

# Research Journal of Pharmaceutical, Biological and Chemical Sciences

## The Effect of Relaxing Music on Perioperative Stress Control.

Gordana Apostolova<sup>1</sup>, Elena Velkoska<sup>1\*</sup>, Blerta Zekiri<sup>1</sup>, Denis Baftijari<sup>3</sup>,  
Andrijana Gavazova<sup>2</sup>, Jovan Strkovski<sup>2</sup>, and Filip Koneski<sup>1</sup>.

<sup>1</sup>Department of oral surgery and implantology, Faculty of Dentistry in Skopje, Ss Cyril and Methodius University, R. Macedonia

<sup>2</sup>Undergraduated student in dentistry, Faculty of Dentistry in Skopje, Ss Cyril and Methodius University, R. Macedonia

<sup>3</sup>DMD, Postgraduate student in dentistry, Resident, Department of maxillofacial surgery, Faculty of Dentistry in Skopje, Ss Cyril and Methodius University, R. Macedonia

### ABSTRACT

Oral surgery procedures causes fear and anxiety in patients, which is a common cause of avoidance of dental practices. Fear of pain or sound from dental micromotors are the most common causes that patients refer as anxiety factors. In order to reduce anxiety, dentists apply different methods such as sedatives, hypnosis or music. Music is widely accepted for its action against anxiety at the psychological level complemented by an analgesic effect. The aim of this study is to trace the effect of stress relaxing music on anxiety and fear in patients before and during oral surgery procedures. In the study 35 respondents were included, divided into two groups, an examined group, where patients listened to relaxing music( before and during an intervention) and a control group without music. The results indicate a positive impact of music on fear and anxiety in patients during the perioperative period.

**Keywords:** relaxing music, stress control, dental anxiety

*\*Corresponding author*

## INTRODUCTION

Visiting a dentist to most patients causes fear and anxiety. Many support the theses that pain and fear from pain is a common phenomenon in the dental clinics and a primary cause for avoiding the same. Fear of pain, fear of needles or watching blood, the possibility of getting allergic reaction, the sound of doctors micromotors, painful experiences from the past or stories from others, are the most common reasons that the patients line up as factors of occurring this anxiety(1).

Avoiding visiting a dentist inevitably leads to complications in healing the indisposed oral tissues, causing functional, esthetic and social consequences(2).

The concept, fear from the dentist" is defined in three levels(3):

- Dental anxiety-the lowest rate of fear from the dentist. That is a state of anxiety that something bad is about to happen while a dental intervention is in progress and in most cases is unreasonable.
- Dental fear-that is the common answer of a hazard because it appears at people who already had bad experience in dental clinic and expect that to happen inevitably.
- Dental phobia -that is the most common shape of fear from the dentist. The diagnose is defined by psychiatrists and psychologists as a mental disturbance that embeds expressive fear or avoiding a certain object or a situation that causes larger emotional stress.

Regarding the fear from dental interventions, very often can be seen psychic reactions with somatic changes of palpitation, tachycardia, hypertension type, a stressful state or stomach disturbance, the feeling of lack of oxygen, anxiety and shivering(4).

Dentist in most cases are striving to gain trust from the patient, informing them very precise regarding the dental intervention not concealing anything(5). A problem plus appears to be the way the information is given for the curiosity of the patient, like magazines on the internet, that might cause additional negative consequences.

The therapist begins with a conversation with the patient by encouraging and by explaining the inevitability of the dental intervention.

If the conversation does not reduce the fear on further steps are used several techniques of reducing anxiety like distraction, relaxing music all the way to using sedatives as well as hypnosis. The „say, show-do" technique is the most used in dentistry thus is the way of taking over the treatment. While an intervention in progress it is necessary for breaks if the patient demands that reduces the tension(6). It would be useful for a deal among the dentist and the patient for the sing giving system, if it is necessary to stop the intervention in a case of pain or other symptom. One of the most used methods, effective and well embraced is the music that kills the anxiety with its psychological and analgesic effect. The music is used for distraction of the patient from the harmful stimulations mentioned above, at the same time creating relaxing feeling on the dental chair. It is recommended repeatable rhythm, predictable dynamics, harmoniously sound, meditating or relaxing music(7).

## AIM

Guided by the literature findings we came up to an idea to elaborate an original work in which we study the effect of relaxing music stress over the anxiety and fear at patients before the beginning and during the dental intervention. As a conversion we set up the following aims of research:

- To follow the level of anxiety of the patient that were appointed for a oral surgery intervention.
- Objective somatic parameters to be observed (blood pressure, speeding pulse, number of respirations) and their relay to relaxing music.
- Through a questionnaire to get subjective information from the patient during the intervention and the eventual influence of music in reducing fear.

## MATERIALS AND METHODS

In achieving the given goals we elaborated a clinical study in the Oral Surgery Department at Dental Faculty at UKIM in Skopje. In the research 35 respondents were included divided in two groups, the examined group with 20 respondents and control group 15 respondents.

In the appointed schedule for operative intervention, every respondent was comfortably settled on the dental chair in the intervention chamber. The respondents of the first group were alone for 10 minutes where they listened a stress relaxing music made from a cell speaker JBL GO.

The respondents from the control group also were left alone in a period of ten minutes but in silence, no music playing.

The research proceeded by fulfilling the scale of anxiety, measuring the blood pressure and pulse on digital device and marking the number of respirations in a minute from two investigators. After completing the operative intervention the necessary parameters were made (blood pressure, pulse, number of respirations) as well as fulfilling the second part of the questionnaire for a subjective mark of the operating intervention.

The questionnaires of all respondents were neatly filled and ready for a statistic elaboration in the program SPSS Statistics v.21.

## RESULTS AND DISCUSSION

The technological progress in the modern dentistry reduces but does not impedes the anxiety regarding the healing of teeth and the fear related to it. Although the oral surgery interventions of operative extraction type on impact teeth, apicotomy and cystectomy are less oral surgery procedures, rarely life hazard, with a relative short period of recovering, nevertheless the experience of the patients is stressful more before the intervention(8,9,10)

The music therapy is widely used method which is very effective and embraced for rehabilitation of the patients who suffer a physic, mental or emotional disturbance. The music affects the recipient through the hearing sense (11,12) and fights the anxiety with its triple influence:

- Works as anxiolytic/relaxing effect
- Distraction (mostly partly) on the patient attention from the dental procedure that causes discomfort
- Direct analgesic effect ( supported from the intracerebral endorphin release)

Objective, the music effect is observed through:

- slowing down the pulse
- reducing the blood pressure
- reducing the amount of stress hormone
- deepens the inhaling
- Speeds the serotonin production (joyful hormone)
- Influences the brain waves (if the rhythm of the music is fast the concentration and the alertness, whilst if the rhythm is slow we reach peaceful and meditating state).

In our elaboration to all 35 respondents (13 males and 22 females) the anxiety was observed before the operating intervention by using the so called Amsterdam Scale (modified) in which the anxiety is shown with numbers from 1 to 5. The number is a middle value from the numerous information obtained from the questions (Table 1).

**Table 1: Modified scale for determining anxiety (from general to plenty)**

Fear of anesthesia	1	2	3	4	5
Fear of intervention (machine work, pain or complication occurring)	1	2	3	4	5
Information regarding the intervention: satisfactory/unsatisfactory	1	2	3	4	5
<b>Medium value of the anxiety</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

**Table 2: Showing the height of anxiety per group**

Anxiety			
group	N	Mean Rank	Sum of Ranks
1,00 K	14	20,18	282,50
2,00 E	21	16,55	347,50
Total	35		

**Table 3: Mann Whitney U test**

	Anxiety
Mann-Whitney U	116,500
Wilcoxon W	347,500
Z	(1,067)
Asymp. Sig. (2-tailed)	0,286
Exact Sig. [2*(1-tailed Sig.)]	<b>0,309<sup>b</sup></b>

Table 2 and 3 show our results regarding the anxiety of the interrogated and control group. According to the Mann Whitney U test the obtained value from 0.309 shows that there is not any significant difference of anxiety between the two groups before the operating intervention. The numeral value of anxiety in the groups is between 3 and 3.5.

**Table 4: Values of the blood pressure and the number of respirations at the respondents from both groups before and after the intervention (T-paired samples test, for  $p > 0.05$  there aren't many differences in the examination parameters in both groups)**

	Paired differences	t	df	Sig.(2-tailed)	
					95% confidence interval of difference
					upper
Pair 1 Systolic BP before 1 Systolic BP after 1	10.73484	(.809)	13	0,433	
Pair 2 Systolic BP before 2 Systolic BP after 2	15.06258	1,418	20	0,172	
Pair 3 Diastolic BP before 1 Diastolic BP after 1	11.74428	2,202	13	0,06	
Pair 4 Diastolic BP before 2 Diastolic BP after 2	10.41162	1,301	20	0,208	
Pair 5 Respirations before 1 Respirations after 1	1.69728	1,096	13	0,293	
Pair 6 Respirations before 2 Respirations after 2	2.68170	1,549	20	0,137	

On Table 4 are shown the values of vital parameters (blood pressure and number of respirations) before and after the intervention. The results doesn't show any significant difference between the groups concerning these two parameters. In both, respondents groups are healthy and with normal blood pressure, while the psychic stress before the intervention does not influence on inclining the values, as well as the operating stress. Regarding the number of respirations, the value does not change in the control group. Changes are seen in the examined group where we observe a reduction of the number of respirations, but don't have any statistic significance.

**Table 5: The values of the pulse parameter at the respondents from the examined group before and after the intervention(T- Paired samples test - for  $p < 0.05$  there is a significant difference in the values of the pulse parameter, before and after the intervention).**

	Paired Differences			
	mean	Std deviation	Std error mean	95% Confidence Interval of the difference
	lower			
Pair 1 pulse before 2 pulse after 2	11.57143	13,64394	2,97735	5,36078

	Paired Differences	t	Df	Sig.(2-tailed)
	95% Confidence Interval of the difference			
	Upper			
Pair 1 pulse before 2 pulse after 2	17,78208	3,886	20	<b>0,001</b>

On table 5 are shown the values of the pulse parameter in both examined groups. Differing from the above mentioned parameters, the data analysis has showed a significant difference between the pulse values before and after the intervention in the examined group that that was listened relaxing music ( $p=0.001$ ). Observing these results we can conclude that music as a relaxing factor affected the pulse parameter at examined patients, the same reduces after the intervention.

Our findings correlate to the findings from Iorgulescu<sup>13</sup> and Beckhuis<sup>12</sup> who showed that music has a peaceful effect at patients with high anxiety. Khalifa et al.<sup>14</sup> concluded that this impact is more exposed at female patients, which is not the case in our investigation.

Our findings do not match with the findings made by Atiken et al.<sup>15</sup> according to whom music doesn't have any influence on perioperative anxiety and perioperative stress. Apparently that difference is a reference that in their thesis the investigations are made over youngsters, differing from our research, that leads to the fact that we should apply other methods of relaxation at younger age before the intervention. Correlation to every parameter apart by gender and age of the respondents does not show any significant difference.

The second part of the questionnaire in our study contains data for the subjective perception of operative intervention (table 6). Examined group during the intervention listened to the music that played in

the operative block as a relaxing factor. The data obtained from the questionnaires suggest the fact that music fights the sound of dental machine, but not the conversation between the personnel in the chamber.

Data in the control group show that the patient attention was focused to the personnel conversation and sound of dental machine.

**Table 6: Subjective perception on the operative intervention**

Do you feel pain	yes	no
Do you hear the sound of the machine?	yes	no
Do you hear the music?	yes	no
Do you hear the personnel conversation	yes	no

The same results were acknowledged by Thoma et al.<sup>16</sup> showing no fear from the dental micromotor when patient are exposed to relaxing music.

All results shown and the analysis of literature data (8,17) show us that music as a nonpharmacologic method can be of a great use before and after the operative interventions with a goal of fear reduction at patients, reducing pain and depression or bucking up mood (15). If we follow up the expenses for avoiding pharmacologic preparations, then the use of music in the routine dentist practice seems to be very reasonable

### CONCLUSION

The obtained results point to the positive effect of music over fear and anxiety of patients in the perioperative period, actually anxiety is less present during the interventions when the stress relaxing music is on. Patients declare a peaceful state during the intervention, calmness and comfort, optimism and relaxation.

Music can be additional complementary method for reducing anxiety in dental interventions.

### REFERENCES

- [1] Moore R, Brodsgaard I. Community Dent Oral Epidemiol. 2001;29(1):73–80
- [2] Pritchard MJ. Nursing Standard 23.51,2009; 35-40.
- [3] Medojevic MJ.,Neskovic J., Medojevic A. Serbian Dental Journal,2015; 62(4):174-183
- [4] Oosterink FM, De Jongh A, Aartman IH. Eur J Oral Sci. 2008;116(1):44–51
- [5] Stępień K., Walczak M.,Kobyłański J., Bereziewicz W. MEDtube Science,2014; 2(2): 21-9.
- [6] Hanser S. Best Practice: evidence-based information sheets for health professionals, 2011;15(2):1-4
- [7] Jonson S., Chapman K., Huebner G. Anesth Prog.1984;31(4):165-69
- [8] Appukuttan DP. Literature review,2016;8:35-50
- [9] Freeman R. British Dental Journal. 1999; 187(2):81–4
- [10] Wong M, Lytle WR. J Endod1991;17(9):461-5.
- [11] Mattei TA, Rodriguez AH. OA Evidence-Based Medicine ,2013 ;1(1):2.
- [12] Bekhuis T. J Evid Based Dent Pract,2009;9(4):213-4
- [13] Iorgulescu G. International Journal of Music and Performing Arts.2015;2(3):19-24
- [14] Khalfa S, Bella SD, Roy M, Peretz I, Lupien SJ. AnnNYAcad Sci, 2003; 999: 374-6.
- [15] Aitken JC., Wilson S.,Pediatric Dentistry,2002;24(2):114-8
- [16] Thoma VM., La Marca R., Brönnimann R., Linda Finkel L., Ulrike Ehlert U. and Urs M. Nater UM.PLoS One, 2013; 8(8): e70156.
- [17] Parveen AL., Mohan S., Varun S. IOSR Journal of Dental and Medical Sciences,2015;14(7):96-101