

The Efficacy of Aroma and Music Therapy to Reduce Dental Anxiety and Pain Intensity

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ABSTRACT

This study aimed to determine the effectiveness of aromatherapy and music therapy in managing dental anxiety and pain among restorative dental patients in Peshawar, Pakistan. Sixty dental patients were selected after strictly following the inclusion and exclusion criteria. Informed consent was taken from the patients and instructed on the study protocols. Two groups were formed. One group had aromatherapy during the dental procedure, and the other had music therapy. The dental anxiety scale revised, present pain intensity and pain severity were used as the measuring tools in the study. SPSS 23 was used for statistical analysis. Chi-square and Mann-Whitney U tests were used for the analysis of the results. The association between pain intensity of dental patients with aromatherapy and music therapy was not significant. The percentage of discomforting pain in patients after aromatherapy was higher than in music therapy, while a higher percentage of patients were completely pain-free after music therapy. The mean rank score of pain severity was higher in a patient who received aromatherapy than music therapy. The difference in the pain severity scores across the therapy groups was statistically significant. The mean rank score of dental anxiety was also statistically significantly different across the therapy groups. The mean rank score of dental anxiety was higher for the patients who received aromatherapy than music therapy. It was concluded that distraction therapy works better to reduce the dental anxiety and pain intensity of dental patients. Furthermore, studies should be conducted to closely evaluate the difference and association of non-pharmacological treatments in this area.

INTRODUCTION

Dental anxiety is common and can affect people of any age. Much research has focused on dental anxiety in various populations. Dental tools and setups can cause dental nervousness.¹ The procedures that involve a needle or a drill appear to be the most frightening. Invasive functions such as scaling, deep probing, fillings, extractions, and root canal therapy are attributed to greater discomfort, notably in people who have a lot of anxiety about going to the dentist.¹ Anxiety is traditionally associated with painful stimuli and enhanced pain perception, causing these patients to experience more pain than usually lasts and intensifying their pain memory.²

Generally, dental anxiety can be treated by pharmacological, psychological interventions, or both, which are effective in decreasing dental anxiety.³ However, psychological interventions are more preferred, efficient, and suitable for the patients.

The addition of pleasant ambient odors to the dental setting can also reduce anxiety.⁴ The odor can elicit a range of emotions and make a patient averse to dental care. Aromatherapy is an integrative medicinal technique that uses natural plant extracts to generate physiological or pharmacological effects through the olfactory receptors.⁵ Inhaling soothing odors, including herbal extracts, reduce anxiety and enhances mood. The aroma molecules in essential oils move directly from the olfactory nerves to the brain when inhaled, affecting the amygdala, the brain's emotional centre.⁶ Its effectiveness has been proven in treating mild anxiety than severe anxiety. In comparison to the control condition, statistical analysis demonstrated that both acoustic aromas of orange and lavender decreased anxiety and enhanced mood in patients awaiting dental treatment. This research shows scents can affect emotional states and suggest that using odors can help dental patients feel less frightened.⁵

Distraction is an effective method for redirecting a patient's mind away from a potentially painful process.⁷ This allows for a reduction in discomfort perception and the avoidance of negative behavior. Efficient music has changed human brainwave activity, resulting in deep relaxation and pain relief.⁸ Music therapy is a non-invasive treatment in which a patient listens to soothing music while undergoing distressing processes. The result is a combination of relaxation and distraction that, in turn, reduces the activity of the neuroendocrine and sympathetic nervous

systems.⁹ It has been successful in both pediatric and adult dental patients. In India, a study showed that post anxiety symptoms are reduced through both treatments, i.e., aromatherapy and music therapy, but their difference was not statistically significant. Although the music therapy showed a positive outcome.¹⁰ The purpose of this study was to determine the effectiveness of both therapies in our population as no such studies were conducted in Peshawar, Pakistan. Additionally, most of the patients visited the dental clinic with dental anxiety.

METHODOLOGY

An experimental study was conducted at the dental teaching hospital of Peshawar. The time duration of the study was August - October 2021. Sixty dental patients were selected between the age of 20-26 years who were visiting the dental hospital for restorative treatments. The patients having severe problems or pains were excluded from the study. The willing patients who had mild to moderate anxiety and pain intensity and had not undergone any dental procedure were selected.

Additionally, the patients who were not allergic or biased to any aroma and music were included. The study protocols were briefed to the patients, and informed consent was taken. Sixty patients were divided into two groups comprised of 30 patients in each. One group were provided dental treatment under music therapy. In contrast, the other group of patients went through dental treatment and aromatherapy, i.e., the strawberry aroma in the treatment room. The natural strawberry aroma was introduced in the treatment room before the patient's arrival, and it was maintained throughout the procedure. During the patient's dental treatment, calming, melodic music was played in another setup. The dental anxiety scale was revised, present pain intensity scale and pain severity scale were used before and after the intervention. SPSS 23 was used for statistical analysis. Numeric data were presented as mean and its respective standard deviation. Nominal data were presented as frequency and percentages. P values less than equal to 0.05 was considered significant. A Chi-square test was used to find the association between pain intensity of dental patients and aromatherapy and music therapy. Mann-Whitney U test was used to find the statistical difference in the score of pain intensity and dental anxiety across the groups that received aromatherapy and music therapy.

RESULTS

An experimental study was conducted on 60 dental patients with a mean age of 22.72 ± 2.092 years; 38.3% were males, and 61.7% were females. Aromatherapy was given to 50%, and music therapy was given to 50% of dental patients.

Table 1 shows that the association between pain intensity of dental patients with aromatherapy and music therapy was not significant. The percentage of discomforting pain in patients after aromatherapy was higher than in music therapy, while a higher percentage of patients were completely pain-free after music therapy, as shown in table 1.

Table 2 shows that the mean rank score of pain severity was higher in a patient who received aromatherapy than music therapy. The difference in the pain severity scores across the therapy

groups was statistically significant. The mean rank score of dental anxiety was also statistically significantly different across the therapy groups. The mean rank score of dental anxiety was higher for the patients who received aromatherapy than music therapy, as shown in table 2.

Table 1: Association of Aromatherapy and Music Therapy on Pain Intensity of Dental Patients

Treatment groups	Present Pain Intensity			P-value
	No pain	Mild	Discomforting	
Aroma therapy	8 (13.3%)	13 (21.7%)	9 (15.0%)	0.470
Music Therapy	9 (15.0%)	16 (26.7%)	5 (8.3%)	

Table 2: Difference in the Score of Pain Severity and Dental Anxiety Across the Aromatherapy and Music Therapy Groups

Parameters of dental pain and anxiety	Treatment groups	N	Mean Rank	Sum of Ranks	Mann-Whitney	Z	P-value
Pain severity	Aromatherapy	30	38.30	1149.00	216.000	-3.489	≤ 0.001
	Music Therapy	30	22.70	681.00			
Dental anxiety level	Aromatherapy	30	39.90	1197.00	168.000	-4.248	≤ 0.001
	Music Therapy	30	21.10	633.00			

DISCUSSION

Many people will suffer anxiety at some point in their lives. Dental anxiety is stress related to dental treatments, particularly procedure preparation, uncertainty, discomfort, or interaction with dentist specialists in the dentist's practice.¹¹ It can be challenging for doctors to deal with nervous patients since they are challenging to handle and manage, and they may miss or cancel visits.¹²

Pharmacological and non-pharmacological techniques are used to treat anxiety. Conscious sedation or general anesthesia are two frequent pharmacologic treatments for anxiety.¹³ This approach carries some dangers, necessitates specialized apparatus, cannot use on people with drug sensitivities, and has numerous detrimental effects.¹⁴ Complementary and Alternative Medicine (CAM) was the subject of a search for a substitute way.¹⁵ CAMs had traditionally become recognized as effective non-pharmacological treatments for anxiety. Aromatic oils are a CAM used to stimulate the olfactory pathway and alleviate anxiety sensations. Aromatherapy has been reported to have emotional, psychological, and sociological benefits. It is indeed remarkably free from side effects.¹⁶

According to our study, the mean rank score of dental anxiety was also statistically significantly different across the therapy groups. The mean rank score of dental anxiety was higher for the patients who received aromatherapy (39.90). Aromatic oils' mechanism of action for producing psychological shifts is still undetermined. Lavender essential oil, for example, has been shown to work post-synaptically, and this is thought to alter the action of cyclic adenosine monophosphate (cAMP). Sedation is linked to a decrease in cAMP activation.¹³ The usage of distilled plant components stretches origins to mediaeval Persia, but Rene Maurice Gattefosse originated the terminology aromatherapy in the early twentieth decade.¹⁷ Research on individuals visiting dental clinics found that aromatherapy positively impacts anxiety, emotion, attentiveness, and relaxation.¹⁸ Aromatherapy has been among those suggestions because it has the additional therapeutic benefit of becoming non-invasive and low-cost. Natural oils are fragrant, volatile organic molecules extracted through herbs with steam or compression. Therefore, plant extracts' safe and effective application for curative purposes has reduced generalized pain and anxiety.¹⁹ In a meta-analysis done by Gong, he reported that Inhalation combined with massaging aromatherapy considerably reduced anxiety levels in various conditions, according to the combined findings.²⁰ SON HK and colleagues reported the beneficial effect of aromatherapy combined with music therapy to reduce anxiety in the nursing students.²¹

One technique to deal with anxiety is music therapy. According to our study, the mean rank score of dental anxiety was lower for the patients who received music therapy (21.10). Ever

since the ancient Greeks, Music has been employed to help people relax. Help assist individuals in coping with uncomfortable situations, anxiety, despair, and other negative emotions; traditional music is frequently chosen.²² since music is used for relaxing therapy, it is thought to be able to boost attention, memorization, and sensory perception of listening.²² Relaxing music is a genre of music that is said to excite the brain into producing waves while also calming the listener. Relaxation music therapy can support patients overcome anxiety induced by psychological factors by reducing blood pressure, heartbeat, and respiration rate, resulting in a calmer and more peaceful individual.²³ According to past studies, music therapies can help with sleep issues, relaxation, and the elimination of uncomfortable feelings. Since the body responds to the rhythmic pattern, background music with a gentle and calming beat with a pace of 60-80 beats per minute causes a drop-in body rate. Music also reduces autonomic nerve reflexes, which leads to a reduction in vitals.²⁴

CONCLUSION

There was no significant difference between aromatherapy and music therapy in the pain intensity scores. Music therapy works better to reduce the dental anxiety and pain severity of dental patients.

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