

The German International University

Department of English and Scientific Methods

## **The Effect of Music on Dental Anxiety**

A literature Review submitted by:

Student Name (ID Number)

Student Name (ID Number)

Student Name (ID Number)

Student Name (ID Number)

**RPW T.**

Supervised by:

June 2021

## **Outline:**

### **I. Introduction**

1. Problem: Dental Anxiety.
2. Theoretical background: the effect of dental anxiety, factors that cause dental anxiety, and the importance of music.
3. Purpose and research question: What is the impact of Music on Dental anxiety?
4. Definitions of Variables: Dental Anxiety, Music.

### **II. Methodology**

1. Keywords that guided the research: Dental Anxiety, Music.
2. Years covered: 2011-2021.
3. Sources used: Ebsco Host.
4. Inclusion and exclusion.

### **III. Results:**

1. Grouping of Articles:
  - *Two groups*: one group including a sample of *children*, and one group including a sample of *adults*.
2. Studies with children: (Dixit & Jasani, 2020; Tshiswaka & Pinheoro, 2020).
  - a) Purpose & Questions/Hypothesis.
  - b) Sample
  - c) Instruments and procedures
  - d) Results

e) Practical implications.

3. Studies with adults: (Gupta & Ahmed, 2020; Packyanathan et al., 2020).

a) Purpose & Questions/hypothesis.

b) Sample.

c) Instruments and procedures.

d) Results.

e) Practical implications.

#### **IV. Discussion:**

1. An Overview of the findings in relation to the research question:

The four studies showed a positive effect of music on dental anxiety.

2. Differences:

- Difference in sample size.
- Difference in sample age.
- Difference in Sample Location.
- Difference in instruments measuring anxiety.

3. Interpretations of the findings of the studies:

- Limited generalizability.
  - Limited locations.
  - Small sample size.

4. Recommendations for future research:

- Repeating each experiment more than once.
- Experimenting on a different age group (adolescents).

## **I. Introduction:**

A major problem faced by patients undergoing dental treatment is dental anxiety. Fear is a major factor in inducing nervousness in people when they undergo dental treatment (Tshiswaka & Pinheiro, 2020). Before and during dental procedures, fear may arise from pain, bleeding, injections, or the rotary noises included in the treatment (Packyanathan et al., 2019). Dental anxiety has a major effect on patients, leading some of them to avoid dental treatment, resulting in deteriorated oral health. Moreover, doctors find it very challenging to treat patients with dental anxiety. The available pharmacological techniques to reduce dental anxiety are expensive and have plenty of side effects (Dixit & Jasani, 2020; Packyanathan et al., 2019). Music has the potential to improve a patient's well-being and mood. Music increases serotonin levels, which boosts morale and reduces pain during a pain stimulus (Packyanathan et al., 2019). Although there is significant information on the possibility of music impacting the anxiety levels of patients during medical surgery, the data on the relationship between music and dental anxiety, specifically, is limited (Gupta & Ahmed, 2020).

The purpose of this review is to determine the effect of music on dental anxiety. What is the impact of music on dental anxiety?

In this review, music (the independent variable) is defined in one study as instrumental earth sounds (Gupta & Ahmed, 2020). In another study, music is categorized as children's songs in Portuguese (Tshiswaka & Pinheiro, 2020). In a third study, it is defined as the classical music of Veena (Packyanathan et al., 2019). In the last study, music is defined as the Indian classical instrumental music of Raag Sohni, played by Pandit Shiv Kumar Sharma on Santoor (Dixit & Jasani, 2020). Dental anxiety (the dependent variable) is also defined in various ways. In one

research study, dental anxiety is defined by the heart rate measurements that were taken before, after, and during the dental care treatment, and also by a score of state anxiety during the treatment (Tshiswaka & Pinheiro, 2020). In another study, dental anxiety is represented by a score of heart rate variation before, during, and after treatment and by a score of state anxiety from 0-10, such that 0 means no anxiety and 10 means the highest level of anxiety (Gupta & Ahmed, 2020). In the third study, dental anxiety is defined as scores of heart rate variation and changes in blood pressure, together with a score ranging from 5 to 25, showing how anxious the patient is as the score increases (Packyanathan et al., 2019). In the last study, dental anxiety is defined operationally by a score of state anxiety by depicting happy and unhappy faces, the number of observed disruptive behaviors exhibited by the patient, and a score of dental anxiety from 15 – 75 (the highest score) with 38 the benchmark for the presence of anxiety (Dixit & Jasani, 2020).

## II. Methodology

EBSCOHost database was used to find the research studies included in this review. The keywords that were used were *dental anxiety* and *music*. Some delimiters were used, including PDF full text, research studies written in English, and the years were limited from 2011 to 2021 which gave 253 results. More delimiters were added including AB Abstract for *Music* and choosing Academic Journals from source types, which gave the final number of 16 results.

Out of the 16 research studies, five were excluded because they were secondary. Six of the studies were primary; however, they were excluded because they were irrelevant to the research question. One study did not include patients and examined the effect of music practice on dental students' stress levels. Another study evaluated the effect of behavior management techniques and the use of Nitrous oxide to decrease the anxiety levels of adult pediatric patients. The last study evaluated the impact of a novel communication aid, *Message to Dentist* (MTD), on dental anxiety. One study was excluded because it was written in Spanish, and two of the primary irrelevant studies were repeated. In addition, two of the primary relevant studies mentioned below were repeated.

The remaining three studies (Packyanathan et al., 2019; Dixit & Jasani, 2020; Tshiswaka & Pinheoro, 2020) were primary relevant studies, so they were included in this literature review. One study (Gupta & Ahmed, 2020) was a supplementary study obtained from Google Scholar.

### III. Results:

All four articles included in this literature review can be grouped into two groups according to the age of the sample. The first group contains the studies that have children. This group includes two studies (Dixit & Jasani, 2020; Tshiswaka & Pinheoro, 2020). The second group contains studies that have adults. This group includes (Gupta & Ahmed, 2020; Packyanathan et al., 2019).

The first study belonging to the first group and conducted by Dixit & Jasani (2020) *aimed* to compare the impact of Bach Flower Therapy and Music Therapy on the minimization of dental anxiety in children. The researchers' *research question* can be inferred as: what is the impact of Bach flower therapy and music therapy on the decrease of children's dental anxiety? As for the *research sample*, the study included a convenient sample of 120 children aged 4-6 from India; 73 participants were males, and the rest were females. Regarding the *instruments*, to measure anxiety, the North Carolina Behavior Rating Scale (NCBRS) was used. To complete this scale, an independent assessor observed the treatment video and noted the displayed disruptive behavior of the patient out of 4 identified behaviors. In addition, the Facial Image Scale was used; it included five faces (ranging from very unhappy to very happy) from which the child chose the one that best described their current feeling. The pulse Oximeter was also used to measure the pulse rate and oxygen saturation of all children. Finally, the Manual sphygmomanometer and stethoscope were used to measure systolic and diastolic blood pressure. Regarding the *procedure*, it was a pre-post design. The chosen children were divided equally into three groups: music therapy group (MT), Flower therapy group (BFT), and control group. Before treatment, the Facial Image Scale was completed, and the physiological measurements were evaluated by a trained

assistant. Fifteen minutes before the treatment, the BFT group took four drops of “rescue remedy” diluted in 40 ml of water; however, the MT group and the control group took 40 ml of plain water. During the treatment, the BFT and control group were told to wear headphones without playing music; on the contrary, the MT group was given headphones, which had Indian classical instrumental music playing (Raag Sohni played by Pandit Shiv Kumar Sharma on Santoor). During the treatment, the pulse rate, oxygen saturation, and systolic and diastolic blood pressure were measured. After the treatment, the NCBRS and the Facial Image Scale were completed. The *results* of this study showed that the behavior of children in the BFT group was better than those in the control group ( $P=0.014$ ). In the intraoperative time period, the pulse rate of the participants in both BFT and MT groups decreased ( $p<0.001$ ) compared to the control group which significantly increased ( $P < 0.001$ ). In addition, diastolic blood pressure in the decreased in MT and BFT groups and increased in the control group. At the postoperative time period, the frequency of the children in different FIS categories showed no statistically significant difference across the three groups ( $P=0.243$ ). However, blood pressure in children in the MT group was lower than that of children in both the BFT and control group and the postoperative time period. There were no *practical implications* included in this study.

The second study belonging to the first group and conducted by Tshiswasaka & Pinheiro (2020) *aimed* at determining the impact of music on children’s anxiety during dental treatment. The researchers’ *hypothesis* was music does not impact children’s anxiety level during dental treatment. The *sample* consisted of 40 children between the ages of 5-11 from the Children’s clinic of the school of Dentistry of PUC-Campinas, Brazil. As for the participants’ gender, 23 were males and the rest were females. The selection criterion was convenient. Regarding the *instruments*, oxygen saturation and heart rate were measured with a finger oximeter (G-TECH,



Model Oled graph, Beijing, China). A pain scale was also included; the children were asked to note the image that best described their feeling during and after the treatment. To measure state anxiety, the Corah Dental Anxiety Scale was used which required children to rate their feelings at the moment of contacting the assistants and the dentist by answering 4 questions with 5 possible answers. Regarding the *procedure*, the children were divided randomly into 2 groups: One music group and the other non-music group. Before the welcome and after the treatment, the children completed the pain scale and the Corah Dental Anxiety Scale, then the welcome started by explaining the procedure of the research and the treatment to the children. Before the reception, during and after treatment, the oxygen saturation and heart rate were measured. For the music group, the children went to the treatment rooms, and handsets with mp3 songs and headphones were distributed to the children after being seated before the beginning of the treatment. The same repertoire heard by the children was connected to the sound in the room. For the control group, after welcoming them, they were led to the treatment rooms and had the treatment without listening to music. The type of procedure was pre-post design. The *results* showed that the heart rate (pulse) of the children who listened to music during dental treatment decreased ( $p=0.05$ ). The heart rate (pulse) of the children who did not listen to music during dental treatment did not change during the treatment ( $p=0.53$ ). Therefore, the hypothesis was rejected. However, there was not a noticeable change in oxygen saturation, Corah anxiety scale and pain for the children who listened to music during dental treatment. As for *practical implications*, the researchers did not mention them.

*After having a look at the studies with children, the studies including adults will be tackled.*

The first study belonging to the second group and conducted by Gupta & Ahmed (2020) *aimed* at examining how music impacts anxiety and pain levels of dental patients during minor oral surgery (MOS) procedures. The *research question* can be inferred as: What is the impact of music on patient anxiety levels during MOS procedures? The researchers included a convenient *sampling* of 50 adult participants aged 20-80 years old, who were attending the MOS clinic at Birmingham Dental Hospital from 25 June 2016 till 25 July 2016. 68% of the patients were females, 32% were males. As for the *instruments*, a 0–10-point scale was used to measure patients' anxiety levels, and a pulse oximeter measured the heart rate variation. In addition, a short questionnaire evaluated the patients' overall experience: whether music had an impact on their anxiety and pain levels and how and whether they would like music if they were to have the same treatment again. The researchers used a pre-post *procedure*. Anxiety levels were measured before and after the treatment, and the heart rate changes were noted before, during, and after the treatment. Patients were handed earphones connected to an iPad including instrumental music with earth sounds. The surgical procedure was then conducted while the patients listened to music. After the treatment, the patients filled the short questionnaire. For *results*, 92% of the patients stated that music decreased their anxiety, and 90% of the patients wanted to listen to music during their next visit. Patients also reported that music made communication easier and reduced pain and discomfort. In addition, heart rate was reduced greatly during the procedure. As for *practical implications*, they were not mentioned.

In the last study belonging to the second group that was conducted by Packyanathan et al. (2019), it *aimed* to examine how music therapy affects dental anxiety in patients during their extraction procedure. The *research question* of this study can be inferred as: What effect does music therapy have on patients undergoing a dental extraction procedure? The *sample* included

50 patients aged between 17 and 64. Participants needed to be healthy and fit for the extraction, and participants who had any systemic disease or were pregnant or deaf were excluded from the study. The location was the department of oral and Maxillofacial surgery at Saveetha Dental collage, Chennai, India. As for the selection criterion, it was not stated. Regarding the *instruments*, anxiety levels were measured using the Modified Dental Anxiety Scale, which is a brief scale of 5 items. Heart rate changes and blood pressure were also measured using a pulse oximeter. Concerning the *procedure*, after the consent was taken from the patients, they were divided into 2 groups (test group and control group). All participants were then asked to wear headphones. For the test group, classical music was played in their headphones for 5 minutes before and during the extraction procedure. The control group did not hear any music, and their headphones were only on noise cancellation mode. The anxiety levels were measured before and after the treatment following a pre-post procedure design. Regarding *results*, the music group witnessed a significant decrease in systolic pressure, diastolic pressure, and heart rate, whereas for the control group, these parameters increased ( $P$  value  $< 0.05$ ). The Modified Dental Anxiety Scale showed a significant reduction in anxiety levels for the music group in comparison to the control group whose anxiety levels increased ( $P$  value  $< 0.05$ ). For *practical implications*, the researchers recommended the use of music in the waiting area through headphones to reduce anxiety prior to any dental treatment.

**IV. Discussion:**

- *Overview of results related to the examined research question.*
- *Differences across the 4 studies.*
- *Interpretation of results.*
- *Recommendations for future research.*

## References

- Dixit , U. B. ,& Jasani, R. R. (2020). Comparison of the effectiveness of Bach flower therapy and music therapy on dental anxiety in pediatric patients: A randomized controlled study. *Journal of Indian Society of Pedodontics and Preventive Dentistry*, 38(1), 71–78. [https://doi.org/10.4103/JISPPD.JISPPD\\_229\\_19](https://doi.org/10.4103/JISPPD.JISPPD_229_19)
- Gupta, A., & Ahmed, B. (2020). Experience of listening to music on patient anxiety during minor oral surgery procedures: a pilot study. *British Dental Journal*, 228(2), 89–92. <https://doi.org/10.1038/s41415-019-1162-1>
- Packyanathan, J. S., Lakshmanan, R., & Jayashri, P. ( 2019). Effect of music therapy on anxiety levels on patients undergoing dental extractions. *Journal of Family Medicine and Primary Care*, 8(12), 3854–3860. [https://doi.org/10.4103/jfmmpc.jfmmpc\\_789\\_19](https://doi.org/10.4103/jfmmpc.jfmmpc_789_19)
- Tshiswaka , S. K., & Pinheiro , S. L. (2020). Effect of music on reducing anxiety in children during dental treatment. *Rev Gaúch Odontol*, 68, 1–8. <https://doi.org/10.1590/1981-863720200003320190049>