

Effect of Emotional Self-Regulation Strategies and Systematic Desensitization on Stress Level of Adult Dental Patients: A Clinical Trial

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Abstract

Background and Aim: This study aimed to compare the effects of emotional self-regulation strategies and systematic desensitization on stress level of adult dental patients.

Materials and Methods: The study population included 40 adult dental patients that were selected by purposeful sampling and were classified into two experimental groups of emotional self-regulation strategy (n=20) and systematic desensitization (n=20). Data were collected using a stress questionnaire. The experimental groups received 8 sessions of 90-minute emotional self-regulation strategy and desensitization instructions. Data were analyzed by t-test and paired t-test.

Results: Emotional self-regulation and systematic desensitization affected the stress level of adult dental patients. However, there was no significant difference between the effects of emotional self-regulation and systematic desensitization on stress levels of adult dental patients (P>0.05).

Conclusion: Emotional self-regulation and systematic desensitization instructions equally affected the stress level of adult dental patients in this study.

Key Words: Stress; Psychological; Emotional Regulation; Desensitization; Psychologic; Dentistry

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Introduction

Management of dental stress and anxiety of patients is a challenge for most dentists [1]. Stress is a multi-dimensional emotion related to psychological, social and situational factors [2,3]. There are different techniques to control dental stress including sedative and hypnotic drugs, behavioral-cognitive methods, or their combination. Behavioral-cognitive methods are a relatively novel approach in psychology emphasizing on behavioral change through cognitive processes. One such method that

plays a significant role in stress reduction is to be able to control emotions. The ability to control emotions requires acquiring skills to identify, organize, and express emotions. Such methods are applied during emotion production process. Emotion production model was introduced by Gross and Manoz [4], and has five stages that each individual can use them differently.

Some of the regulatory strategies have positive effects on emotional experiences while some others have negative effects. Controlling

emotions and using emotional self-regulating strategies can lead to stress reduction in dentistry and create a positive attitude towards dentistry.

Another relatively novel method in psychology is systematic desensitization that emphasizes on behavioral change through cognitive processes. The objective of such methods is to change feelings and behavior of individuals through impact on thinking and behavioral patterns and stress reduction. In these methods, based on the counterconditioning principle, some responses are firstly identified that are against fear. Then, the participants are asked to express the contrary responses to stress in stressful situations. Systematic desensitization is the most well-known technique introduced by Wolpe [5]. It includes three processes: Deep relaxation instruction, hierarchical regulation of anxiety and stress, and rest modes and muscular relaxation with stressful stimulus. In this technique, a physiological status is created to avoid anxiety and stress in patients. Then, such status is accompanied with a weak stressful stimulus and such accompaniment is repeated until the stimulus loses its stressful trait. Resultantly, stronger stimuli are regularly accompanied by physiological states opposed with stress [6].

Behavioral-cognitive methods may be able to reduce dental fear and stress level of individuals. Many patients avoid seeking dental care due to high level of dental fear and stress. Evidence shows that 45% of people worldwide have dental fear, which can compromise their oral health [7-9]. Therefore, this study aimed to assess the effect of emotional self-regulation strategies and systematic desensitization on stress level of adult dental patients.

Materials and Methods

This clinical trial was approved by the Ethics Committee of the Faculty of Dentistry of Islamic Azad University (IR.IAU.TABRIZ.REC.1401.044). Also, it was registered in the Iranian Registry of Clinical

Trials (IRCT20220717055481N1). The study population consisted of adults seeking dental care who were referred to a dental office in 2019; 40 patients with stress signs were selected by purposeful sampling [10]. For this purpose, the patients were asked to fill out a stress questionnaire, and 40 patients who acquired a score higher than the mean total score, and met the eligibility criteria were enrolled. The inclusion criteria were age over 20 years and having dental problems that required dental interventions. The exclusion criteria were unwillingness to participate or remain in the study, failure to answer or incomplete answers to pre-test and post-test questions, and having psychological and neurological disorders such as Alzheimer's disease, dementia, or depression.

The patients were then classified into two groups (n=20) of emotional self-regulation and systematic desensitization group. To quantify the dental stress of participants, the Children's Fear Survey Schedule - Dental Subscale and adults (CFSS-DS) by Cuthbert and Melamed [11] was used, which is a standard questionnaire. It measures stress in all dental situations through 15 items. It was scored based on a 5-point Likert scale ranging from very low to very much (1 to 5), and the total score of each patient ranged from 15 to 75. Scores equal or more than 38 showed dental stress. Reliability and validity of this scale were confirmed by Zimmerman[12] to be 0.85 and 0.90, respectively, by examining 30 participants twice with a 4-week interval. Safari et al. [10] calculated the reliability and validity of the Persian version of this scale to be 0.70 and 0.80, respectively, in an Iranian population. Its reliability was calculated to be 0.83 using the Cronbach's alpha, and its content validity was ensured through confirmation by psychological and educational experts.

Procedure:

In the first step, 80 dental patients were randomly selected and after obtaining their written informed consent, the scales of fear and anxiety were distributed among them. In

the next step, individuals were classified into two groups as explained earlier. An informatory session was held for groups 1 and 2. For each method of desensitization and emotional self-regulation, the sessions were held in groups such that the participants could practice in a social setting (Tables 1 and 2). In addition, they could receive a feedback from

the group members as such. Two groups received 8 sessions, each session for 1.5 hours, once a week, for 2 months.

In this study, t-test was used for comparison of two experimental groups and paired t-test was used to analyses before and after of each group.

Table 1. Program sessions for emotional self-regulation group

Phase	Objective	Emotional Regulation Techniques
Situation Selection (1)	Increasing awareness through emotional education	a. Understanding the emotion and motivating situations b. self-evaluation to understand his/her emotion experiences c. self-evaluation to understand his/her emotion vulnerability d. self-evaluation to understand his/her emotion regulating strategies
Situation Modification (2)	Changing the emotion motivating situations	a. Avoiding of social isolation b. Instructing the problem-solving c. Instructing interpersonal skills (Dialogue, expression and conflict resolution)
Expanding Attention (3)	Changing attention	a. Stopping rumination b. Instructing distraction
Cognitive Changes (4)	Changing the cognitive evaluations	a. Identifying incorrect evaluations and their effect on emotional status b. Instructing re-evaluation strategy
Response Adjustment (5)	Changing the behavioral and physiological outcomes of emotions	a. Identifying level and how to use of inhibition strategy and considering its emotional outcomes b. Facing with emotion motive c. Instructing emotion expression d. Modifying the behavior through changing the setting enhancers e. Emotional discharge instructing, relaxation, reverse action

Table 2. Program sessions for the desensitization group

Session	Phase	Subject
1	1	Initial communication. Describing, introducing the group members to each other, explaining therapy and its phases for visitors
	2	Providing suitable and well setting for relaxation
2	3	Instructing muscles relaxation, muscles instructing in 14 groups of muscles
	1-3	Hand and wrist, front arms, head, mouth, lip, nose, neck, abdominal, hip, thigh, foot wrist and fingers
3	2-3	Muscles instructing in six groups of muscles (dominant arm of the hand, non-dominant arm of hand, faces, neck, abdominal and foot)
	3-3	Muscles Instruction in three groups of muscles (each arm of hand, body center and both of feet)
4	3-4	Remembering and Repeating three groups of muscles
	4	Providing hierarchy of anxiety from dentistry
5	1-4	Providing five motives of hierarchy of anxiety from dentistry
6	2-4	Providing ten motives of hierarchy of anxiety from dentistry
7	3-4	Providing fifteen motives of hierarchy of anxiety from dentistry
8	3-5	Providing eighteen motives of hierarchy of anxiety from dentistry and implementing regular desensitization

Results

In this study, 40 patients were evaluated with a mean age of 34.5 ± 4.2 years old. The pretest score was 52.10 ± 9.69 for two groups, which decreased by emotional self-regulation and systematic desensitization instructions to 43.50 ± 7.42 and 43.80 ± 7.61 , respectively (Table 3). Independent t-test showed no significant difference between the efficacy of the two modalities ($P > 0.05$).

Comparison of pretest and post-test stress

scores in the emotional self-regulation group showed that a significant reduction occurred in stress score after the intervention and emotional self-regulation decreased stress by 44% ($P < 0.001$).

Comparison of pretest and post-test stress scores in systematic desensitization group showed that the mean stress score significantly decreased after the intervention and systematic desensitization decreased stress by 52% ($P < 0.001$).

Table 3. Means stress scores of adults in the two groups (n=20)

Group	Pre-Test Mean (SD)	Post-Test Mean (SD)	Corrected Mean
Self-regulation group	52.10 (9.69)	43.500 (7.42)	42.12
Systematic desensitization group	52.10 (9.69)	43.80 (7.61)	44.09

Discussion

The objective of this study was to compare the effect of emotional self-regulation and systematic desensitization on dental stress of dental patients. The results showed that emotional self-regulation significantly decreased dental stress of patients. Evidence shows that learning emotional self-regulation strategies can significantly decrease stress level of patients [13-15]. Gross showed that participants who were encouraged to use emotional self-regulation successfully decreased their emotional behavior. Furthermore, emotional self-regulation could reduce subjective experience of negative emotions without increasing sympathetic arousal [13]. Consequently, it seems that regulating emotions could have desirable outcomes in treatment of emotional problems, and particularly stress and anxiety [16]. The present results confirmed this statement. Furthermore, when individuals repeatedly practice emotional self-regulation strategies, it forms a habit [14]. Stress management skills can affect anxiety and stress symptoms.

Emotional self-regulation instruction could reduce stress and even cholesterol and triglycerides [4]. It could affect physical and mental health as well. Dental stress is a type of physiological stress rather than a psychological stress. Therefore, emotional self-regulation strategies can have positive impact on dental stress and anxiety.

Furthermore, the present results showed that systematic desensitization affected dental stress of adult dental patients. Systematic desensitization is among the easiest methods to control behavioral stress. This method addresses the physiological and cognitive aspects of stress reduction. Simultaneous use of muscle relaxation and visualization of stressful scenes during systematic desensitization could inhibit automatic sympathetic arousals and provide a new response to counterconditioning by setting stressful stimuli. In systematic desensitization, individuals were instructed to relax their muscles by creating tension and relaxation in different groups of muscles consciously.

Then, they are faced with stress hierarchy from low to high levels. Desensitization could be done in a treatment setting and then practiced in actual stressful settings and situations by the generalization method. Even if the relaxation response acts as a mental preoccupation, it could help individuals cope with their stress, and reduce their avoidance behaviors and lack of motivation. It helps them reduce their dental stress through systematic desensitization. Our results in this regard were consistent with the findings of previous studies [17-23].

In addition, the results showed that both emotional self-regulation strategies and systematic desensitization reduced stress level of dental patients. Emotional self-regulation was slightly more effective than systematic desensitization in the present study but the difference did not reach statistical significance. Patients had higher awareness in emotional self-regulation setting and therefore, it was easy for them to identify stressful situations and thus emotional self-regulation strategy rapidly decreased their stress level.

One limitation of this study was its sampling method, which was purposeful sampling. Therefore, care should be taken in generalizing the results. COVID-19 pandemic was another limitation, which decreased the sample size. Future studies on other therapeutic models are required.

Conclusion

Both emotional self-regulation and systematic desensitization were equally successful in decreasing the stress level of dental patients.

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