

METHODS TO REDUCE ANXIETY APPLIED IN THE PEDODONTIC PRACTICE

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ABSTRACT

Aim of the study The aim of the present study is to compare the effects of two relaxation techniques widely used in psychotherapy on anxious child patients. **Material and methods** We investigated a sample consisting of 56 anxious minor patients with odontal problems. First, we determined children's anxiety levels by using the questionnaire method and biological parameters measurements. Spielberger's State-Trait Anxiety Inventory was the questionnaire patients had to fill in and pulse and blood pressure were the measured biological parameters. High anxiety levels demonstrated by our patients were then reduced by using two relaxation techniques both belonging to cognitive-behavioural psychotherapy. We determined and compared the effects of those techniques on children's anxiety by statistical means. **Results** Jacobson's Progressive Relaxation Technique proved to be more effective. It is very useful for the dentist to know and apply relaxation techniques to reduce anxiety which is a common problem in the pedodontic practice.

Keywords: anxiety, relaxation technique, pedodontics

INTRODUCTION

Anxiety is defined as "an irrational fear with an unknown and unexplained motivation without being caused by biological or psychiatric disorders" [1].

This emotional state cannot be controlled by the individual, as it is acute or chronic, diffuse and continuous. Anxiety disorders are described as first in the frequency of mental disorders, with a prevalence of 25% during lifetime. Only 25% of anxiety disorder cases are detected and treated on time [2].

In case of children, fears are part of the normal psychological development having the role of helping them to deal with stress and anxiety as adults. They do not interfere with normal development of the child, are transient and occur at certain ages. Hiding phobias can

lead over time to depression, failure, inhibition, poor education outcomes. Teenage undetected and untreated phobias' consequences can lead to impaired self-image, worsening relations with friends and colleagues, school absenteeism, consumption of cigarettes, alcohol and drugs [3].

In a specific phobia, like the dental phobia, child's attitude can be awareness of its absurd character with the onset of assertive behavior, dependence or rejection and denial with an attitude of bravado [1]. These reactions affect the doctor-patient collaboration and even the addressability of the child for the dental treatment.

The patient is often aware that he/she is not facing a real threat, but nevertheless cannot control his/her feelings [4]. There are

lots of young patients who have had painful experiences in the dental office and manifest fear of the dentist and the dental treatment, triggered even by the specific sounds or odors. The dentist has to fight the patient's fear and to reshape his/her feelings and behavior.

We have to be very careful when dealing with children because they are very responsive to non-verbal messages. So, being also very susceptible because of anxiety and pain, the child could easily notice the dentist's hastiness, bad mood or professional incompetence.

Communication between dentist and patient is essential for the treatment's success. So, the doctor has to use simple, non-technical words, short and clear sentences. The instructions have to be repeated if necessary. The young patient has to be stimulated to speak with the dentist. By encouraging their conversation, the patient reveals personal thoughts and fears which help the dentist to understand the child's mental state.

Cognitive-behavioral therapy's methods proved to be useful to combat anxiety. These techniques combine cognitive restructuring with behavioral changes, teaching the individuals new ways to face stress and anxiety [5]. This modern type of psychotherapy is built on the concept that "how we think determines how we feel and how we feel determines how we behave" [5].

The patient with behavior problems due to the excessive state anxiety is helped by the doctor to find his/her own wrong ways of thinking. Then, the patient is taught how to change these "irrational beliefs" in rational and positive ones. Changes in the way of thinking lead to decrease of anxiety then to behavior improvements.

Relaxation techniques belong to this psychotherapy's methods widely used in dealing with anxiety in children and

adolescents [6, 7, 8].

MATERIAL AND METHODS

In psychological research Spielberg developed the State-Trait Anxiety Inventory (STAI) which investigates the two forms of anxiety - anxiety as a state and anxiety as a trait. This questionnaire has been validated by many studies [9]. In our study we used the Romanian version of the State-Trait Anxiety Inventory (STAI). State anxiety is defined as "a transitory emotional condition that varies in intensity and fluctuates over time" whereas "trait anxiety is a personality trait that remains relatively stable" [10]. STAI consists of two scales of 20 questions designed to measure the two anxiety forms - A-state and A-trait [10]. Each scale's score ranges from 20 to 80.

State anxiety's normal values are 41.39 with a standard deviation of 8.30 in women and 40.38 with a standard deviation of 7.21 in men. Trait anxiety's normal values are 42.11 with a standard deviation of 7.04 in women and 40.16 with a standard deviation of 8.33 in men [11].

A-state is useful in determining anxiety's values in certain situations like the dental treatment in our study. This parameter's values are getting higher in stressful conditions and lower after using relaxation techniques [12]. High values of A-trait will bring increases of A-state more often because these persons have a great tendency to consider a situation as dangerous.

The Autonomic Nervous System expands its activity during stressful conditions; consequently heart rate, pulse and blood pressure increase [13]. Other physiological changes caused by anxiety are: dyspnea, abdominal cramps, nausea, restlessness, frequent urination, headache, sweating [13].

The first applied relaxation method was "Breathing Control Technique". This technique is meant to induce the relaxation of

the whole body and to bring to normal values the physiological parameters which were increased by the state of anxiety. By adjusting respiration this technique combats hyperventilation that appears in anxiety situations as a consequence of the accelerated chest breathing. Hyperventilation causes the decrease of the carbon dioxide's concentration in the blood and this may lead to panic attack symptoms [14].

During the Breathing Control Technique the patient is instructed to breathe slow, deep or diaphragmatic, with a constant rate and without interruptions for several minutes. This kind of breathing lets fuller oxygen exchange. The effects are blood pressure and pulse decrease. Inhalation has to be nasal not oral, with a duration of 3-4 seconds and exhalation could be nasal or oral, lasting for 4 seconds [5].

The adequate dental chair position for Breathing Technique is: spine entirely supported, feet uncrossed, arms relaxed with hands set in the lap, shoulders down allowing breathing. We can use soft music to enhance relaxation; the melody should be calm and repetitive.

The second technique applied was "Jacobson's Progressive Relaxation Technique". This is a multi-step cognitive-behavioural technique which consists in a series of muscle groups contractions followed by relaxations. Tensing for 7-10 seconds a muscle then releasing it for 15-20 seconds induce a deep muscle relaxation. Making these exercises throughout the body induces a deep relaxation which is very useful in relieving anxiety [15].

Muscle exercises begin with the upper groups, from head to toes. Jacobson's Technique general steps are:

- Focus of attention on different muscle groups being aware of the difference between muscle tension and relaxation;
- Stretch the muscle group for 7-10 seconds;

- Relax the muscle group with awareness of relaxation for 15-20 seconds;
- The patient is taught to recognize the feeling of muscle relaxation in order to reproduce it when necessary.

This technique will require 20/30 minutes when it is applied for the first time [16].

In order to investigate the two techniques' effects on reducing anxiety in pedodontic treatments we formulated the following hypothesis:

We suppose that Jacobson's Progressive Relaxation Technique is more efficient in reducing patient's anxiety than Breathing Control Technique.

Our sample of subjects consists of 56 subjects, girls and boys aged between 10 and 17. The mean of the sample was 14.5 with a standard deviation of 2.67.

Research variables were:

1. State anxiety expressed by A-state score
2. Trait anxiety expressed by A-trait score
3. Systolic blood pressure
4. Diastolic blood pressure
5. Pulse

Working procedure was the same in any patient.

At the beginning of the treatment we made a clinical examination of the young patient. Then, we began to treat a simple decay without using local anaesthesia. During the drilling of the dental cavity, we made a break and we asked the patient to fill in Spielberger's State-Trait Anxiety Inventory. Then, we determined the values of blood pressure and pulse using a digital device.

We applied Breathing Control Technique for five minutes. After that we determined again state anxiety, trait anxiety, blood pressure and pulse.

Then, we continued our dentist work on preparation of the dental cavity and after several minutes we stopped again and applied Jacobson's Progressive Relaxation Technique; after that we determined again

state anxiety, trait anxiety, blood pressure and pulse.

RESULTS AND DISCUSSIONS

We compared by statistical means, using Student test, the two techniques' effects on the patient's anxiety by investigating the changes in research variables.

1. State anxiety originally had a mean of 62.75 with a standard deviation of 4.16 which demonstrates high anxiety values. After the application of Breathing Control Technique the mean decreased to 55.25 with a standard deviation of 3.69. The probability $p=0.049$ less than the predetermined $p=0.05$ indicates that this technique's application decreased state anxiety.

After applying Jacobson's Progressive Relaxation Technique the mean fell more to the value of 47.12 with a standard deviation of 1.95. Probability $p=0.001$ considerably less than in the first case shows a greater effectiveness of this technique in the decrease of state anxiety which was demonstrated even by other studies [17].

2. Trait anxiety had at the beginning a mean of 39.75 with a standard deviation of which is a normal value. After the application of the first technique the mean decreased at 38.25 with a SD of 3.69, $p=0.46$ and after the second the mean fell down more to 35.37 with a SD of 3.54, $p=0.041$. P-values show that both techniques were efficient in trait anxiety's decrease but Jacobson's Progressive

Relaxation was much more effective than Breathing Control.

3. Systolic blood pressure's mean which initially was 133 mmHg with a SD of 5.34 decreased to a mean of 121.75 mmHg with a SD of 7.12 and a $p=0.003$ after applying Breathing Control Technique and more to a mean of 109.25 mmHg with a SD of 6.58 and a p -value <0.0001 after Jacobson's one. These statistical results show that both techniques had a great effectiveness in decreasing systolic blood pressure's values but Jacobson's Progressive Relaxation proved better results than Breathing Control.

4. Diastolic blood pressure originally had a mean of 83 mmHg with a SD of 4.53. The mean decreased to 76.75 mmHg with a SD of 3.99 after the first technique and at 74 mmHg with a SD of 4.27 after the second. P-values <0.0001 in each application showed that both psychological techniques had a great effectiveness in decreasing diastolic blood pressure.

5. Pulse had at the beginning a mean of 92.75 which is a great value, with a SD of 4.65. The mean decreased at 84 with a SD of 4.40 and $p=0.001$ after applying Breathing Control Technique and more at a mean of 74 with a SD of 4.27 and p -value <0.0001 after Jacobson's Technique. These statistical results show that both techniques had a great effectiveness in decreasing pulse but Jacobson's Progressive Relaxation had better results.

Table 1. Values of the mean and standard deviation of our study

	Mean	Standard deviation	p
A-state initial	62,75	4,1662	
A-state BC	55,25	3,6936	0,049
A-state JPR	47,125	1,9594	<0.0001
A-trait initial	39,75	4,2342	
A-trait BC	38,25	3,6936	0,462
A-trait JPR	35,375	3,5431	0,041
SYS initial	133	5,3452	

	Mean	Standard deviation	p
DIA initial	90,5	3,9641	
SYS BC	121,75	7,1264	0,003
DIA BC	83	4,5356	0,0033
SYS JPR	109,25	6,5846	<0.0001
DIA JPR	76,75	3,9911	<0.0001
Pulse initial	92,75	4,6522	
Pulse BC	84	4,4078	0,0017
Pulse JPR	74	4,2762	<0.0001

CONCLUSIONS

1. Both Breathing Control Technique and Jacobson's Progressive Relaxation Technique are efficient in decreasing state and trait anxiety's values but the second one demonstrates a greater effectiveness than the first one.
2. Both psychological techniques used are very effective in decreasing blood pressure's values but Jacobson's Technique proves better results than Breathing Control Technique in decreasing systolic blood pressure.
3. Both techniques have a great effectiveness in decreasing pulse but Jacobson's Progressive Relaxation has better results.
4. By this study we demonstrated that our hypothesis that Jacobson's Progressive Relaxation Technique is more efficient in reducing young patients' anxiety than Breathing Control Technique is valid.
5. It is very useful for the dentist to learn, to know and to apply Jacobson's Progressive Relaxation Technique in order to reduce anxiety which is a common problem in the pedodontic practice.

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