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COMPARISON OF THE EFFECT OF MUSIC THERAPY AND IATROSEDATION ON DENTAL ANXIETY DURING EXTRACTION.

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ABSTRACT **INTRODUCTION:** Dental anxiety is considered to be one of the main challenges faced by patients, which prevents them from receiving quality dental care. This study aims at comparing the effect of music therapy and iatrosedation on dental anxiety in the same patient, using subjective and objective methods of evaluation.

MATERIALS AND METHODS: This study is a clinical trial conducted on 25 subjects indicated for multiple quadrant extraction. Patients were given a questionnaire preoperatively and postoperatively along with recording their blood pressure, heart rate and oxygen saturation. Music therapy and iatrosedation were used to control the patients' anxiety.

RESULTS: IBM SPSS Version 20.0 was used to analyze the results. There was a mean increase in systolic blood pressure and heart rate postoperatively after music therapy and iatrosedation. There was a mean decrease in diastolic blood pressure after using music therapy and iatrosedation and a mean increase in oxygen saturation in both cases. The subjective evaluation showed better patient satisfaction when music therapy was used.

DISCUSSION: The increase in the systolic blood pressure and heart rate is attributed to the effect of adrenaline which was administered through local anaesthesia. The decrease in diastolic blood pressure was better in music therapy compared to iatrosedation and similarly, the increase in oxygen saturation was better in music therapy compared to iatrosedation. The subjective evaluation resulted in better patient satisfaction through music therapy, which concludes that music therapy plays a better role compared to iatrosedation in reducing patient dental anxiety during extraction.

KEYWORDS : Dental fear, Anxiety, Pain, Anesthesia, Oral and Maxillofacial surgery, Neurophysiology

INTRODUCTION

Over the decades, although there have been many advances in the clinical practice of dentistry to benefit the patients, dental anxiety remained to be a significant challenge suffered by patients and dentists which prevents them from receiving the quality dental care.[1]

Milgrom et al at the University of Washington, identified "Seattle system", on the basis of origin or source of the fear of anxious patients as follows: 1. Anxious of the specific dental stimuli, 2. Distrust of the dental personnel, 3. dental anxiety, 4. Anxious of catastrophe.[2,3] Identifying the cause of fear will benefit us in our approach to treat anxious patients. The very first interaction of the dentist and the patient can reveal the presence of anxiety and fear. In such situations, subjective and objective evaluations can greatly enhance the diagnosis for successful management.[4] Subjective measures include asking few open-ended questions to guide the conversation in the desired direction and anxiety questionnaires among which Corah Dental Anxiety Scale, Modified Dental Anxiety Scale and Dental Fear Scale are the most commonly used ones.[4] Blood pressure, pulse rate, pulse oximetry, galvanic skin response, finger temperature are the various objective measures to identify dental anxious patients.[5]

As the etiology of dental anxiety is multifactorial, different methods have been employed to reduce the, broadly classified as:

1. Pharmacological
2. Non-pharmacological

The pharmacological approach includes general anaesthesia and sedation but there are some factors which are to be considered before a patient can be subjected to it such as proper equipment and monitoring and cost etc.[4]

The non-pharmacological approach includes cognitive, behavioural and cognitive-behavioural therapies.[6]

- The cognitive approach includes education, cognitive restructuring,[7] group therapy[8] and positive dental experience.[9]
- Behavioural therapies include systematic desensitization, brief relaxation, musical distraction[10] and hypnosis.[8]
- Cognitive-behavioural therapy combines both techniques.

Music plays an important role in manipulating our emotions. Our body has a tendency to move to the rhythm and it is seen in everyone, including infants. Mothers around the world have used lullabies and rhythmic rocking to calm crying babies. Music precedes language and brains are wired to respond to music. Sometimes, flowing rhythm and lyrics is all that one needs to ease the pain and music therapy works on this belief.

Music therapy exists in both active and passive forms where active music therapy is performed by specially trained therapists and passive is performed by playing pre-recorded music without the presence of any music therapist.[11,12]

There are many evidence-based reports stating the antalgic effect of music, based on the intracerebral issuing of endorphins and also the distraction effect of music which causes distraction from painful stimuli, based on gate theory.[13] Dr Gabriela Iorgulescu in his article stated that the analgesic and anxiolytic effect of music is superior to the pharmacological method of management which involves risks such as allergies and adverse effects in contrast to music intervention.[13] Playing a selected and appropriate music for an effective treatment that reflects their culture and personal identity makes the entire treatment a more personalized and individualized experience. Iatrosedation was described by Friedman and colleagues as a step by step process of calming the patient by dentists' attitude, behaviour and communication.[14]

The present study was aimed at comparing the effect of music therapy and iatrosedation on dental anxiety in the same patient, using subjective and objective methods of evaluation such as a modified version of modified dental anxiety scale, blood pressure, heart rate and oxygen saturation.

MATERIALS AND METHODS:

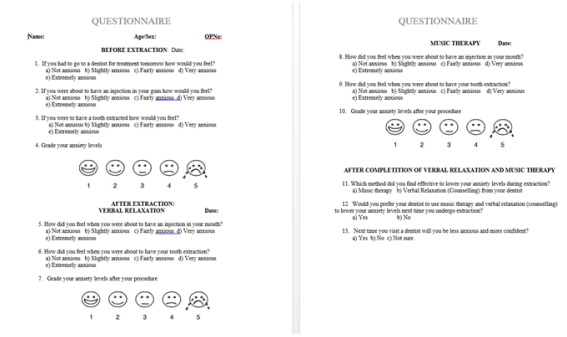
25 subjects attending the department of Oral and Maxillofacial Surgery, indicated for multiple quadrant extractions were included in the study. An ethical committee clearance was taken prior to the start of the study from institutional ethical committee, (ethical clearance number PMVIDS and RC/IEC/OMFS/PR/0213-18 Protocol reference number: 0020). All participants of the study had given their written consent for participation in this study.

Demographics of the study are as follows:

Number of males	6
Number of females	19
Minimum age of the subject	18
Maximum age of the subject	70

Patients were given a questionnaire which was a modified dental anxiety scale (MDAS), modified to meet the requirements of the present study and rated accordingly.

The questionnaire comprised of a set of 13 questions which were as follows:


QUESTIONNAIRE

Name: Age/Sex: OPNo:

BEFORE EXTRACTION Date:

1. If you had to go to a dentist for treatment tomorrow how would you feel?
a) Not anxious b) Slightly anxious c) Fairly anxious d) Very anxious
e) Extremely anxious

2. If you were about to have an injection in your gum how would you feel?
a) Not anxious b) Slightly anxious c) Fairly anxious d) Very anxious
e) Extremely anxious

3. If you were to have a tooth extracted how would you feel?
a) Not anxious b) Slightly anxious c) Fairly anxious d) Very anxious
e) Extremely anxious

4. Grade your anxiety levels

1 2 3 4 5

AFTER EXTRACTION:
VERBAL RELAXATION Date:

5. How did you feel when you were about to have an injection in your mouth?
a) Not anxious b) Slightly anxious c) Fairly anxious d) Very anxious
e) Extremely anxious

6. How did you feel when you were about to have your tooth extraction?
a) Not anxious b) Slightly anxious c) Fairly anxious d) Very anxious
e) Extremely anxious

7. Grade your anxiety levels after your procedure

1 2 3 4 5

QUESTIONNAIRE

MUSIC THERAPY Date:

8. How did you feel when you were about to have an injection in your mouth?
a) Not anxious b) Slightly anxious c) Fairly anxious d) Very anxious
e) Extremely anxious

9. How did you feel when you were about to have your tooth extraction?
a) Not anxious b) Slightly anxious c) Fairly anxious d) Very anxious
e) Extremely anxious

10. Grade your anxiety levels after your procedure

1 2 3 4 5

AFTER COMPLETITION OF VERBAL RELAXATION AND MUSIC THERAPY

11. Which method did you find effective to lower your anxiety levels during extraction?
a) Music therapy b) Verbal Relaxation (Counselling) from your dentist

12. Would you prefer your dentist to use music therapy and verbal relaxation (counselling) to lower your anxiety levels next time you undergo extraction?
a) Yes b) No

13. Next time you visit a dentist will you be less anxious and more confident?
a) Yes b) No c) Not sure.

Patients who scored above 10 and required simple extraction were selected for the study. Exclusion criteria included patients suffering from ASA class 3 or above, patients on premedication for anxiety reduction and patients not willing to participate in the study.

The selected subjects were evaluated using Omron Hem-8712 automatic blood pressure monitor for measuring blood pressure and heart rate and fingertip pulse oximeter for oxygen saturation. JBL speaker was used for music therapy and the procedure was carried out in an isolated room. After this initial evaluation music therapy and iatrosedation were used to control the anxiety during extraction.

Selected subjects underwent extraction in two appointments, extraction of a tooth in one quadrant during the first appointment and another quadrant tooth in the second appointment. Subjects were numbered in chronological order of their date of visit for the extraction and all the odd number subjects underwent music therapy in first appointment and iatrosedation in the second appointment whereas all even numbers underwent iatrosedation in the first appointment and music therapy in the second appointment. The type of music used was in accordance with the subject's choice. Pre-operative blood pressure, heart rate and oxygen saturation were recorded and music therapy was started 2 minutes prior to the start of the procedure followed by administration of local anaesthesia, the start of the extraction up to the completion of the extraction procedure. Patients postoperative blood pressure, heart rate and oxygen saturation were again noted along with a set of 3 questions.

Iatrosedation was given by a single dentist to all the subjects in the same operating room. During iatrosedation patients were asked a few questions such as:

1. What are the triggering factors for anxiety?
2. Did the patient take any premedication? If yes what were they?
3. Are environmental factors responsible for causing anxiety if any?

After assessing and acknowledging the triggering factor of the patient's anxiety, subsequent measures were taken by the dentist to control it. For e.g.: if the patient admits that the reason for his fear is a prick of the needle, the needle will be hidden from patients sight and he shall be explained that topical anaesthesia would be used to minimize the sensation of prick thus relieving his fear and helping him gain confidence. Continuous communication was maintained with the patient by the dentist during the entire procedure.

After the completion of the extraction by employing iatrosedative method of anxiety management subjects blood pressure, heart rate and oxygen saturation will be noted and he will be asked a set of 3 questions regarding the iatrosedation followed by asking the subjects 3 questions regarding their anxiety during extraction procedure and the method effective among music therapy and iatrosedation to control anxiety and their preferred method during next visit after the extraction in both the quadrants.

RESULTS:

IBM SPSS VERSION 20.0 was used to analyze the results.

Evaluation of dental anxiety following music therapy:

Effect of music therapy	Mean value preoperative	Mean value postoperative	Mean difference
Systolic bp	121.20	121.52	-0.320
Diastolic bp	77.44	74.12	3.320
Heart rate	90.92	91.12	-0.200
Oxygen saturation	97.16	97.80	-0.640

Evaluation of dental anxiety following iatrosedation:

Effect of Iatrosedation	Mean value preoperative	Mean value postoperative	Mean difference
Systolic bp	122.48	123.84	-1.360
Diastolic bp	79.84	77.40	2.440
Heart rate	87.68	88.60	-0.920
Oxygen saturation	98.16	98.04	0.120

There was a mean increase in the systolic blood pressure and a decrease in diastolic blood pressure postextraction after music therapy and iatrosedation. There was a mean increase in heart rate when either music therapy or iatrosedation were employed.

There was a mean increase in oxygen saturation after subjecting to music therapy whereas a mean decrease after subjecting to iatrosedation indicating that music therapy played a better role compared to iatrosedation.

Subjective evaluation:

	Mean value	Mean difference
Before extraction	13.40	-
After iatrosedation	7.48	5.920
After music therapy	5.32	8.080

On subjective evaluation using a questionnaire, 23 out of 25 subjects stated that music therapy was effective compared to iatrosedation.

DISCUSSION:

Dental anxiety has been found to contribute to patient and practitioner stress and also a significant factor in poor oral health. Increase in the sympathetic and parasympathetic nervous activity is one of the many mechanisms that underlie dental anxiety.[16] Noradrenaline secretion will be increased due to the increase in sympathetic nervous system activity causing a rise in heart rate, blood pressure and muscle contractility.[17,18,19] Amygdala in the limbic system of our brain controls our emotion and music is able to stimulate these areas to reduce negative responses and instead develop an appropriate expression of their own emotions. Passive music therapy is performed in the present study where the patient is made to listen to prerecorded music during the extraction procedure.

On the other hand, iatrosedation is defined as an act of calming the patient by doctor's behaviour which includes verbal and non-verbal communication.[15] In order to control the anxiety of the subjects, 2 questions need to be assessed by the dentist, which are as follows:

1. What is the triggering factor for the patient's anxiety?
2. How can a dentist help the patient in avoiding this factor from triggering anxiety?[15]

Assessment of these questions can help the dentist in reducing patient's dental anxiety. Hence

both music therapy and iatrosedation were conducted on the same patient in 2 different quadrants to compare their efficacy in reducing dental anxiety, unlike other studies where it was conducted on different individuals.

4 parameters were considered in the present study to assess the

patient's anxiety levels which include blood pressure, heart rate, oxygen saturation and subjective evaluation through a questionnaire. As the anxiety levels of a patient can be assessed by the objective changes in blood pressure, heart rate and oxygen saturation these parameters were recorded preoperatively and postoperatively. Patients were subjected to music therapy and iatrosedation during the extraction procedure in order to assess if these non-pharmacological methods can reduce patients anxiety. There was a mean increase in the systolic blood pressure and heart rate postoperatively after both music therapy and iatrosedation and a mean decrease in the diastolic blood pressure postoperatively after both music therapy and iatrosedation. There was a mean increase in the oxygen saturation postoperatively in case of music therapy compared to iatrosedation. Administration of local anaesthesia containing sympathomimetics and stress-induced release of endogenous catecholamines can alter the blood pressure.[20] Liau etal conducted a study on "Cardiovascular influence of dental anxiety during local anaesthesia for tooth extraction" which showed an increase in the systolic blood pressure and heart rate during the extraction procedure.[21] There were previous studies such as Mohammad Ketabi etal[22] which mention about the increase in blood pressure and heart rate of the individuals who underwent extraction using lignocaine with adrenaline compared to individuals who underwent extraction using lignocaine without adrenaline which showed a decrease in blood pressure and heart rate readings postoperatively thus confirming the role of adrenaline as a factor responsible for increase in the heart rate and systolic blood pressure in the current study. Local anaesthesia containing adrenaline was used instead of local anaesthesia without adrenaline in the present study as the adrenaline helps to reduce the toxicity by delaying systemic absorption, reduces the total anaesthetic dose required and prolongs the duration of action.[23]

Thus, though there was an increase in the readings of systolic blood pressure, heart rate postoperatively in the subjects even after using music therapy and iatrosedation, it can be concluded that adrenaline was the reason for its increase and when comparing the relative increase of values of heart rate, blood pressure and oxygen saturation, music therapy played a better role compared to iatrosedation in reducing blood pressure, heart rate, improving the oxygen saturation levels. On subjective evaluation using the questionnaire patient expressed that music therapy was more satisfactory in calming his anxiety levels compared to iatrosedation. Hence it can be concluded that music therapy plays a better role compared to iatrosedation in reducing patient's dental anxiety during the extraction procedure.

Limitation:

As the sample size of the study is small further investigations need to be carried out with a bigger sample size.

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