (16.67)	
No	126 (84.00)	125 (83.33)	
Do you think that the implant treatment is suitable to your dental condition?: *n* (%)			.652
Yes	148 (98.67)	147 (98.00)	
No	2 (1.33)	3 (2.00)	
Do you think that in implant treatment information, the new information technologies must be used?: *n* (%)			.296
Yes	135 (90.00)	140 (93.33)	
No	15 (10.00)	10 (6.67)	
Which is your area of implant treatment knowledge gap?: *n* (%)			.460
Surgery	10 (6.67)	10 (6.67)	
Prosthesis	15 (10.00)	8 (5.33)	
Both	122 (81.33)	130 (86.67)	
None	3 (2.00)	2 (1.33)	

TABLE 3 Comparison between groups in relation to information sought, before receiving information imparted in the course of this study (Student's *t* test)

Preferences in health care decisions	Verbal information (n = 150)	Audiovisual information (n = 150)	*P*-value
KHOS (the complete instrument): mean ± SD	10.66 ± 0.99	10.47 ± 0.91	.080
KHOS-I (preference for information scale)	4.11 ± 0.65	4.01 ± 0.57	.193
KHOS-B (behavioral involvement scale)	6.56 ± 0.78	6.45 ± 0.76	.233

TABLE 4 Comparison between groups of anxiety generated after receiving information imparted before implant surgery (Student's *t* test)

Anxiety	Verbal information (n = 150)	Audiovisual information (n = 150)	*P*-value
STAI: mean ± SD			
STAI-State	52.13 ± 6.71	72.53 ± 5.98	<.001
STAI-Trait	49.07 ± 7.05	69.10 ± 4.18	<.001
MDAS: mean ± SD	17.38 ± 3.53	22.03 ± 2.71	<.001

TABLE 5 Comparison between groups in relation to fear generated after receiving information before implant surgery (Student's *t* test)

Fear	Verbal information (n = 150)	Audiovisual information (n = 150)	*P*-value
DFS: mean ± SD	63.66 ± 12.41	84.35 ± 9.67	<.001

When the quantity of information patients had about dental implant treatment, and how much information they sought were assessed (before receiving the detailed information via the two methods compared in the study), the groups were found to be homogenous in their levels of knowledge about the implant treatment process (group 1, 57.07 ± 15.86; group 2, 56.57 ± 22.57, $P = .825$) and in the amount of information they would seek (KHOS complete instrument: group 1, 10.66 ± 0.99; group 2, 10.47 ± 0.91, $P = .080$; KHOS-I: group 1, 4.11 ± 0.65; group 2, 4.01 ± 0.57, $P = .193$; KHOS-B: group 1, 6.56 ± 0.78; group 2, 6.45 ± 0.76, $P = .233$). In addition, the interview topic guide showed that both groups were homogenous in terms of: the initial source of implant treatment information ($P = .564$); the initial source considered more trusted/clear ($P = .800$); and the area of implant treatment knowledge gap ($P = .460$). In relation to the source of information about dental treatment and how it is imparted, in the present study, 36 of the 300 patients (12%) had received initial information from friends, 152 of the 300 patients (50.67%) from dentists or nurses, 12 of 300 patients (4%) from divulgation media, and 100 of 300 patients (33.33%) from Internet (Tables 2 and 3).

TABLE 6 Implant distribution

Characteristics	Total (n = 300) n (%)	Verbal information (n = 150) n (%)	Audiovisual information (n = 150) n (%)
Maxilla/mandible			
Maxilla	220 (73.33)	146 (97.33)	74 (49.33)
Mandible	80 (26.67)	4 (2.67)	76 (50.67)
Anterior/posterior			
Anterior	71 (23.67)	48 (32.00)	23 (15.33)
Posterior	229 (76.33)	102 (68.00)	127 (84.67)
Length			
10 mm	113 (37.67)	59 (39.33)	54 (36.00)
12 mm	150 (50.00)	70 (46.67)	80 (53.33)
14 mm	37 (12.33)	21 (14.00)	16 (10.67)
Diameter			
3.50 mm^2	59 (19.67)	22 (14.67)	37 (24.67)
4.00 mm^2	148 (49.33)	80 (53.33)	68 (45.33)
4.50 mm^2	93 (31.00)	48 (32.00)	45 (30.00)
Site			
1.3	48 (16.00)	48 (32.00)	0 (0)
1.4	119 (39.67)	72 (48.00)	47 (32.67)
1.5	6 (2.00)	6 (4.00)	0 (0)
1.6	4 (1.33)	0 (0)	4 (1.33)
2.3	23 (7.67)	0 (0)	23 (15.33)
2.4	20 (6.67)	20 (13.33)	0 (0)
3.5	4 (1.33)	0 (0)	4 (2.67)
3.6	24 (8.00)	0 (0)	24 (16.00)
4.5	24 (8.00)	0 (0)	24 (16.00)
4.6	28 (9.33)	4 (2.67)	24 (16.00)

TABLE 7 Comparison between groups in relation to satisfaction, after completing surgery, with information received (Student's *t* test)

Satisfaction	Verbal information (n = 150)	Audiovisual information (n = 150)	*P*-value
I am satisfied with the information received (VAS): mean ± SD	73.20 ± 19.50	74.00 ± 14.72	.689I
would have liked to receive more information (VAS): mean ± SD	23.53 ± 9.21	21.97 ± 11.72	.199

After receiving information verbally or via video, group 2 (audiovisual information) showed greater anxiety evaluated by means of the STAI, than group 1 patients (verbal information), with statistically significant difference for both the STAI-State ($P < .001$)

and the STAI-Trait ($P < .001$). In the same way, group 2 patients also presented greater anxiety when assessed by means of the MDAS, with statistically significant difference ($P < .001$) (Table 4).

When patients' fear was measured (after receiving information imparted in the study) by means of the DFS, again group 2 patients (audiovisual information) presented greater fear with statistically significant difference ($P < .001$) (Table 5).

The distribution of the single dental implants placed is shown in Table 6, maxillary placement being more frequent (73.33%), and placement more frequent in posterior regions (76.33%).

After completing implant treatment, both groups were equally satisfied with the information received (group 1 verbal information 73.20 ± 19.50; group 2 audiovisual information 74.00 ± 14.72, $P = .689$), and with the need for additional information (group 1 verbal information 23.53 ± 9.21; group 2 audiovisual information 21.97 ± 11.72, $P = .199$) (Table 7).

4 | DISCUSSION

In the literature, it is common to speak of dental anxiety as being endogenous or exogenous. In 1989, Weiner[43] claimed that the former has to do with the individual's personality, is innate, unalterable, constitutional, defined as the individual subject's predisposition to perceive situations as potentially threatening, which makes this dental patient vulnerable to general anxiety, mood swings, and inclined to suffer multiple and diverse fears. Exogenous anxiety is the outcome of conditioning and experience, whether resulting directly from dental treatment received previously, or indirectly via the information the patient receives before dental treatment, regardless of the source. At the same time, dental fear has been defined as a manifestation of fear in general, an emotional disturbance, distress, when faced with a situation that may be real or imaginary.[44] In 1954, Schoben & Borland[45] in an empirical study of the etiology of dental fear, stated that dental fear was an acquired feeling rather than innate. In this sense, in the field of oral surgery,[46,47]and more specifically in implant dentistry,[48] it is important to be aware of the initial information the patient receives, as well as the quantity of information, and the medium through which it is transmitted by dental professionals, as both factors may influence both exogenous anxiety and acquired fear.[6,13,49]

In relation to the source of information about dental treatment and how it is imparted, in the present study, 36 of the 300 patients (12%) had received initial information from friends. Pommer et al,[6] in a study of 1000 Austrian patients, found that 30% of the simple had obtained primary information via friends and acquaintances. Meanwhile, Al-Dwari et al,[49] surveyed a sample of 300 Jordanian patients, finding that 63.4% had received information about dental treatments from relatives and friends. But other authors, such as Kashbour et al,[13] have argued that the information imparted by relatives or friends, even though it provides the patients with some prior knowledge of dental implant treatment, can also generate excessive expectations of the outcomes. For this reason, many patients resort to new sources of information such as social media, the Internet, and especially YouTube to access more complete information, in particular audiovisual information.[33] So, in the present study, 100 of the 300 patients (33.33%) had used the Internet as an initial source of information about implant treatment. Perhaps this high percentage of patients making use of the Internet was due to the age of the sample (45.91 ± 15.64), making this a predominantly middle-aged population, and to its high educational level (105 out of 300 subjects had completed secondary education [35%] and 95 had completed higher education [31.67%]), while in the study by Al-Dwari et al,[49] only 1.4% of the 300 patients had used the Internet as an initial source of information about implant treatments, but in their sample 21.7% of the patients were aged between 60 and 69 years, and 7% were aged over 70 years. Moreover, the educational level of the subjects was much lower than in the present study. Similarly, Al-Johany et al,[50] in a study of 379 patients in Saudi Arabia, reported that the use of the Internet to obtain initial information about dental implants was less frequent among patients with lower educational levels and more frequent among the young and middle-aged, with higher educational levels. However, videos available on the Internet about implant treatments not only increase patients' expectations but also can increase anxiety and fear of implant surgery. With regard to patients' increased expectations of dental implant-based treatments, Wang et al,[32] published a qualitative study that set out to evaluate the public's information acquisition and perceptions of dental implants and the effects of these on their care-seeking and decision making; it was concluded that patients tend to over-estimate the function and longevity of dental implants. In the same way, in a systematic search of YouTube videos containing information on dental implants using the key search terms “dental implant” and “tooth replacement” conducted in 2018, Abukaraky et al,[33] concluded that the information about dental implants available on YouTube is limited in quality and quantity. Nevertheless, such videos can play a potentially important role in modulating patients' attitude and treatment decisions about dental implant-based treatments.

In relation to the increased fear of implant surgery, several studies have shown that audiovisual information can augment patients' fear and anxiety during this initial phase of receiving information about such treatments.[51]

The second factor that may influence both exogenous anxiety and acquired fear of dental treatment, is the way in which information is imparted by dental professionals, the latter being a very important factor, even more so than the initial information received, as, regardless of the source of primary information about implant treatments (friends, relatives, printed matter, social networks, Internet, the mass media), numerous studies agree that at later stages patients seek more detailed information from both dentists and dental nurses.[10,13]

As a consequence of the introduction of new technologies in dental clinics used to impart information, it is important to be aware that the use of video footage of real implant surgery may affect patient levels of anxiety and fear. In the present study, patients who received audiovisual information about implant treatment showed greater anxiety and fear than patients who received conventional face-to-face

verbal information, with statistically significant difference ($P < .001$ with the STAI-State, STAI-Treat, MDAS, and DFS).

One of the main limitations that the present study suffered was the difficulty of comparing the results with other scientific literature, due to the scarcity of published research on this topic. Only one work by Kazancioglu et al,[24] has made use of videos imparting information about dental implant treatment to determine their effect on patients' anxiety; the study also supplied information verbally face-to-face. A total of 60 patients were randomized into three groups, each containing 20 patients: group 1, basic information given verbally, with details of surgery and recovery; group 2, (study group) basic information given verbally with details of surgical procedures and recovery, and by watching a movie on single implant treatment; group 3, (control group) basic information given verbally "but devoid of details of surgical procedures and recovery." Anxiety levels were assessed using STAI and MDAS. The results were similar to the present study with higher values obtained in both the STAI and the MDAS in the movie group, with statistically significant difference, concluding that preoperative multimedia information increases anxiety levels. Another of the limitations of our study is that we have not evaluated if the site of the implant may influence in anxiety and fear. In this sense, we consider that this topic is relevant to future researches.

It is possible that the increase in fear and anxiety among patients receiving information audiovisually is due to the characteristics inherent to audiovisual language. This is characterized by multisensorial communication (visual and auditory), in which visual content tends to dominate verbal narration, mobilizing patients' sensitivity, and transmitting far more stimuli than verbal communication alone. In this sense, although several studies have concluded that the use of videos for imparting information to patients can reduce anxiety and fear and increase patient comprehension prior to general anesthesia[52] or knee arthroscopy,[53] studies related to other oral surgical procedures such as Kazancioglu et al,[47] report increases in anxiety levels. In this study, a total of 333 patients were to undergo third molar surgery. They were randomized into three groups: two study groups (group 1, basic information given verbally; group 2 [studygroup], basic information given verbally and via a movie on third molar extraction; Control Group, basic information given verbally, which did not include information on operative procedures and recovery). Anxiety levels were assessed by the DAS and STAI, finding that preoperative multimedia information increases anxiety among patients undergoing third molar surgery. The possible explanation about why the use of video is positive in other surgeries and not in oral surgery may be the nature of oral surgery with sound and vibration instruments, or the possibility of seeing and hearing the irrigation or bur vibration. In this sense, we consider that this topic is relevant to future researches.

In the present study, when dental implant placement surgery had been completed, both groups reported equal satisfaction with the information received a priori, and with the need for additional information ($P = .689$ and $P = .199$, respectively), which shows that patients receiving face-to-face verbal information were equally satisfied with the information received and did not require further, more detailed information, and that this means of imparting information did not increase their fear and anxiety before undergoing surgery. In this sense, Cabbar et al,[23] conducted a study to determine whether supplying more information would reduce anxiety in patients undergoing lower third molar surgery or implant surgery. To do this, one group received conventional face-to-face verbal information, and the other more detailed information in writing. They found that the patients who received written information did not report lower anxiety.

5 | CONCLUSIONS

In conclusion, audiovisual information generates higher levels of anxiety and fear than conventional face-to-face verbal information in patients undergoing dental implant treatment. Further clinical studies should be conducted to confirm the present findings, and as the results depend on surveys, scales, and questionnaires used; these further clinical studies must use standardized procedures.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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