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Does Audio-visual Information Affect Anxiety and Perceived Pain Levels in Mini-screw Application?–A Study in South Indian Population

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ABSTRACT

Introduction: *During dental procedures, increased anxiety levels in patients is a major problem faced by clinicians. Anxious patients are more likely to be uncooperative while carrying out dental procedures which may frustrate the clinician leading to delay in the procedures. Therefore, the aim of this current study was to assess the effects of verbal and audio-visual information on patients' anxiety levels before mini-screw placement.*

Methodology: *10 subjects who were undergoing fixed orthodontic treatment and required Orthodontic miniscrews for augmenting treatment were chosen for this study. The subjects were allocated in two groups. One group watched a video depiction of mini-screw placement whereas the other group was informed verbally about the procedure. The Spielberger state-trait anxiety inventory (STAI) was used to measure anxiety immediately after mini implant placement. Descriptive statistics using percentages was carried out to evaluate the response of the subjects to Spielberger state-trait anxiety inventory questionnaire concerning their anxiety level during placement of mini-implants. Student's t-test was performed to evaluate the difference of anxiety scores in different groups and independent t-test was performed to evaluate the difference of anxiety scores in between genders.*

Results: *Student's t-test was carried out and it was found to be statistically non-significant difference of the anxiety scores ($p>0.05$). Independent t-test was performed to evaluate the difference of anxiety score between genders and it was found to be statistically non-significant ($p>0.05$). Descriptive statistics indicated that anxiety level was higher in patients (54.4 %) who were informed about the procedure verbally than the ones who were given an audio-visual depiction of it (46.6%).*

Conclusion: *It was observed that the subjects who were shown video depiction of the implant placement procedure were less anxious than the patients who were verbally informed about it.*

Key words: Audio-Visual, Verbal, Stai, Anxiety, Miniscrews, temporary anchorage device

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INTRODUCTION

During dental procedures, increased anxiety levels in patients is a major problem faced by clinicians. Anxious patients are more likely to be uncooperative while carrying out dental procedures which may frustrate the clinician leading to delay in the procedures.1 Anxiety is a complex emotion that could be due to dental fear, socio-economic status, parental dental anxiety, etc [1].

There are various self-assessment questionnaires to assess anxiety. STAI (Self-trait anxiety inventory) is a form of questionnaire which measures trait anxiety and state anxiety. Trait anxiety is a temporary emotion felt by a person. It is an emotion felt in the time of fear and danger whereas state anxiety is permanent throughout a person's life and is based on its personality characteristic [2]. The sum of these two scales amount to total anxiety.

Mini-screw anchorage has become an essential part of orthodontic treatment plans, nowadays. The placement of miniscrews requires a minor surgical procedure which could cause an unacceptable amount of pain but at the same time it can cause anxiety to the patient. If the patient is informed prior about the procedure, it can cause less anxiety and make them more co-operative towards the procedure.

The root cause of pre-operative anxiety could be due to a patient's concern about his/her general health, uncertainty about the procedure, type of surgery, post-operative discomfort and pain. Providing information to the patient regarding the procedure allows the patient to be more aware of it and this in turn, could reduce anxiety and stress. Information provided to the patient could be either verbally or audio-visually, or a combination of both. A study conducted by Stephens R et al. reported that

patients who were informed about the procedure verbally followed by audio-visual depiction added up to being more advantageous. However, a study reported by Srai et al reported that delivering combined multimedia and verbal information was insufficient to reduce anxiety levels and stress among the patients.

This knowledge was instrumental for us to study the audio-visual information affecting anxiety and perceived pain levels in mini-screw application– A study in the South Indian population [3].

METHODS

Study design

This is a prospective controlled trial evaluating the anxiety levels of patients who were informed about the procedure either verbally or audio-visually before mini-screw placement. The study consisted of 10 subjects within the age group of 22-30 years (6 males and 4 females).

Inclusion criteria:

1. Subjects who were undergoing fixed orthodontic treatment and required mini-screw placement based on need for additional anchorage.

Exclusion criteria:

1. Subjects who were not willing to participate in the study.

Sampling

Participants were allocated into two groups, group A (n=5) and control group B (n=5). Group A consisted of subjects who were informed about the procedure audio-visually and Group B consisted of subjects who were verbally informed about the procedure.

Procedure

The procedure was performed in the influence of infiltrative local anaesthesia with less than one quarter of the cartridge.

The sterile implant with the help of screwdriver was placed in the posterior buccal region. Self-drilling miniscrews (8 mm length, 1.5 mm diameter, SK surgicals) were placed following the guidelines recommended with no incision or soft tissue removal from the attached gingiva prior to insertion.

Following the insertion, patients were instructed to maintain good oral hygiene to prevent failure of the implant.

The audio-visual information was provided with the help of a video that was taken from external sources depicting the placement of miniscrews. The video depicted the placement of miniscrews on a typhodont. The script for the verbal information was as follows-

"First, local anaesthetic will be injected. After the

Injection, mini-screw of 8mm in length and 1.5mm in diameter

will be inserted with a screwdriver."

The audio-visual as well as verbal information about the procedure was provided by the same researcher (AT). The anxiety level was measured with the help of Spielberg STAI just before the placement of mini-screw. State anxiety scale (STAI-S) consists of 20 questions enquiring how the patient feels at that moment of the insertion with respondents rating anxiety level from one (1) (not at all) to four (4) (very much so). The trait anxiety scale (STAI-T) also consists of 20 questions assessing their anxiety level from rating one (almost never) to four (almost always).

Statistical Analysis

After the collection of data from the subjects, the data was analysed. Descriptive statistics using percentages was carried out to evaluate the response of the subjects to Spielberger state-trait anxiety inventory questionnaire concerning their anxiety level during placement of mini-implants. Student's t-test was performed to evaluate the difference of anxiety scores in different groups and Independent t-test was performed to evaluate the difference of anxiety scores in between genders. These analyses were carried out using IBM SPSS statistical software (Version 23.0).

RESULTS

The completed questionnaire was collected from 10 patients over a period of two weeks from March 2019 to April 2019 and analysed. Table 1 represents the mean, standard deviation of anxiety scores in control group and study group.

It also represents the student's t-test and there was a statistically non-significant difference of anxiety scores observed ($p>0.05$).

Table 2 represents the mean and standard deviation of anxiety scores in different genders. It represents an independent t-test and it was found to be a statistically non-significant difference of the anxiety scores in different genders.

Fig 1 represents the percentage of anxiety level in subjects. It was observed that the anxiety level was higher in patients (54.4 %) who were informed about the procedure verbally than the ones who were given an audio-visual depiction of it (46.6%).

Table 1: Evaluation of anxiety scores in different groups.

	CONTROL GROUP	STUDY GROUP	t	p value
	MEAN ± S. D	MEAN ± S. D		
STATE ANXIETY		2.55±0.12	-2.19	0.273
	2.5±0.86			
TRAIT ANXIETY	2.5±0.11	2.14±0.03	-1.19	0.43
TOTAL ANXIETY	5.0±0.97	4.64±0.15	3.38	0.7

Table 2: Evaluation of anxiety scores in different genders.

	CONTROL GROUP		p Value	STUDY GROUP		p Value
	MEAN (SD)			MEAN (SD)		
	MALE	FEMALE		MALE	FEMALE	
STATE ANXIETY	2.57±0.08	2.60±0.06	0.886	2.55±0.82	2.50±0.54	0.892
TRAIT ANXIETY	2.42±0.002	2.51±0.03	0.592	2.57±0.96	2.46±0.03	0.589
TOTAL ANXIETY	4.99±0.082	5.11±0.09	1.47	5.12±1.78	4.96±0.75	1.48

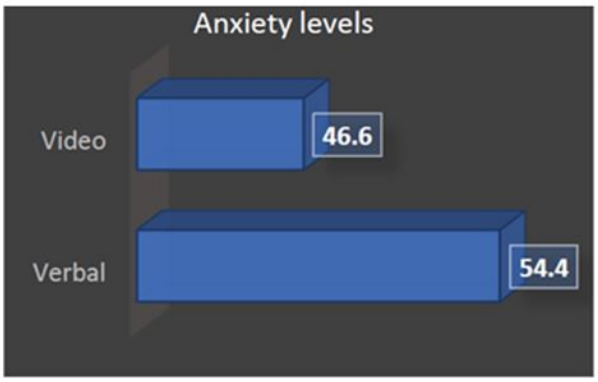

Figure 1: Percentage of anxiety level in subjects.

Discussion

Mini-screw placement is a simple procedure but at the same time it can be a little invasive, making the patient anxious. It was hypothesized that audio-visual depiction of the procedure would reduce the anxiety levels in patients. To record this, STAI-S and STAI-T were taken. In the present study it was observed that the subjects who were verbally informed about the procedure were more anxious as compared to those who were shown an audio-visual depiction of it. Therefore, this result satisfies our hypothesis.

It was observed that 54.4% of the subjects were anxious after verbal information of the procedure than those who were audio-visually informed about it. According to a study conducted by Stephens R et al. reported that patients who were informed about the procedure verbally followed by audio-visual depiction added up to being more advantageous but unlike our study these subjects were informed about the procedure both, verbally and audio-visually. Study conducted by Prabhat Chaudhari et al. reported that there is a positive correlation between dental anxiety and pain associated with mini-screw placement [4].

Another study conducted by Berra Calik Koseler et al. reported the association between anxiety level and mini-screw placement; audio-visual methods caused more anxiety in patients which doesn't satisfy our hypothesis. Zafer Sari et al. reported that anxiety level was reduced in patients who were undergoing treatment since last year but the present study was short-term.

Meta-analysis reported on dental anxiety by Gerd et al concluded that patients undergoing behavioural intervention for dental fear can be expected to report on significant reduction in their fear. It is indicated that increasing the quantity of postoperative preparatory information will increase pain relief.

In the present study it was observed that there was statistically non-significant difference observed of the anxiety scores in different genders and this finding was in agreement with the study conducted by Berra Calik Koseler wherein there was no statistically significant difference in the anxiety scores between the male and female patients in either groups. Similarly, a study conducted by Jemnique et al reported that sex did not significantly affect anxiety.

In contrast to the findings of our study, KC Prabhat et al reported that females are more anxious as compared to males but they measured anxiety using Corah's dental anxiety scale which consisted of four questions to assess dental anxiety and the other was the dental fear survey (DFS), which consisted of 20 questions unlike our study where we used STAI questionnaire. Similarly, Hakki et al reported that females had significantly higher levels of anxiety as compared to males.

Small sample size is the limitation of this study. Future scope of this study indicates that preoperative information will reduce the anxiety in patients and they will be more cooperative for the treatment [5].

CONCLUSION

From the study conducted, it was evident that subjects who were shown video depiction of the Orthodontic mini-screw placement procedure were less anxious than the ones who were verbally informed about it. The same

strategy can be implemented in other minor surgical procedures too to make the patients co-operate better.

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CONFLICT OF INTEREST

Nil

AUTHORS' CONTRIBUTION

AT contributed with study designing, data collection, data evaluation, manuscript typing and revision of manuscript. SD contributed with study designing, data evaluation, manuscript typing and revision of manuscript. AT and SD contributed for data evaluation and manuscript revision.

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