ORIGINAL ARTICLE

A randomized control trial comparing the visual and verbal communication methods for reducing fear and anxiety during tooth extraction

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Abstract *Purpose:* To evaluate the value of using the visual information for reducing the level of dental fear and anxiety in patients undergoing teeth extraction under LA.

Methods: A total of 64 patients were indiscriminately allotted to solitary of the study groups following reading the information sheet and signing the formal consent. If patient was in the control group, only verbal information and routine warnings were provided. If patient was in the study group, tooth extraction video was showed. The level of dental fear and anxiety was detailed by the patients on customary 100 mm visual analog scales (VAS), with "no dental fear and anxiety" (0 mm) and "severe dental distress and unease" (100 mm). Evaluation of dental apprehension and fretfulness was made pre-operatively, following visual/verbal information and post-extraction.

Results: There was a substantial variance among the mean dental fear and anxiety scores for both groups post-extraction (*p*-value < 0.05). Patients in tooth extraction video group were more comfortable after dental extraction than verbal information and routine warning group. For tooth extraction video group there were major decreases in dental distress and anxiety scores between the

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pre-operative and either post video information scores or postoperative scores (*p*-values < 0.05). Younger patients recorded higher dental fear and anxiety scores than older ones (*P* < 0.05).

Conclusion: Dental fear and anxiety associated with dental extractions under local anesthesia can be reduced by showing a tooth extraction video to the patients preoperatively.

1. Introduction

The fear and anxiety for dental examination or treatment is natural for many patients (Al-Samadani and Gazal, 2015; Gazal et al., 2015). Dental practitioners over last two decades tried different modalities to reduce dental fear and anxiety on dental chair. These approaches include noninvasive procedures such as listening to music and application of topical local anesthetics (Thoma et al., 2015). Postoperative distress associated with dental extractions under local anesthesia was reduced by the application of topical anesthetic (20% benzocaine) at the site of injection (Al-Samadani and Gazal, 2015). The utilization of medications to control the pain and anxiety is the conventional modality (Gazal et al., 2014). The systems of inhalation, intravenous, intramuscular and oral sedation have been taught for a long time in dental schools, through proceeding training channels. It has been accepted that the pharmacological sedation does not decrease or wipe out the fear; it incidentally dodges it (Nelson and Xu, 2015; Coulthard et al., 2015). Its quality is based fundamentally on making dental procedures congenial for the patients by reducing anxiety and processing a provisional state of tranquility (Gazal and Mackie, 2007). The issue is not only related to the patient only but also to the escorts and dental team. It is evident that both the specialist and the patient, apprehension must be seen as a dilemma obliging treatment. One might say, each one time the dental specialist is confronted with an apprehensive patient, he is managing a crisis; not a dental emergency; however the crisis of apprehension for the dental practitioner confronting the fearful patient may result in a feeling of insufficiency and dissatisfaction unless he is outfitted to manage the issue expertly (McCarthy, 1979; Appukuttan et al., 2015).

Pain and distress following teeth extraction under LA is still perceived as usually being suboptimal (Goddard and Pickup, 1996; Rudin et al., 2010; Taneja et al., 2015). On dental chair patients who have high level of anxiety and fear show a decrease in pain threshold. Consequently they will need more local anesthetics in order to carry out the treatment. Scared and anxious patients also avoid the attendance of the regular and emergency dental appointments resulting in poor oral health (Hmud and Walsh, 2009). The physical environment can play a critical role in maneuvering dental apprehension. A few on edge patients react well to more clear distraction systems, for example, listening to music or viewing films throughout treatment. Heaton et al. (2013) reported that the usage of computer assisted relaxation learning for patients with dental needle phobia resulted in reducing fear of dental injections. A recent study (Al-Namankany et al., 2015) investigated the effectiveness of video modeling for reducing the level of dental anxiety related to the using of nasal mask for children receiving dental treatment under inhalation sedation. Their findings revealed that the video modeling did reduce the dental anxiety and has a significant impact on the acceptance of the nasal mask administration for inhalation sedation in children.

Considering these facts, this research was designed to reduce the level of fear and anxiety in the patients who will have teeth extraction under local anesthesia (LA). It was hypothesized that a constructive impact on the level of fear and apprehension cab be obtained using a recorded video clip for the process of dental extraction preoperatively. To the best of our knowledge, no published study has reported the effects of using a recorded video clip showing the process of dental extraction as an educating technique. The current study has formally considered this comparison as a potential valuable trail for reducing the level of fear and anxiety in adult patients who are going to have teeth extraction under LA. The major aim of this study was to assess the level of dental fear and uneasiness in patients undergoing teeth extraction under LA. In addition, the effects of verbal communication and administration of video clip were compared.

2. Material and methods

This study was a single blind randomized clinical trial that was conducted at the department of oral and maxillofacial surgery, Taibah University College of Dentistry Almadinah Almunawwarah. The study was approved by the Taibah University Dental College research ethics committee. The patients attending the oral surgery and maxillofacial department from March 2014 to May 2014 for the purpose of tooth extraction were screened for detailed history and oral examination and necessary radiographs. Majority of teeth were extracted due to gross caries (23 patients; %39.7); caries with dental abscess 24 (% 41.4) followed by periodontal diseases (10 patients; %17.2) and orthodontic reasons (1 patient; %1.7) had treatment. 64 patients who fulfilled the following criteria were eligible for inclusion into the study: (1) Male aged 17–60 years of age. (2) Scheduled for simple extraction of between 1–3 teeth. (3) ASA I or II patients (American Society of Anesthesiologist). (4) Where the patient was able to understand and co-operate with the requirements of the protocol and was able and willing to exercise an appropriate written informed consent. Patients were excluded from the study if they need more than three teeth extraction, surgical extractions, nonadjacent multiple teeth extraction, were too distressed or upset to be approached and have language barriers.

All patients were assigned a reference number and divided into two study groups. For group 1 or the control group, all patients were given routine verbal information and routine warnings regarding the process of tooth extraction while waiting before starting the procedure. All verbal information was standardized and presented by the same dental surgeon. For group 2, all patients were provided the same information using a short video clip while waiting before starting the procedure. The video clips showed a dental surgeon welcoming a patient using friendly words, giving information about the dental injection and the extraction, reassuring the patient to relax and breathe deeply while LA is administrated. If a patient experiences pain at any point of procedure, he was asked to raise his hand for providing him with extra LA. Moreover, free pain extraction was carried out and post-extraction instruction was provided. All other surrounding conditions such as environment, waiting time, staff interaction etc. were kept similar for all patients. The principle researcher randomly distributed the patient identity numbers to each group and secured in opaque sealed envelopes. This was carried out by a secretary who was not connected with the study. These envelopes had been numbered successively on their outside with the patient identity number.

The levels of anxiety were recorded by the patients on standard 100 mm visual analog scales (VAS), tagged at the endpoints with "no anxiety" (0 mm) and "severe anxiety" (100 mm). These assessments were recorded at three stages for each patient; (1) pre-operatively, (2) after verbal information or recorded video and (3) postoperatively. Patients who recorded high anxiety scores were asked for the underlying causes of their fright. VAS is a well accepted approach (Facco et al., 2013, 2011; Pritchard, 2010; Williams et al., 2010). The data scrutiny was performed using computerized package (SPSS version 20) and appropriate statistical tests (paired t-test) were used for statistical data analysis.

Power calculation: sample size calculation was made for this study based on a study by Kareem et al. (2012). A sample size of 26 in each group would have 90% power to detect a difference in means of 0.173 for cortisol concentration in saliva which positively correlates with the patient's level of stress.

3. Results

As a result of the patient's medical screening in the dental office, 4 patients were excluded for not fulfilling the inclusion criteria patients needed surgical extractions (2 patients), refused to give consent (1 patient), and language barrier (1 patient). Two patients were excluded as their data remained incomplete; hence results are based on data obtained from 58 patients (29 patients in each group).

There were no significant differences between the mean dental fear and anxiety scores for both groups preoperatively. However a significant difference ($p = 0.01$) was observed between both groups postoperatively (Fig. 1). The VAS anxiety level was around 50 for both groups preoperatively and remains the same after verbal instructions for group 1 however drops down remarkably for group 2
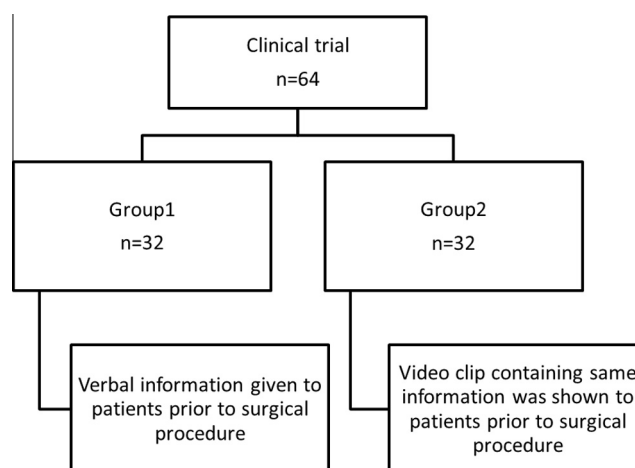

Figure 1   Description of Study design and study groups.

(mean = 25.4). In postoperative assessment, VAS score was insignificantly reduced (mean = 38.8) however a significant reduction (mean = 9.1) was reported in group 2 (Fig. 1). The effects of communication methods in controlling postoperative anxiety are shown in Fig. 2. The group 1 patients exhibited VAS level distribution 0–80 compared to group 2 showing VAS level distribution 0–50 (Fig. 2). The postoperative anxiety level of 10 or less was observed in 25 (86%) groups 2 patient and 15 (52%) in group 1 patients. Complete distribution of ASA anxiety score for group 1 and group 2 is shown in Fig. 2.

For both tooth extraction video and verbal information and routine warnings groups, changes in dental fear and anxiety scores from the preoperative score to the post-video/verbal information score and to the post-operative were made using the paired sample t-test. There was no difference for verbal information and routine warning group when comparing the pre-operative score with the post verbal information score or postoperative score (p-values: 0.65, 0.09). However for tooth extraction video group there were significant decreases in dental fear and anxiety scores between the pre-operative and either post video information scores or postoperative scores (p-values: 0.002, < 0.001) (see Fig. 3).

The preoperative and postoperative anxiety levels were compared considering different age groups and number of teeth being extracted (Table 1). Patients were divided into two age groups [17–29 years and 30–60 years] and teeth being extracted [either one or more than one]. In younger group (17–29 years), anxiety scores were 40.7 ± 21.9, 30.0 ± 28.1 and 21.1 ± 25.4 for preoperatively, following instructions and postoperatively respectively. In the second group (30–60 years) the anxiety levels observed were reduced for each stage to 30.5 ± 17.7, 22.8 ± 16.2 and 8.0 ± 11.6 respectively for preoperative, following instructions and postoperative phases (Table 1). The provision of t-test uncovered that there were no huge contrasts in the anxiety scores between the two age groups ($p > 0.05$) for preoperative and following instruction phases. The VAS anxiety scores were compared for patients treated for single tooth extraction and multiple teeth extractions (Table 2). There was no significant relation observed in anxiety levels of patients at any phase regardless either one tooth was being extracted or more than one. In addition, there was no significant difference observed ($p = 0.5$) in the anxiety levels for groups 1 and 2 based on the number of teeth being extracted.
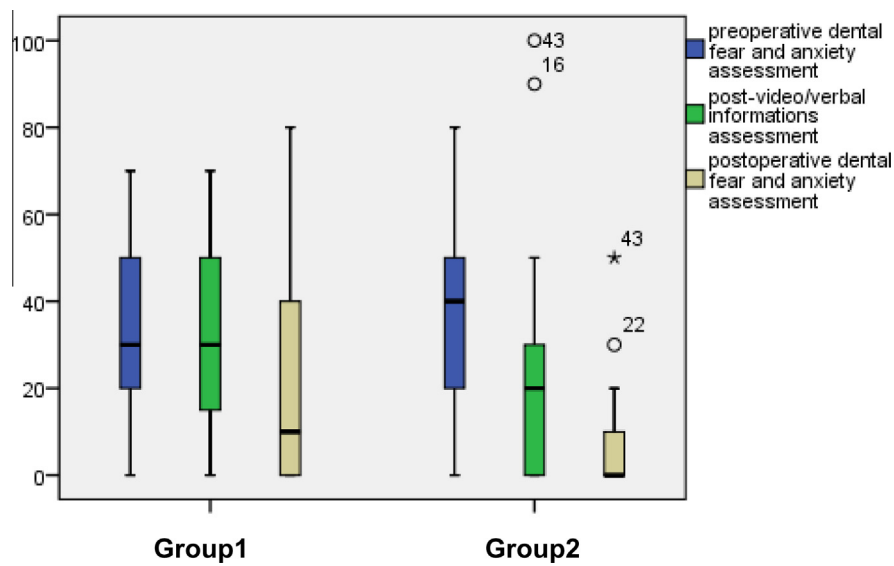
Figure 2 Dental fear and anxiety scores compared for group 1 and group 2.
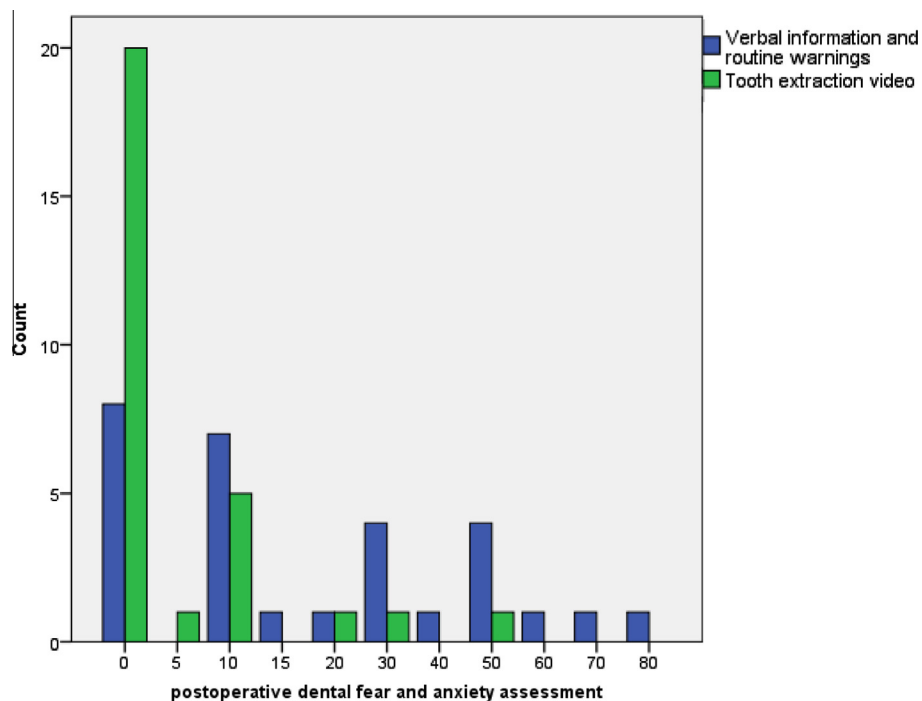

Figure 3 Bar chart represents the distribution of patients in video and verbal groups according to the dental fear and anxiety scores postoperatively.

Table 1 Preoperative and postoperative comparison of anxiety scores in relation to age group and number of teeth being extracted.

		Preoperative	After instructions (verbal/video)	Postoperative
Age (years)	17–29 ($n = 28$)	40.7 ± 21.9 ($p = 0.05$)	30.0 ± 28.1 ($p = 0.02$)	21.1 ± 25.4 ($p = 0.01$)
	30–60 ($n = 30$)	30.5 ± 17.7 ($p = 0.05$)	22.8 ± 16.2 ($p = 0.02$)	8.0 ± 11.6 ($p = 0.01$)
Teeth extracted	One tooth ($n = 41$)	34.3 ± 22.68 ($p = 0.5$)	24.1 ± 23.2 ($p = 0.2$)	15.7 ± 11.1 ($p = 0.4$)
	Two/three teeth ($n = 17$)	38.2 ± 13.3 ($p = 0.5$)	32.1 ± 21.2 ($p = 0.2$)	10.9 ± 9.1 ($p = 0.4$)

Table 2 Comparisons between mean dental fear and anxiety scores for the patients in the two extraction groups preoperatively, post-video/verbal and postoperatively.

	Groups	Number of patients (n)	Mean (standard deviation)	T-value ($df = 56$)	*p*-value
Preoperative	1 tooth	41	34.3 (22.68)	0.672	0.5
	2–3 teeth	17	38.24 (13.3)		
Post-video/verbal	1 tooth	41	24.15 (23.21)	1.21	0.23
	2–3 teeth	17	32.1 (21.21)		
Postoperative	1 tooth	41	15.73 (21.08)	−0.819	0.42
	2–3 teeth	17	10.88 (19.1)		

4. Discussion

Helping anxious patients to defeat their fear of dental treatment is a challenge; however if attained it may bring about change in their oral care and in their general personal satisfaction. Patients showing behaviors, for example incessant cancelation, deferring or rescheduling appointments may be doing so due to dental fear and nervousness (Armfield et al., 2006). Upon recognizable proof of an apprehensive or fearful patient, a reach of measures might be instituted, to manage it. The predominance of dental fear is high in a majority of patients. Dental nervousness does not just influence patients; general dental experts recognize treating anxious patients as a significant source of anxiety (Gazal et al., 2015; Cohen et al., 2000; Al-Samadani and Gazal, 2015). Pharmacological strategies have been utilized to overcome the dental fear extent from mellow sedation to general anesthesia, and are frequently utilized by dental specialists as a part of conjunction with behavioral techniques (Milgrom and Heaton, 2007). One normal tension decreasing prescription utilized as a part of dentistry is nitrous oxide, which causes sentiments of relaxation and dissociation. Dental specialists may endorse oral calming sedatives, for example, a benzodiazepine like temazepam (Dyer, 1999). These narcotics help individuals feel calmer throughout dental treatment and patients are still cognizant and equipped to correspond with the dental staff. Various distractors can play a role to divert patient's attention from fear and anxiety of dental treatment.

In this study, the use of tooth extraction video as a supportive and educational technique was assessed for reducing postoperative dental fear and anxiety. The results revealed that there was a statistically significant difference in the mean dental fear and anxiety scores between the patients in the tooth extraction video and those in the verbal information and routine warning groups ($p < 0.05$). The perception of teeth extraction video preoperatively was more compelling in lessening the intraoperative and postoperative fear and uneasiness connected with dental extractions under LA.

The tell-show-do strategy was initially created for utilization in pediatric dentistry, however can additionally be utilized with anxious grown-up patients. The procedure includes verbal demonstrations of systems in straightforward dialect (tell), emulated by showings of the sights, sounds, smells, and tactile parts of the strategy in a non-threatening manner (show), followed by the real technique (American Academy on Pediatric Dentistry Clinical Affairs Committee-Behavior Management Subcommittee and American Academy on Pediatric Dentistry Council on Clinical Affairs, 2008). In this study it was observed that there was a group of patients who recorded a high level of dental fear and anxiety at the baseline assessment, they scored less after watching the tooth extraction video. One possible explanation given by these patients is that their traumatic dental experience was eased off by watching a painless tooth extraction video. In this study there was another group of patients who scored high level of dental fear and anxiety in the baseline assessment. The patients reported that the seeing of dental instruments spread out on dental chair made their fear and anxiety getting worse. On the other hand, the level of fear and anxiety dramatically dropped down after watching the tooth extraction video. The harmless technique employed by the dental surgeon for the tooth extraction and the gentle use of dental instruments demonstrated in the video gave the patients a feeling of safety and consequently reduced their instrumentation phobia (Ugurlu et al., 2013).

This study has reported that the dental fear and nervousness scores were also impacted by the patient's age at the postoperative phases of the assessment. Patients (30 years or younger) reported higher dental fear and nervousness/anxiety scores compared to 31 years or older patients postoperatively. These results are consistent with the findings of previous studies (Gazal et al., 2004; Al-samadani and Gazal, 2015). Regarding gender, it should be noted that sexual category differences in pain reporting could be as a result of behavioral differences rather than perceptual biological differences (Jones et al., 2003). Similarly, Appukuttan et al. (2013) reported that more youthful patients, uneducated, unemployed and lesser wage groups were dentally more nervous. These findings have suggested that the phobia and fears are reduced with age, variables such as eradication or habituation, and versatile acquiescence toward the inevitable (Appukuttan et al., 2015). This study indicated that the number of removals of teeth performed had no significant effect on postoperative dental fear and anxiety in patients. The negative relationship between having more number of teeth being extracted and increased stages of dental fear and anxiety may be related to good local anesthetic technique and bleeding control postoperatively. Pain control in dentistry is a critical component, to diminish the trepidation and uneasiness connected with dental methods (Oliveira et al., 2004: Al-Samadani and Gazal, 2015). In order to control the fear and anxiety in dental patients, recorded video clips act as an encouraging technique as well as an excellent source of educational information for the patients.

5. Conclusions

Dental fear and anxiety associated with dental extractions under local anesthesia can be reduced by presenting a tooth extraction video to the patients preoperatively. Number of

dental extractions has no impact on anxiety level. Dental treatment videos can be of value to educate the patients and reduce their level of fear and anxiety. So it is strongly recommended for all dental clinics and institutions to have audiovisual facilities for patient education. Furthermore, it may be beneficial to run such educational programs in patient's waiting area on regular basis. In the study sample only males were included as only male patients are treated in Taibah Dental College, so females should be included in future studies for more valid and stronger results.

Conflict of interest

The authors declared no conflict of interest for conducting this research.

Acknowledgment

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