

A Comparative Study of the Level of Anxiety Reduction through Medication and Giving Awareness and Relaxation to Patients

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Abstract

Introduction and Objectives: Today, a large number of people visit the dental clinics with anxiety and this is significantly increasing. It seems that the origin of this anxiety is the negative experience of people in the past which is the most important reason for the emergence of this fear and anxiety from dentistry. Therefore, in this study, the reduction in anxiety was compared through medication and giving awareness and relaxation to patients visiting the dental clinic. **Method:** In this study, 80 patients visiting the Department of Periodontics of the dentistry faculty were divided equally between men and women into three groups: group A (anxiety reduction with diazepam), group B (reduction of anxiety by giving awareness and relaxation) and group C (anxiety reduction with Placebo). In each group, the anxiety level of the patients was compared before and after the anxiety reduction protocol. **Results:** In this study, it was found that in group B, which their anxiety decreased by giving awareness and relaxation, the average of anxiety before and after reduction protocol was 50.23 and 18.88, respectively, showed by $P < 0.001$. **Conclusion:** Regarding the importance of decreasing anxiety in patients visiting the dental clinics, the necessity of knowledge of the patients about dentistry, and considering this study, the method of giving awareness and relaxation, in comparison with other methods, has a higher percentage in reducing anxiety.

Keywords: Anxiety of Dentistry, Anxiety Reduction, Fear of Dentistry, Excitement of Dentistry

Introduction

Today, a large number of people visit the dental clinics with anxiety, and this case is significantly increasing. Stress is a condition or feeling of being burdened or overloaded, tense, worried, and anxious (Sob & Roy, 2017). Anxiety is an emotional and physiological response to an entirely internal feeling of risk that simply goes away. Anxiety is a common and widespread problem; it is estimated that 5-7% of the population never or rarely goes to dental clinics (Armfield & Heaton, 2013). Fear of

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dentistry is one of the most common fears, and the Diagnostics and Statistics of Psychic Disorders DSM-IV has classified it as a "special fear." (Appukuttan, 2016) Although many studies have been done on the prevalence of these conditions, it is very difficult to estimate the exact extent of this event, as a large number of people hide this feeling and do not even go to the clinics. In general, and according to studies, this is estimated at 4-20% (Lundgren et al., 2016). It seems that the origin of this anxiety goes back to the negative experiences of people in the past which is the most important reason for the emergence of this fear and anxiety from dentistry, even though these experiences can even be derived from hearing or even seeing, not necessarily from the personal experience of individuals (Hofer et al., 2016). Working with such anxious people will increase the negative impact on the quality of dental health care, which will cause job fatigue and lack of motivation. Dental anxiety and fear is an important factor for decreasing patient visits to the dentist (Lundgren et al., 2016). This, in addition to reducing the general public's oral health, can lead to personal oral health problems. Moreover, the feeling of anxiety before any horrible condition may affect the person's capacity for work and social activities (McNeil & Randall, 2014).

Fear can be divided into two categories: subjective fear, which includes the inner feelings, the perception and knowledge of the individual, and objective fear, which includes physiological behavior and reactions (Klingberg et al., 2016). One of the most important ways of developing a patient's emotions is through subjective fears. Thus, identifying and understanding these emotions in providing dental treatment is essential. Of course, the extent and degree of fear are different such that some people hardly, and others do not even tend to go to dental clinics (Campbell, 2017). To describe different types of fears, some terms such as fear (the mildest type), anxiety, and phobia (the most severe type) can be used. Fear, which usually occurs without an external threat, should be distinguished from anxiety (Wright et al., 2017). In addition, fear is associated with specific escape and avoidance behaviors, while anxiety is caused by threats that are considered inevitable and irrepressible. Fear is usually associated with pain⁷. It is believed that fear is created in response to a real, particular and abrupt stimulus, while anxiety does not have a specific origin, it can be developed over a long period of time (Morgan & Porritt, 2017). Anxiety is an unpleasant and vague feeling of panic and worry with an unknown origin

that includes uncertainty, frustration, and physiological arousal. This type of fear depends on the ability of the imagination (Cianetti et al., 2017). Dentistry anxiety is often associated with negative events in the past, especially traumatic experiences and fear of pain. Phobia is a persistent and sickly type of fear in a person that disrupts her everyday life. Unlike normal fear that is a natural reaction to a temporary and external risk, phobia is a fear of being in a dangerous situation, such as fear of flying or driving (Facco et al., 2015).

Based on the cultural and emotional reasons, people's perceptions of anxiety may vary (Sanei & Nabavi Chasmi, 2018). The severity of anxiety can be assessed using a standard questionnaire; the Dental Anxiety Scale is one of the most well-known and most commonly used one (Seligman et al., 2017). Clinical and research experiences show that many people with anxiety can be easily treated if the amount of fear is low. However, people who are extremely anxious should be treated medically or psychiatrically. Anxiety and avoidance of treatment will have obvious and destructive effects on the oral health of patients (Kılıç et al., 2014). If this situation continues, simple treatments become complex processes like endodontic therapy and tooth extraction. Such complex interventions can have a detrimental effect on a person's psychic personality (Khan et al., 2016).

Oral medications are a simple and effective way to control anxiety, and many different drugs, such as benzodiazepines, and antihistamines are used for this purpose. Herbal medicines like Passionflower that have sedative effects have also been used to reduce the amount of anxiety throughout history. In addition, diazepam (Benzodiazepine family), general anesthesia, systematic desensitization, and so on is also used (Hellwig & Lussi, 2014). Diazepam which its liver metabolites are also active is a sedative and hypnotic drug effective in the treatment of long-acting benzodiazepines. Diazepam is prescribed to relieve anxiety, sleep disorders and panic disorder. It is also used as an anticonvulsant and skeletal muscle relaxant, muscle contraction and seizure treatment (fever and seizures in children or epileptic seizures). Diazepam, like other benzodiazepines, is an agonist of benzodiazepine receptors that takes effect by impacting GABA receptors¹, and ultimately, chlorine ion influences neurons (Woof, 2014).

One of the most commonly used methods for treating specific fears is Cognitive Behavioral Therapy that is a regular desensitization method (Heyman et al., 2018). In this method, the person is carefully and securely exposed to a subject or situation that is afraid of, in which the most common method is a gradual approach, first in the mind and with the help of the imagination and then in reality. Of course, there must be enough intervals between the steps and it should also be combined with sedative

techniques, supported and controlled by the psychotherapist. By repeating this experience, one finds that, although this is an unpleasant situation, it is not harmful and by subjecting to panic cases, the feeling of control over that fear in the individual increases; this feeling of controlling the situation is the most important achievement of this method (Porritt et al., 2017).

Artman et al. (2000) conducted a study in the Netherlands in 2000. The purpose of the study was to evaluate the outcome of anxiety treatment in 280 patients. In this research, behavioral management, nitrogen oxide and venous sedative were used. All patients avoided going to the dental clinics for an average of 8 years. During one year, the Dental Anxiety Scale was used 3 times to evaluate the anxiety of these patients. At the end of this study, it was found that patients treated with behavioral management showed better results than the other two groups (Shahnavaz et al., 2016). Wining et al. in a case-control study that conducted in Ireland with 30 periodontitis patients to compare the effect of 2mg diazepam and placebo, found that this drug could significantly reduce the patients' fear and pain from surgical procedures. It should be noted that these cases were performed by Visual Analog Scales (VAS) (Thompson et al., 2010). Folayan MO et al. (2004) conducted a study in Nigeria on 84 children aged 8 to 13 years old and found that past patient information had a very small impact on the amount of stress when visiting dental clinics (Hollon et al., 2006). Anna Frydendal Hoem, (2012), conducted a study in Norway as a review article and found that the patient anxiety can be reduced by both medication and relaxation (Tvermyr et al., 2012). Kaviani et al. (2013), conducted a study in Shiraz focused on reducing the anxiety of dental patients using Passionflower and it was found that extract of this plant can effectively reduce anxiety in these individuals. It should be noted that in this study 63 patients in 3 groups of 21 patients participated in a clinical study (Kaviani et al., 2011).

The purpose of this study was to compare the reduction of anxiety by medication and giving awareness and relaxation to the patients visiting the Department of Periodontics of Zahedan Dental School in 2014.

Method

This study was a randomized clinical trial. The study population consisted of patients in the Department of Periodontics of the dental school of Zahedan including men and women between 20 and 30 years old visiting for teeth cleaning.

The criteria for entering the study included all patients aged 20 to 30 who visited the dental faculty for teeth cleaning at the Department of Periodontics. There was also mental health (lack of a history of hospitalization or mental illness according to interviews) and at least reading and writing ability. The criteria for quitting the study included the lack of proper cooperation and consent to participate in the study, lack of mental health, absence in treatment, using sedative medicines, having a stressful dental treatment in the past (because of an unreasonable increase in anxiety), and contraindication for using diazepam (patients with a

¹ The GABA receptor is one of the two Ligand-gated ion channels, responsible for transferring the effect of Gamma-Aminobutyric acid. The stimulation of this receptor decreases the excitability of neurons by increasing the entry of negative chlorine ions into the cells. Alcohol and benzodiazepines involves the GABA system.

history of sensitivity to benzodiazepines, myasthenia gravis patients, and patients with apnea history).

In this study, all of the patients visiting the Department of Periodontics of the faculty of dentistry who were eligible (for entry and exit criteria), aged 20-30, and needed teeth cleaning treatment, were selected through convenience sampling method with their informed consent. According to the methods of anxiety reduction protocol, they were divided into 3 groups: first group consisting 24 people (half females and half males) were treated by diazepam (group A), and the second group consisting of 26 people (half females and half males) passed the therapy through a conversation and giving awareness and relaxation (Group B) and a third group of 30 people (half females and half males) were prescribed placebo at the same amount and at the same time on the morning of the surgery day (Group C). In addition, in all three groups the DAS questionnaires (as indicated in the implementation method) completed before and after the anxiety reduction process.

To reduce the anxiety of group A, diazepam was used with 2mg dose in the morning of the surgery day, and the group B passed the process of therapy only by talking and giving awareness about the type of dentistry and relaxation, and group C used the same amount of placebo at the same time in the morning of the surgery day. It should be noted that each of these individuals completed the questionnaire before any intervention, and finally completed the same questionnaire after completing the anxiety reduction process; the score obtained from the DAS test was the benchmark of this study. The score in this questionnaire is as follows: each question was scored from 0 to 4 in terms of the degree of patient anxiety. If the patient has no anxiety, the score is 0 and by more anxiety, this score increases. The final anxiety in the last option is 4. In the end, these numbers were summed up and scored. The data were collected by SPSS software for analysis. The data was collected using a Corah's Dental Anxiety Scale (Revised) (DAS-R). Estimation of the obtained scores for the individuals and entering the information of each person based on the studying group was performed in SPSS software to analyze the data in the questionnaire of the method of completing and scoring each person. After data collection, independent T-test and one-way ANOVA were used to determine the parametric conditions. The Dunnet test was also used to compare the variables in the dual groups. Paired T-test was used to compare the amount of change in the desired outcome in paired groups. In the case of nonparametric conditions, equivalent tests were used for independent and dependent groups. In this study, 95% confidence level, 5% alpha error, 5% significant level and 80% power were considered. All analyzes were conducted bilaterally and, if possible, one-way in the software version 11.

Findings

In this study, 80 patients who referred to the Department of Periodontics at the Faculty of Dentistry were included in the study and were evaluated. Three treatment groups were treated with diazepam sedative drug, giving awareness, and a placebo

group. Based on ANOVA, the average age of patients in the diazepam group, the awareness group, and the placebo group was 24.83, 25.26, and 25.26 years respectively. As shown in table 1, the mean age of the diazepam group is lower than the two other groups. But this difference is not statistically significant, in a way that the three groups are the same in terms of age ($P = 0.827$).

Table 1- Determination and comparison of the average age in the three studied groups

Group	Number	Mean	Standard deviation	Interval of confidence		Minimum	Maximum	p.v*
				Lower limit	Upper limit			
Diazepam group	24	24/83	0/51	23/76	25/90	20	30	0/827
Awareness group	26	25/26	0/58	24/06	26/47	20	30	
Placebo group	30	25/26	0/55	24/12	26/40	20	30	

According to chi-square test, 24 patients in the diazepam group (12 males and 12 females), 26 patient in the awareness group (13 males and 13 females) and 30 patient in the placebo group (15 males and 15 female) were examined. There was no significant difference between the three groups in terms of gender frequency differences (Table 2).

Table 2- The gender determination and frequency in the three studied groups

Gender	Diazepam group	Awareness group	Placebo group	Total	p.v*
Male	(50) 12	(50) 13	(50) 15	40	1
Female	(50) 12	(50) 13	(50) 15	40	

Based on paired t-test, the mean anxiety score before taking diazepam and after the intervention was 52.7% and 33.2% respectively. As shown in Table 3, the mean anxiety score of patients has been reduced after taking diazepam and this difference was statistically significant ($P < 0.001$). Mean anxiety score before communicating with patients and giving awareness to them, and after the intervention, was 23/50 and 18/88 respectively. Therefore, the mean anxiety score of patients after communication and giving awareness has decreased, and this difference is statistically significant ($P < 0.001$). Mean anxiety score before and after taking a placebo and after the intervention was 50/16 and 38/38 respectively. Therefore, the mean anxiety score of patients after taking placebo has decreased, and this difference was statistically significant ($P < 0.001$). Generally, the extent of anxiety reduction (anxiety after intervention - anxiety before intervention) in the diazepam group, the communication and awareness group and the placebo group was 19, 32 and 12, respectively. Therefore, as shown in Table 3, the rate of anxiety reduction in the communication and awareness group is greater than that of the diazepam group and the placebo group.

Table 3- Determination and comparison of anxiety level before and after taking the diazepam sedative drug, communicating and giving awareness, and taking the placebo

Group	Intervention	Number	Mean	Standard deviation	p.v*
Diazepam	Before	24	52/7	0/53	0/001>

group	intervention				
	After intervention	24	33/2	3/31	
Awareness group	Before intervention	26	50/23	0/65	0/001>
	After intervention	26	18/88	3/19	
Placebo group	Before intervention	30	50/16	0/40	0/001>
	After intervention	30	38/03	2/8	

Based on ANOVA, the anxiety level before intervention in the diazepam group, the communication and awareness group, and the placebo group was 52/70, 50/23, and 16/50, respectively. As can be seen in table 4, the anxiety level in the diazepam group is higher than the two other groups. This difference is statistically significant, meaning that the three groups are different in terms of anxiety before the intervention (P = 0.002). Based on ANOVA, the anxiety level after intervention in the diazepam group, the communication and awareness group, and the placebo group was 25.23, 18.88 and 0.33, respectively. As shown in table 4, the anxiety level of patients in communication and awareness group is lower than the two other groups. Also, the anxiety level in patients of the placebo group is higher than the two other groups. This difference is statistically significant, meaning that the three groups are different in terms of anxiety after intervention (P <0.001).

Table 4- Determination and comparison of anxiety level before and after the intervention in the three studied groups

Intervention	Group	Number	Mean	Standard deviation	Interval of confidence		Minimum	Maximum	p.v*
					Upper limit	Lower limit			
Before intervention	Diazepam group	24	52/70	0/53	51/59	53/81	44	57	0/002
	Awareness group	26	50/23	0/65	48/87	51/58	41	58	
	Placebo group	30	50/16	0/40	49/32	51	44	54	
After intervention	Diazepam group	24	33/25	3/31	26/39	40/10	8	52	0/001>
	Awareness group	26	18/88	3/19	12/31	25/45	4	49	
	Placebo group	30	38/03	2/80	32/29	43/77	9	54	

The anxiety level in men (52.58) in the diazepam group before anxiety was approximately equal to the anxiety level in women (52.83). Consequently, they did not differ from each other (P = 0.822). The anxiety level in women after intervention (34.14) was more than men (32.08). But they did not differ statistically (P = 0.733). The anxiety level in women before and after intervention in diazepam group was significantly different (P = 0.001), and the anxiety level of men in this group before and after the intervention was also significantly different (P = 0.003). The extent of anxiety reduction in men was higher than in women (20 versus 18). The anxiety level in men (51/38) in the communication and awareness group before anxiety, was higher than in women (49.07). But they did not differ statistically (P =

0.079). The anxiety level after intervention in women (19.44) was more than men (17.92). But they did not differ statistically (P = 0.770). The anxiety level in women before and after the intervention was significantly different in the communication and awareness group (P <0.001). Also, the anxiety level in men before and after the intervention was significantly different in the diazepam group (P <0.001). The extent of anxiety reduction in men was higher than in women (34 versus 30). The anxiety level in men (48/86) in the placebo group before anxiety, was lower than in women (51.46). But they did not differ statistically (P = 0.001). The anxiety level in women after intervention (38.4) was more than men (37.66). But they did not differ statistically (P = 0.899). The anxiety level in women in the placebo group before and after the intervention was significantly different (P = 0.025). Also, the anxiety level in men in diazepam group before and after the intervention was significantly different (P = 0.005). The extent of anxiety reduction in women was higher than men (13 versus 11) (Table 5).

Table 5- Determination and comparison of anxiety level before and after taking the diazepam sedative drug, communicating and giving awareness, and taking the placebo in both genders groups

Group	Intervention	Number	Male		Female		p.v*
			Mean	Standard deviation	Mean	Standard deviation	
Diazepam group	Before intervention	12	52/58	0/92	52/83	2/03	0/822
	After intervention	12	32/08	5/27	34/41	4/22	0/733
	p.v*		0/003		0/001		
Awareness group	Before intervention	13	51/38	0/83	49/07	0/93	0/079
	After intervention	13	17/92	4/33	19/84	4/84	0/770
	p.v*		0/001>		0/001>		
Placebo group	Before intervention	15	48/86	0/52	51/46	0/42	0/001
	After intervention	15	37/66	4/20	38/4	3/86	0/899
	p.v*		0/025		0/005		

* Based on independent t-test -&: Based on paired t-test

Discussion and Conclusion

One of the most common causes of fear of everything is its unknown nature. When we do not know what we are going to face with, whether or not we get anxiety and stress which in some people can be very severe and even crippling. An important reason for the fear and anxiety of many patients from dental treatment is that they do not have the proper information about the treatment process and its nature (Reiss et al., 1986). Dental treatments are such that the patient cannot see the treatment process at all, and since he does not have any control over what happens inside his mouth, consequently gets anxious and frightened. The diagnosis of fear and anxiety, as well as its measurement, is one of the issues that has involved the minds of scholars for many years; so far several ways have been proposed and invented for it. Given that the cases such as fear and anxiety are mental, and practically cannot be quantitatively measured like length and volume, none of the existing methods can claim that

they are 100% complete and able to measure anxiety. However, scientists have a great tendency to quantify measurements in such cases to evaluate their treatment results and the ability to compare different therapies. As it was observed, the anxiety caused by dental treatment in patients after giving awareness and relaxing them had a significant reduction compared to the two other groups. This result is consistent with the other findings²⁸⁻²⁵. This research has shown the impact of giving awareness and relaxing the patients on reducing the anxiety caused by dental treatments. In a study conducted by Jay et al., the positive effect of giving awareness on reducing the confusion caused by dental treatments was confirmed. They also reported cognitive-behavioral interventions more effective than sedative drugs²³. Giving awareness and calmness can probably cause relative physical relaxation, and subsequently, create changes in physiological parameters. Deep breathing and mental imagery can provide relaxation in the patient, and act as a stress and anxiety control method in interacting with other components. Also, giving awareness and relaxation can be considered as an attentional switching mechanism (Jay et al., 1983).

Giving awareness and relaxation with the intervention in the cognitive elements can turn into therapeutic effect. It provides the individual with an active coping method against anxiety; thus, he comes out of passive mode and actively participates in self-control and behavior modification. In a study by conducted by Folayan MO et al., it was clear that the use of psychological methods has been effective to reduce children's fear and anxiety in dental treatment and has been able to reduce their anxiety scores (Hollon et al., 2006). In another study conducted by Catherine et al, it was found that both methods of giving drug and relaxation of the patient can reduce the patients' anxiety (Patel et al., 2006). In a study conducted by Lewis et al. in the form of a case-control study, 30 patients with periodontitis were tested for diazepam 2 mg compared to placebo and it was found that this drug can significantly reduce the patients' anxiety and pain caused by surgical procedures (van der Merwe et al., 2011). In a study conducted by Arthman et al., they compared behavioral management with a nitric oxide sedative drug to reduce anxiety. At the end of this study, it was found that patients treated with behavioral management had a better outcome than the other group (Shahnavaz et al., 2016).

In many previous studies, it has been confirmed that there is more anxiety in women than men. Generally, the reason for this can be due to the fact that the prevalence of anxiety disorders in women is higher than men. The effect of approximate anxiety reduction in reducing the disorders caused by dental procedures is due to the impact of the therapist's words. The researcher believes that many of the psychological processes affect the perception of pain. Given the above, the importance of the impact of dentist' procedure and behavior on the people's view of the dentistry, is clear in their response to different treatments. Therefore, dentists should make the most of their efforts to treat a patient in a calm atmosphere. Because creating an unfavorable and unpleasant memory in the patient causes the fear and anxiety from the next visit, and possibly losing his working days and useful time (29-39).

However, the dentist plays a very important role in reducing the patients' anxiety. The dentist can reduce the patients' fear of instruments and treatment procedures by explaining about them to the frightened patients. Patients who are afraid of dentistry can ask the dentist before starting treatment to explain the procedures and the supplies used in the treatment. Also, variation in dental work environments, the behavior of dentists, and the perception of anxiety can change the results of such research. Therefore, the existence of these variables can make the generalizability of the results somewhat difficult and limited. Given that the number of dental clients is increasing, and the use of treatment techniques such as anesthetics and medication requires a high cost, and on the other hand, these methods are harmful due to causing pain and fear, giving awareness and relaxation is important to reduce the anxiety caused by dental treatment. Therefore, it is recommended that dentistry clinics and offices give their patients awareness and relaxation about treatment procedures in order to facilitate their treatment. In addition, it seems that dentists should spend more time with patients, especially women, to make them relaxed and gaining their trust. Considering the importance of reducing anxiety in patients referred to dental clinics, as well as the necessity of giving awareness to patients about the dentistry procedures, and also considering this study in which the method of giving awareness and relaxation had a higher percentage in reducing anxiety than the two other methods, this method is selected.

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