

# Music as a Nonpharmacological Methodology for Dental Anxiety Management in Routine Dental Procedures during COVID-19 Pandemic

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## Abstract

**Background:** Dental anxiety is one of the key reasons behind patient's unwillingness to seek dental treatment. It is quite challenging to manage and hinders the ability of dentist to deliver the best dental treatment. Many nonpharmacological therapies have been introduced to manage dental anxiety, and music therapy is one of such therapy. **Aim and Objective:** The aim of the study was to assess whether music has an effect in reducing anxiety levels in patients during routine dental procedures. This was a randomized control experimental study. **Materials and Methods:** In this study, 100 patients (mean age: 32 years) from the Outpatient Department of SDKSDC, Nagpur, India, who volunteered and consented to participate in the study were included in the study. Inclusion criteria were patients who require only routine dental treatment. Participants were randomly assigned into two groups: the control group ( $n = 50$ ) and the study group ( $n = 50$ ). Patients in the study group were exposed to relaxing, low tempo music through headphones during routine dental procedures which include scaling and restorative procedure. Both groups were assessed using Corah's dental anxiety scale, blood pressure, and heart rate, before and after treatment. **Results:** Music therapy was effective in reducing anxiety during the procedures; participants in the study group had significantly lower anxiety scores compared to the control group. **Conclusion:** Music therapy has been shown to be an effective nonpharmacological approach to reduce dental anxiety among patients during routine dental procedures.

**Keywords:** Coronavirus, dental anxiety, music therapy, COVID-19

## INTRODUCTION

Dental anxiety is one of the key reasons behind poor oral health affecting 10%–20% of adults and up to 43% of children<sup>[1]</sup> and adolescents due to which patients avoid showing up in the dental clinics and getting their necessary treatments done, which may lead to significant deterioration of dental health. It hinders the ability of dentist to provide good quality of dental treatment. Etiology of dental anxiety is mainly attributed to traumatic or painful dental experiences as well as fearful attitudes learned from dentally anxious family member,<sup>[2,3]</sup> To manage and distress patients with high anxiety levels, the most commonly employed method which has been used since a long time is either conscious sedation or by administration of certain sedative drugs.<sup>[4,5]</sup>

However, nowadays, as patients are well acquainted with the possible side effects of pharmacological therapies, they

prefer nonpharmacological interventions. Therefore, recently various nonpharmacological methodologies have been tried and implemented, for instance, aroma therapy, deep breathing exercises, and music therapy. Research suggests that alternative therapies may have more impact on managing anxious patients as compared to implementation of drug therapy.<sup>[6,7]</sup> Therapeutic uses of music have been known for a long time, and studies have stated it as mood-uplifting and calming. Due to its ability to potentiate direct impact on the central nervous system, and in turn the generation of electrical stimulus by the nerves, it can exert direct effects on the endocrine as well as the cardiovascular system which explains its relaxing and calming effects.<sup>[8]</sup>

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The purpose of this study is to demonstrate the effect of music on alleviating the patient's anxiety levels during dental procedures ranging from operative procedures, periodontal, simple surgical, and endodontic treatments carried out in in SDKSDC with varying levels of dental anxiety. Intensity of anxiety is different for any given individual and can be graded as mild, moderate, and severe. However, irrespective of the intensity, it subsequently affects the person's mindset to seek any dental treatment and ultimately increases the risk of various dental diseases. In a survey of the general population in Maharashtra, approximately 15.5% of the respondents surveyed had some degree of dental fear which never allowed them to seek dental treatment and this significantly resulted in deterioration of their oral health status.<sup>[9,10]</sup>

Given the sight of the needle, burr, and the noise generated by the endo motors, treatment protocols of dentistry tend to generate more fear among people as contrasted with a visit to any general physician. Extractions, flap surgery as well as root canal treatment are the most common therapies associated with high anxiety levels. Alternative therapies to improve the quality of treatment given to the patient should ideally be nonpharmacological, way to administer, and should not require much of instrumentation, music therapy is one of the such treatment which satisfies all of the above criteria.<sup>[11]</sup> The history of music dates back to thousands of years when in ancient Rome and Greek civilizations, Musicians were employed to play soothing music to promote relaxation and healing.<sup>[12]</sup> Currently, as the world is battling coronavirus pandemic, the levels of anxiety have raised significantly; therefore, there is an urgent need for exploring alternative therapies to manage the patients.

In this clinical trial, I aim to shed light on the following questions in my research.

First, does dental anxiety limits the ability of a dentist to deliver high-quality treatment to patients? Second, can nonpharmacological therapies bring about any clinically significant impact on anxiety, especially during the coronavirus pandemic? Third, can music therapy be utilized as a professional and efficient way to relax patients during treatment, especially during ongoing coronavirus pandemic.

### **Aim**

The aim of the study was to assess whether music has an effect on reducing anxiety levels in patients during routine dental procedures. This was a randomized control experimental study.

### **Objective**

The objective of the study was to evaluate and to assess the effect of music therapy in reducing anxiety level in patients during routine dental procedures and to assess whether the music influences dental patients' tension, behavior, and treatability.

## **MATERIALS AND METHODS**

Before starting the study, approval from the institutional ethical committee has been taken. A total of 100 patients, both

male and female, between the ages of 25 and 55 years were randomly selected. These patients reported to the department of oral diagnosis medicine and radiology for regular dental visit and follow-up.

### **Inclusion criteria**

Healthy individuals between the age of 25 and 55 years and patients requiring routine dental treatments not extensive rehabilitation or invasive surgical treatment were included in the study.

### **Exclusion criteria**

Patients <25 years of age, patients without any systemic problems or nervous disorder, and medically compromised patients were excluded from the study.

### **Materials**

Automatic blood pressure (BP) apparatus (Omron SEM 1) [Figure 1] was used to record systolic BP (SBP) and diastolic BP (DBP) and pulse oximeter (The CMS 50D Plus) [Figure 2] to record pulse rate and heart rate iPad Music System (Sony Co.) with earphone [Figure 3].

### **Methods**

Patients requiring routine dental treatment were explained about the complete clinical procedure for the particular treatment; these included scaling, tooth restoration, and extraction. Their dental anxiety scale (DAS) was calculated by Norman Corah's DAS, and their BPs (SBP, DBP, and HR) (hemodynamic variables) were recorded before starting the dental treatment.

A total of 100 patients were assessed randomly and assigned into two groups, the control group (without music) and the study group (with music, where the patient listened to the passive music, relaxing tunes with low beat and tempo using earphones throughout the treatment). In both the groups, patient's BP and heart rate were recorded before and after the procedure. A written patient information and consent form was signed. Preoperative modified questionnaire from Corah's Dental Anxiety Scale (CDAS) was given to each patient preoperatively, in which the patient marks how they feel before the procedure. A dentist rating questionnaire was filled by dentist where the dentist rates the patients' adjustment to treatment from 1 to 6 (1 being high and 6 being low). Postoperative CDAS questionnaire was given to each patient asking the patient to rate how tense they felt during the treatment. Results will be compared to the control and study group to show which of them experienced a lesser anxiety state. Data analysis was done after the data collection, and the final data were tabulated.

## **RESULTS**

### **Age-wise distribution of patients**

In Group I (without music), six patients were ≤30-year age group, 45 patients were between 30 and 50 years, and three patients were between >50 years. Whereas in Group



Figure 1: Blood pressure monitor



Figure 2: Pulse oximeter



Figure 3: Sony earpods for delivering music therapy

II (with music), two patients were  $\leq 30$ -year age group, forty patients were between 30 and 50 years, and eight patients were  $> 50$  years [Graph 1].

### Considering sex-wise distribution of patients

There were a total 26 male and 22 female patients in Group I (without music), whereas 25 male and 27 female patients in Group II (with music) [Graph 2].

### On the basis of dental anxiety scale

In Group I (without music), of fifty patients, 16 had low anxiety, 9 patients had medium anxiety, and 25 patients were highly anxious before treatment.

Whereas in Group II (with music), of fifty patients, 7 patients had low anxiety, 21 patients had medium anxiety, and 18 patients had highly anxious before treatment [Graph 3].

### Observations of hemodynamic changes

In Group I (without music), patient's values of SBP and DBP as well as HR were more, whereas these values were reduced in each individual in Group II (with music) compared to baseline. In Group I, of 50 patients, 12 patients' SBP and 13 patients' DBP were reduced, and there was reduction in HR of 24 patients. In Group II (with music), 13 patients' SBP and 12 patients' DBP were reduced. At the same time, there was a reduction in HR of 25 patients [Graph 4].

### According to the dentist's rating and patient's behavior and treatability

In Group I (without music), of fifty patients, only 12 patients showed high adjustment during scaling and restorative tooth procedures. 22 patients showed medium adjustment, and 17 patients showed low adjustment, where some of the patients were noncooperable during the abovementioned procedures [Graph 5].

In Group II (with music), these findings were very satisfactory. Twenty-six patients showed a high level of cooperation during scaling and restorative tooth procedures, and they were totally relaxed, 23 with medium level, and only two patients showed a low level of adjustment during treatment.

### Considering patient's rating of degree of tension

In Group I (without music), of fifty patients, 7 patients exhibited low level of tension, 24 with medium level of tension, and 17 patients with high level of tension, whereas these findings in Group II (with music) showed significantly good results. The number of patients with low and medium level of tension during treatment was 20 and 21, respectively, and only 11 patients had a high level of tension till completion of the procedure [Graph 6].

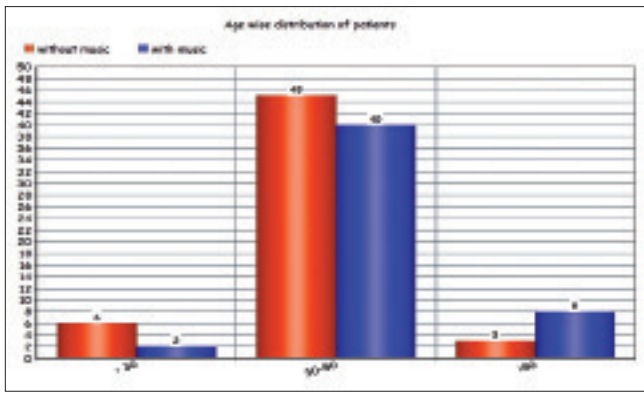
Statistically, Chi-test was applied. The data showed significant differences in both the groups. In Group I (without music), SBP, DBP, and HR were increased significantly. Whereas in Group II (with music), these values were reduced significantly ( $P < 0.0001$ ) compared to baseline findings.

According to the dentist's rating as well as patient's behavior and treatability and considering the patient's rating of degree of tension, statistically significant differences were seen in both the groups where  $P < 0.0001$  and degree of freedom 2.

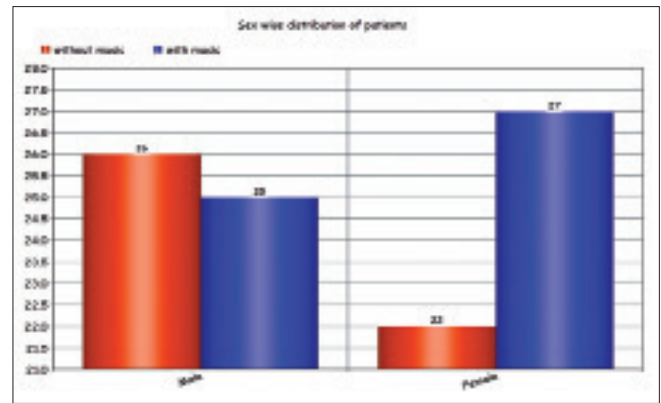
### DISCUSSION

Music has the ability to penetrate the nervous system, and it exerts its impacts by either stimulating or inhibiting various

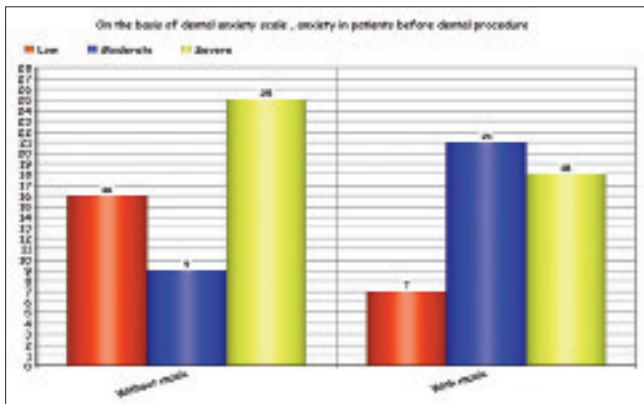
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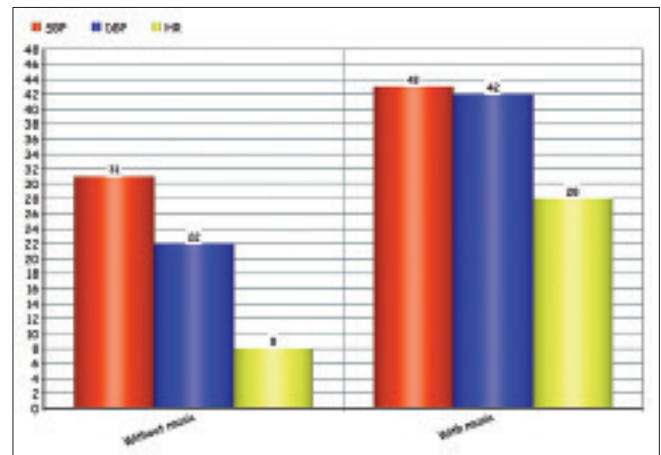
Graph 1: Age-wise patient distribution



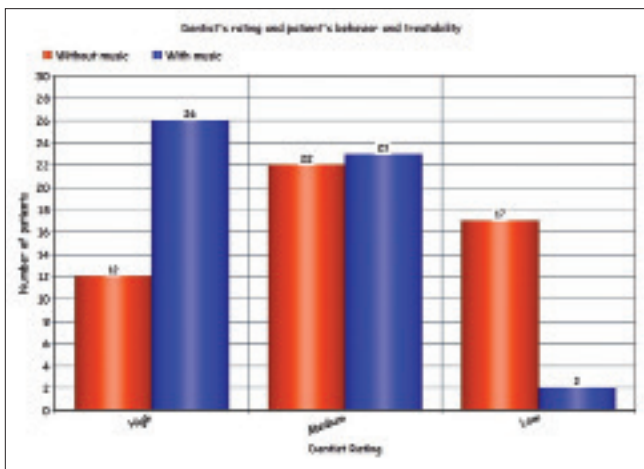
Graph 2: Sex-wise patient distribution



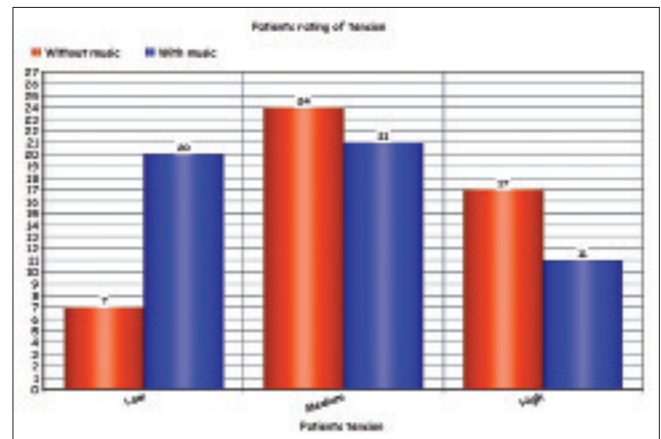
Graph 3: On the basis of dental anxiety scale



Graph 4: Hemodynamic changes



Graph 5: Dentist's rating and patient's behavior and treatability



Graph 6: Patient's rating of degree of tension

impulses to induce its mood uplifting soothing and relaxing effects. It neutralizes the effects of stress hormones such as cortisol and adrenaline secreted in anxious patients. It lowers BP, stabilizes the heart rate, and this is particularly helpful in patients with preexisting cardiovascular patients and patients with certain psychological disorders.<sup>[12-14]</sup>

By altering the brain wave patterns, music has the ability to bring about relaxation in patients. The results of my study

proved that any type of music chosen by the patient was effective in minimizing anxiety and ameliorated patient cooperation during routine dental procedures. As dental anxiety is one the most challenging task to manage particularly in recent times due to the coronavirus pandemic, music therapy can serve as a indispensable tool in the management of highly anxious patients and improve the dentist–patient relationship.

## CONCLUSIONS

- Participants who listened to music during dental treatment experienced less anxiety in contrary to those who did not with a high statistical significance
- Patients who had medium and high levels of anxiety preoperatively had a significant reduction in their postoperative stress and fear levels
- Patients undergoing general treatment were more relaxed and comfortable during their dental visit compared to those undergoing specific dental treatments
- Females were found to be more anxious than males preoperatively
- Patients belonging to the age group of 25–50 years were found to be more stressful than participants aged 50 years
- Influence of music as a relaxation method was highly significant with no delectation to age, sex, or marital status
- Music has been proven to be a very useful tool in making dental treatment in clinics more pleasant and relaxing
- Further research is still required to accurately assess the anxiolytic effect of music as there are many other points to look into this topic.

## SUMMARY

The results clearly state that musical therapy has many advantages and has ability to bring about a state of calmness and relaxation in the patients. Despite the ongoing circumstances when the anxiety has become very significant and can be provoked by pretty much anything, music can offer mood uplifting benefits.

The purpose of this study was to evaluate and to assess the effect of music therapy in patients undergoing routine dental procedures by listening to passive music using headphones and to determine whether music influences dental patient's stress, behavior, and treatability. In the present study, patients selected a suitable music of their choice, which had an additional benefit of better patient compliance and also had relaxation benefits, it significantly promoted positive attitude in the patient and enabled the dentist to provide good quality dental treatment without much of the hindrance.

Patients, who were given music therapy during the dental procedures showed lower level of tension and stress, had positive approach and better adjustment to treatment.

Hence, music therapy is a professional and nonpharmacological methodology to minimize dental anxiety, improve dentist–

patient relationship by making the patient cooperative, ease the delivery of treatment, reduce the utilization of sedative drugs, and thereby prevent any side effects associated with them and is worth a try by dentists across the globe, especially in the current pandemic.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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