Music therapy can be a highly effective complementary method contributing to the traditional clinical procedures in reducing anxiety in dentistry.

The use of music therapy in reducing the level of anxiety in dentistry – the current state of research – (Part I)

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RUNNING TITLE Music therapy and Dentistry
KEYWORDS dental treatment, fear, music therapy
WORD COUNT 2 537
CONFLICT OF INTERESTS no conflicts of interest

ABSTRACT

Background: The article presents the current state of research on the use of music therapy in dentistry. The author has conducted a systematic review of the available publications concerning the therapeutic effects of music on reducing the level of fear in dental patients. Due to the relatively recent interest in applying music therapy to dental environments, the number of publications on the subject is limited. Material and Methods: The systematic review has been conducted on the basis of three electronic databases: PubMed.gov, the-cochranelibrary.com, ebscohost.com and on the basis of Polish Medical Bibliography GBL, and the database of Medical Library CMUJ: www.bm.cm-uj.krakow.pl. Results: The researchers, whose works have been reviewed, have used music therapy methods in conservative dentistry, endodontics, periodontics, prosthodontics, oral surgery in both adults and children. Mainly, receptive therapy was used, with the application of various musical genres, including “white noise”. Therapy results were measured with standard tools and also individual scales assessing the levels of anxiety. Due to a variety of methodologies used, different ways of analyzing the results and divergent approaches to the concept of music therapy, there is no possibility of a direct comparison between them. This situation has also been observed by other authors. Conclusion: There is a need
for a systematic approach towards both methodologies used in music therapy research and evaluation of their effectiveness. In order to facilitate the use of music therapy by a larger number of dental professionals, there is a need for preparing a consistent and clear methodology of its application and verification of its results.

BACKGROUND

This study aims to answer the question concerning the current state of research on the application of music therapy in dentistry. It also aims to provide a systematic analysis of the achievements in this field in order to answer the question whether it is possible to achieve positive and statistically significant clinical results with the use of the above-mentioned therapeutic intervention. Additionally, it tries to identify areas for further research with a view of bringing this issue to the attention of a wider readership in dental environments, among psychologists, psychotherapists and music therapists who would be interested in cooperating on implementing elements of music therapy into everyday clinical practice. A wider context for the present systematic review can be found in another article entitled: Music Therapy – History of Development. Part II (Muzykoterapia – historia rozwoju, cz. II), in which the definition of music therapy and directions of its development in medicine are presented. The article focuses especially on dentistry due to the frequent occurrence of dental fear and anxiety in patients awaiting dental treatment. It points out that in view of restrictions in the use of drugs reducing the level of anxiety, music therapy may offer an interesting alternative.

To meet the aim, we conducted a systematic review of the already published and widely available scientific publications related to music therapy and its effectiveness in reducing the level of anxiety in dental environments.

MATERIALS AND METHODS

The systematic review was conducted with the help of three electronic databases: PubMed.gov, thecochranelibrary.com, ebscohost.com, and also on the basis of Polish Medical Bibliography GBL and the database of the Medical Library CMUJ: www.bm.cm-uj.krakow.pl. The main criterion for qualifying a given study for the present systematic review was the subject related to the application of the elements of music therapy in clinical studies in the field of integrated dentistry. The language of the publications taken into account was English; works with a summary in the English language were also included, as well as those written in Polish. This paper presents and discusses fifteen studies whose content best corresponds to the research question posed, which represent an appropriate level of scientific credibility and methodological accuracy, and which facilitate a consistent verification of the presented results.

RESULTS

The summary of the results of research on different music therapy methodologies is presented in Table I [1-15]. Each of the above-mentioned studies includes a detailed description of the treatment, the groups of patients undergoing the treatment, the methods measuring the level of anxiety used for achieving the therapeutic effect, and the results of the therapy. Indicators of subjective feelings and the levels of fear in patients are presented in studies No. 1, 2, 4-9, 12-15 (Table I) and in Weisbroid’s study [16]. On the other hand, studies No. 3, 6 and 8 in Table I include the observations of medical personnel, which contribute to the description of patients’ behavior during the treatment [3, 6, 8]. Objective measurements of the patient’s physiological parameters were obtained. A change in the parameters of physiological activities may signal the occurrence of stress and/or anxiety, or the reduction of anxiety, which is described in research No. 2, 3, 6, 7, 10-12 and 14-15 [2, 3, 6, 7, 10-12, 14-15]. Music therapy can be applied two-fold. It can affect the recipient through the sense of hearing, which is described in studies No. 1, 2 and 5-15 in Table I, and in the studies by Weisbrook [1, 2, 5-15, 16]. It can also play a part in a therapy engaging other senses, as described in studies No. 3 and 4 [3, 4]. During the treatment the patient may remain entirely passive in accordance with the standardized procedure: studies No. 2, 3, 5, 6, 15 described [2, 3, 5, 6, 15] or the patient may participate in the selection of specific therapeutic elements: studies No. 1, 4, 7-12, 14 comprised in Table 1 [1, 4, 7-12, 14] and in Weisbroid’s study [16]. Positive therapeutic effects are described in studies No. 1-5, 7-11, 13-15 [1-5, 7-11, 13-15] and in Weisbroid’s study [16]. In some studies, no statistically significant differences have been noted concerning the effects of music therapy on the patient: studies No. 6, 12 [6, 12]. On the other hand, Weisbroid [16] presents the work of Gardner and Licklider who studied the effects of music chosen by the patient and “white noise” (the sound of waterfall). During treatment the patient could change the volume of music and turn on “white noise” at the moment when feeling pain. Gardner and Licklider drew the conclusions that music had a relaxing effect, while “white noise” served as a reducer of pain [16]. Their observations showed that music functioned well in masking the sounds of the handpiece turbine and diverted the patient’s attention from the treatment. They used the therapy in 5000 dental treatments and in 90% of them music therapy was perceived as effective [16]. In study No. 10 (Table I) the highest level of anxiety was noted during surgical procedures, lower in prosthetic treatment and the lowest in conservative dentistry treatment [10]. The contemporary research (Table I) also shows positive results of music therapy before the treatment by reducing anxiety in patients with medium and...
high level of anticipatory anxiety in patient’s subjective assessment (assessment of the music program, assessment of the patient comfort level), and in the objective assessment (rating scales, STAI x1 and the PR, and physiological parameters: SBP, DBP, HR). The positive effects were also observed during dental procedures (studies No. 1, 2, 4, 5, 7-11, 13-15) [1, 2, 4, 5, 7-11, 13-15].

DISCUSSION

In view of an increasing number of scientific articles published and rapid progress in medicine, a conscientious and effective approach to the patient demands consistent and up-to-date knowledge. Music therapy which is based on facts and scientific proof – Evidence Based Music Therapy (EBMT) – is an approach which is in accordance with EBM philosophy. In the methodology of music therapy, a therapist tries to integrate current best medical evidence, supported by one’s own experience, into every therapeutic decision he or she takes for the benefit of the patient [17]. In a relatively young and dynamically developing discipline, as is the case with music therapy, a significant obstacle to effective therapy may be posed by the lack of time and conscientious analysis of relevant research concerning specific clinical cases. In order to solve the problem, one can resort to secondary sources with updated material – such as text books prepared in accordance with EBM regulations and the published directives [18]. However, in order for them to be created, there is a need for an increased number of research projects within the EBMT framework, together with interdisciplinary cooperation.

An attempt at creating a systematic review analyzing the current state of research on the effectiveness of music therapy on reducing fear in dental environments could be made in the form of a descriptive review. However, it is not possible to create a meta-analysis fulfilling all the requirements of scientific credibility mostly due to the state of the scientific literature in the field of music therapy – too small a number of randomized trials. On the other hand, additional difficulties in the phase of interpreting the results of scientific research may be posed by several factors, such as the diversification of patient groups in given studies, or very different understanding of music therapy. This may in turn lead to divergent music therapy sessions, not only from the technical and methodological perspective, but also through the use of different types of music for the research purposes. It is worth pointing out that the published works describe subjecting patients to various clinical treatments. This also makes it more difficult to draw scientifically credible conclusions due to small numbers of the given trial groups. The existence of the above problems was noted also by other authors, for instance Shapiro et al. [3]. In their research, which they conducted on a group of children, they encountered the following problems: the lack of blank in the evaluation of negative behaviors – as a result of the method used in the research, the evaluator could determine in what environment the children were being raised. The group of children was small and not very representative, while the clinical procedure was only minimally invasive. Shapiro believes that the procedure may have an influence on the dentist performing the treatment through the very environment created for therapeutic purposes, but it can also indirectly influence the child through the effect exerted on the parents (even though they were not present during the treatment) [3].

In 1999 Biley [19] reviewed the scientific literature on the application of music therapy in medicine. In one of the chapters, while summarizing his analysis he states that research concerning the role of music therapy in reducing fear is small in number and the results are contradictory. One of the studies showed a significant decrease of the level of fear in children during dental treatment (Parkin, 1981); in another the efficacy was slight and statistically insignificant (Davila and Menendez, 1986); and in still another a moderately positive effect of applying some indefinite type of music was described (Corah, 1981) [19]. Such an inconsistent picture may result from analyzing a small number of publications describing the early investigations in the development of music therapy, the main reason being the difficulty in the cooperation between the research teams of different fields in interdisciplinary endeavors. Some authors, including Little, classify music therapy as unconventional and alternative medicine in its application in dentistry [20]. In order to avoid such an approach to this type of therapy, it is necessary to conduct credible scientific research with elements of music therapy, showing its efficacy in clinical trials, which is also suggested by the authors described above [20].

The reduction in the level of anxiety in the dentist’s office may also be used as an element of a broader therapeutic intervention. Loster conducted research in which the decrease of anxiety while in dental procedures with the application of a program including elements of music therapy was also used as a mechanism indirectly reducing the experience of pain [21]. The aim of the study was to prepare and clinically test the efficacy of an analgesia program, combining elements of informative character with suggestion and relaxation. It was assumed that pain relief in this program would be based on the reduction of anxiety, apprehensiveness, fear, tension, and hyperexcitability. All the patients underwent a procedure of tooth preparation with vital dental pulp. An individual program consisting of music and the spoken word was recorded onto a cassette tape and delivered to the patient by means of headphones. The program consisted of two parts: hypnotic suggestion and relaxing electronic instrumental music. The application of this program was dictated by a conviction of the usefulness of such a non-invasive method of relieving pain, especially in situations...
when pharmacological intervention was contraindicated and the anxiety element before painful treatment was dominant [21]. On the basis of patient reactions, the intensity and discomfort of pain were recorded on a ten-point visual analogue scale. Very good results were achieved, with 94% of the patients reporting the effectiveness of the analgesia program [21]. Similar positive results showing the efficacy of passive music therapy are described in Teodorczyk and Bereziewicz [5, 14, 15]. Collecting more information about the conducted research on the application of elements of music therapy in dental environments would require an analysis of other unpublished works in available databases. The gaps in scientific evidence result mainly from the issues connected with conducting interdisciplinary controlled trials and the possibilities of having a large enough population sampling. An in-depth analysis of this problem requires the implementation of qualitative research methods, which are not widespread in medical environments. The results of the studies analyzed above could facilitate other future achievements in this area, which in turn could contribute to the development of research on this method of therapy in the future.

The presented results of experimental research demonstrate that using music therapy in reducing anxiety in dental patients may bring positive results. The analysis of the studies sheds light on different possible approaches to music therapy, from the perspective of therapeutic methods, types of procedures, or the possibility of combining music therapy with other psychotherapy techniques in reducing dental fear and anxiety. In the analyzed studies, music plays a supplementary function, contributing to the standard clinical procedures with the elements of relaxation, calmness and diverging the subject’s attention from the stressful stimuli in the dentist’s office. However, it also requires the patient to become engaged in the process of perception and as such, can be viewed as a non-verbal communication channel between the dentist and patient with anticipatory anxiety, as it influences the patient’s imagination by absorbing his or her thoughts.

CONCLUSIONS

The above systematic review is an outline of the methods of music therapy as applied to reducing the level of fear in dental patients. It is a method of confirmed efficacy, based on the EBM regulations. Music therapy can be a highly effective complementary method contributing to the traditional clinical procedures in integrated dentistry. However, further research should be undertaken in order to confirm its efficacy and to create standards for medical professionals. So far, there is no uniform and systematized approach to the above-mentioned clinical intervention, which would facilitate widespread application of this method by practicing doctors. There is a need for an increased number of randomized clinical trials, which would enable the creation of a basis for developing an algorithm of music therapy intervention, so that it could be widely implemented by dentists in cases of patients suffering from anxiety.

CITE THIS AS


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**TABLES**

Table 1. Results of analyzed experimental studies with elements of music therapy in dentistry

Legend:
- C – control group
- MT – experimental group, the use of music therapy program in dental treatment
- STAI x1 – (State-Trait Anxiety Inventory–State) anxiety as a state before and after the treatment
- STAI x2 – (State-Trait Anxiety Inventory–Trait) anxiety as a trait
- CDAS – (The Corah’s Dental Anxiety Scale) – the scale of dental anxiety
- mCDAS – individual modification of the CDAS scale (The Corah’s Dental Anxiety Scale) for the purpose of surgical treatment
- HAO – (Hierarchical Anxiety Questionnaire) – a hierarchical questionnaire of anxiety (before the treatment)
- DR – (Dentist Rating of patients adjustment to initial treatment) – the level of patients’ adjustment to the dental treatment
- PR – (Patient Rating of tension) – tension during dental treatment
- NDBC – (Negative dental behaviors checklist) – a checklist of negative behaviors at the dentist’s
- SDE – (Sensory adapted dental environment) – adapted dental environment for sensory perception
- RDE – (Regular dental environment) – standard dental environment
- TAW – vibration-acoustic therapy
- SBP – systolic blood pressure
- DBP – diastolic blood pressure
- HR – heart rate
- vs – versus
- NS – (Not Significant) – statistically not significant
- p – (p-value) – statistical significance of the test
### Table 1. Results of Analyzed Experimental Studies with Elements of Music Therapy in Dentistry

<table>
<thead>
<tr>
<th>No.</th>
<th>Author (Country)</th>
<th>Type of Treat-Ment</th>
<th>Age of Patients (Years)</th>
<th>Number of Patients (Gender Structure)</th>
<th>Music Therapy Method</th>
<th>Methods of Measuring Anxiety Used</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lahmann (1) (Germany)</td>
<td>Procedure conserva-tive dentistry</td>
<td>&gt;18</td>
<td>67 (48M, 19F)</td>
<td>Gr. I (n=28): Type of music from the list of different styles and its volume chosen by the patient (MT); Gr. II (n=30): (C)</td>
<td>STAI-x1 before and after the treatment</td>
<td>After the treatment, STAI-x1: 41.3 ± 3.6 (MT), 41.9 ± 11.5 (C). The comparison with the HAQ scale showed the impact of MT on patients with medium and high level of anxiety. The biggest efficacy was noted for the medium level of anxiety.</td>
</tr>
<tr>
<td>2</td>
<td>Hui-Ling (2) (Taiwan)</td>
<td>Endodontic procedures</td>
<td>18-65</td>
<td>87 (48M, 39F)</td>
<td>Selection of patients for the study from STAI ≥40 before randomization: Gr. I (n=22): soothing music applied; Mozart's Piano Concerto No. 2 in C major, Beethoven’s Violin Romance No. 2 in F major, Haydn’s Serenade in F major and Beethoven’s Moonlight Sonata applied through headphones (MT); Gr. II (n=22): headphones put on the head without music (C)</td>
<td>The STAI scale before the treatment and every 10 minutes during the treatment; measures of heart rate, blood pressure and finger temperature were taken</td>
<td>Before the treatment, STAI-x1: 50.64 (MT), 49.73 (C). After the treatment, STAI-x1: 32.80 (MT), STAI-x1: 39.55 (C). A statistically significant difference between (MT) and (C) in the measurements of the finger temperature changes – larger increase in gr. (MT). In the other results no statistically significant differences were observed.</td>
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<tr>
<td>3</td>
<td>Shapiro (3) (Israel)</td>
<td>Scaling and polishing</td>
<td>6-11</td>
<td>19 (3M, 16F)</td>
<td>SDE method consisting of: - headphones with music and bass vibration connected to the dentist’s chair - RTG vest - LED lamp on the hygienist’s head, light directed at the work area, in child’s vision dimmed, fluorescent light (instead of traditional light), SDE compared to RDE. Some patients (n=10) underwent clinical procedure first in SDE, and during the next visit in RDE, whereas the other group in the reverse order</td>
<td>Change in the perception of anxiety before the therapy and after the examination. The arithmetic mean it was observed that: - in gr. I: decrease of 4.3; - in gr. II: decrease of 1.5; - in gr. III: decrease of 2.4; - in gr. IV: decrease of 1.9 (NS)</td>
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<td>4</td>
<td>Kucharz and (4) (Poland)</td>
<td>Filing down of abnormal teeth for crowns or bridges (n=10) and treatment of dental caries (n=25)</td>
<td>16-60</td>
<td>40 (14M, 26F)</td>
<td>Individual selection of music, including: Mozart, Bach, Schubert, Wielki, Gregorian Choruses, Carols, folk, rock and jazz music. Groups of 10 patients: Group I - TAW both before the treatment (30-min. session) and during the treatment; Group II: TAW only before the treatment (30-min. session); Group III: TAW during the treatment; Group IV: control group (no TAW)</td>
<td>Rating scale of the anxiety level from 0 (none) to 10 (high, obstructing dental treatment). No statistically significant differences between the groups were noted.</td>
<td>The study showed: better level of cooperation, reduced electrodermal activity, reduced level of excitability in SDE vs RDE. A positive result. NIDEC was observed, but no efficacy of the softened environment of the dentist's office vs regular environment was noted. No effect of sequence was observed, but the efficacy of SDE vs RDE in the duration and intensity of negative behaviors NIDEC was found.</td>
</tr>
<tr>
<td>5</td>
<td>Berezowska (5) (Poland)</td>
<td>Treatment of caries media and filling with amalgam resin</td>
<td>19-83</td>
<td>120 (60M, 60F)</td>
<td>Music program consisted of the following composers: Schumann, Saint-Saens, Ribić, Mozart, Canteloube, Rubinstein. Groups of 10 patients: Gr. I (n=10): treatment without the music program (C); Gr. II (n=10) – treatment with the music program</td>
<td>after the treatment the measurement of tension was taken with the PR scale</td>
<td>A significant effect of reduced tension during dental procedures was observed in patients participating in the music program (especially in the group of males).</td>
</tr>
<tr>
<td>6</td>
<td>Alken (6) (USA)</td>
<td>Conservative dentistry</td>
<td>4-6</td>
<td>45 (21M, 24F)</td>
<td>Gr. I (n=15): folk music; Gr. II (n=15) – relaxing music; Gr. III (n=15) – no music</td>
<td>1. North Carolina Behavior Rating Scale 2. Venham Picture Scale 3. CDAS 4. heart rate (HR)</td>
<td>No statistically significant differences between the groups were noted.</td>
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<tr>
<td>7</td>
<td>Kim (7) (South Korea)</td>
<td>Surgical removal of a retained mandibular third molar</td>
<td>&lt;40 and &gt;40</td>
<td>219 (122M, 97F)</td>
<td>Randomized sampling for: Gr. I (n=106): (MT); Gr. II (n=113): (C); Patients selected 10 favorite songs from the list including classical music, pop music, folk songs, hymns and Korean traditional songs (if patients chose less than five, they were asked to propose their own). For group (MT) the songs were played in random order from the moment of entering to the surgery office till the end of the surgery. There was a possibility for mid-surgery control of volume by the patient, adjustments of headphones and breaks if needed, in consultation with the surgeon</td>
<td>In gr. I (MT) statistically significant decrease in mid-surgery level of anxiety was observed in comparison to gr. II (C). The average level of anxiety (gr. I) CDAS: 15.47 ± 3.03 and 13.12 ± 3.54 during the treatment, and in gr. (C) CDAS: 13.15 ± 2.87 – increased to CDAS: 13.51 ± 3.11 during the treatment. The CDAS scale &gt; 13 pts indicates the level of anxiety high for both groups. No statistically significant relation between the stage of the treatment, and the changes in SBP, DBP, and HR comparing both groups (MT) and (C) was noted. Differences between HR (increase) and SBP (increase) group (MT) was observed, but they were within the normal physiological values.</td>
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<td>8</td>
<td>Gaworska (8) (Poland)</td>
<td>Procedures of dental surgery</td>
<td>7-15</td>
<td>130 (70M, 60F)</td>
<td>Randomized sampling for: Gr. I (n=100): 57 M, average age 9.6: (7-15) 43 F, average age 9.9: (7-15) – Musical preferences were established from fairy-tale music, disco, relaxing, electronic, and classical music; music applied during the treatment through headphones. Younger children usually opted from fairy-tale music, older children – pop music (MT); Gr. II (n=100): 53 M, average age 10.46: (7-15) – no music therapy was used (C)</td>
<td>After the treatment, subjective assessment of the level of anxiety (anxiety rating scale: 0 – lowest level; 6 – highest level of anxiety). The cut-off points for the level of anxiety: - low – 1 and 2 pts - medium – 3 and 4 pts - high – 5 and 6 pts</td>
<td>Level of anxiety low 58% (MT), 30% (C); medium 37% (MT), 40% (C), high 5% (MT), 30% (C). A statistically significant difference was observed in the reduction of the level of anxiety (p&lt;0.001).</td>
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<td>NO.</td>
<td>AUTHOR (COUNTRY)</td>
<td>TYPE OF TREATMENT</td>
<td>AGE OF PATIENTS (YEARS)</td>
<td>NUMBER OF PATIENTS (GENDER STRUCTURE)</td>
<td>MUSIC THERAPY METHOD</td>
<td>METHODS OF MEASURING ANXIETY USED</td>
<td>RESULTS</td>
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<tr>
<td>9</td>
<td>Green 1952 (9, USA)</td>
<td>Surgical procedures under local anaesthesia and premedication (n=139) and procedures of conservative dentistry (n=86)</td>
<td>20</td>
<td>205 (M &gt; F)</td>
<td>Patients listened to music during the treatment, they selected the music type (modern, classical, country) and style (dellicate, energizing) by themselves and controlled the volume of music.</td>
<td>Individual scale prepared by the author of the study: patients were divided into groups on the basis of questionnaire answers: 1) passive 2) middle level of anxiety 3) high level of anxiety 4) pathological anxiety</td>
<td>The examination helped many people to eliminate the fear of the dentist (the number of patients in the groups before and after the treatment): Gr.1: 69–104 Gr.2: 100–98 Gr.3: 36–13 Gr.4: 1–0</td>
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<td>10</td>
<td>Grzesiak- Janas 2004 (10) (Poland)</td>
<td>Dental surgery</td>
<td>25–73</td>
<td>46</td>
<td>Music was delivered with a stereophonic hi-fi equipment in an acoustically isolated room.</td>
<td>Gr. I (n=16) – patient chooses the music by himself, for instance: calm film music (n=8), dynamic film music (n=3), classical (n=2), rock (n=3) and listens to it before the extraction procedure before the anesthetic, and after anesthetic, for 5 minutes. Gr. II (n=30) – no music (C)</td>
<td>Gr. I: after the treatment there was observed: - decrease of pulse in 75% of patients - decrease of blood pressure in 81% - decrease of body temperature in 34% Group II: - decrease of pulse in 63% of patients - decrease of blood pressure in 69% - decrease of body temperature in 60%</td>
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<tr>
<td>11</td>
<td>Grzesiak- Janas 2004 (11) (Poland)</td>
<td>Dental surgery</td>
<td>11–80</td>
<td>180</td>
<td>Music was delivered with a stereophonic hi-fi equipment in an acoustically isolated room.</td>
<td>Gr. I (n=90), 37M, 52K - patient chooses the music by himself: from classical (n=27), jazz (n=5), calm film music (n=33), dynamic film music (n=11), rock (n=14) (MT). Music was delivered through the headphones. Gr. II (n=90) – no music (C)</td>
<td>Gr. I: after the treatment there was observed: - decrease of pulse in 74 patients, increase in 8 - decrease of blood pressure in 75 patients, increase in 5 - decrease of body temperature in 63 patients, increase in 2 - decrease in sweating in 65 patients, increase in 4</td>
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<tr>
<td>12</td>
<td>Miresh 2005 (12) (India)</td>
<td>Visits: 1–obtaining medical history and physical examination 2–prevention measures 3–treatment and dental restoration of cavities 4–tooth extraction</td>
<td>4–8</td>
<td>40</td>
<td>Veneer's picture test: 1–veneering procedure test; 2–veneering anxiety rating scale 3–Pulse 4–Satisfaction (3 and 4 taken with a pulsimeter)</td>
<td>In gr. II the patient chose the type of music himself, which was delivered through the headphones.</td>
<td>1. Venham’s picture test: - no statistically significant differences between the groups 2. Venham’s anxiety rating scale: - statistically significant differences only between groups B and C (higher result in gr. C) 3. Pulse: - highest in gr. A, the difference between A and B and C (NB) - the difference between groups B and C was statistically significant 4. Satisfaction: - minimal changes during all visits (NS)</td>
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<td>13</td>
<td>Otaszewska, Żarow 2003 (13) (Poland)</td>
<td>Tooth extraction procedures, dental restoration, tooth preparation for prosthetic crown</td>
<td>18–72</td>
<td>200 (80M, 120F)</td>
<td>Patients not listening to music: The PR scale: level of anxiety low 47%, medium 44%, high 9%. The DR scale: level of adjusting to the procedure high 50%, medium 50%. Patients listening to music: The PR scale: level of anxiety low 79%, medium 21%, no high. The DR scale: level of adjusting to the procedure high 85%, medium 12%. The highest level of anxiety in patients was observed in surgical procedures, lower in prosthetic treatment and the lowest in conservative dentistry procedures.</td>
<td>100 patients during dental treatment listened to classical music.</td>
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<td>No.</td>
<td>Author (Country)</td>
<td>Type of Treatment</td>
<td>Age of Patients (Years)</td>
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<td>14</td>
<td>Teodorczyk 2005 (Poland)</td>
<td>Procedure of tooth extraction</td>
<td>20-75</td>
<td>90 (37M, 53F)</td>
<td>Music was delivered to the patient two times for 5 minutes before the anesthetic and tooth extraction and after the tooth extraction. 34.5% of patients chose music at random, whereas 65.5% as a conscious choice, including classical music (30%), jazz (5.5%), calm film music (36.6%), dynamic film music (12.5%), rock (10.5%). Before applying music therapy the measures of blood pressure, pulse, body temperature were taken. The paleness of the face was assessed together with the subjective perception of skin sweating.</td>
<td>- subjective feelings of patients in relation to music therapy: positive 68.9%; neutral 28%; no negative</td>
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<td>15</td>
<td>Bereziewicz 2011 (Poland)</td>
<td>Tooth extraction due to orthodontic and periodontal indications in patients with medium and high level of anticipatory anxiety (n=80)</td>
<td>17-77</td>
<td>80 (38M, 42K)</td>
<td>A specially designed music program was used before and during dental procedures. The program was built on the basis of musical parameters analysis. Group I (C) – control group 40 subjects – without the music program, Group II (MT) – experimental group 40 patients – listening to the music program before and during dental treatment. A change in the perception of anticipatory anxiety was observed after patients from group (MT) listened to the music program before and after the procedure, in comparison with group (C). The measurements of anxiety CDAS (C)=10.39, (MT)=10.87 and mCDAS (C)=16.1, (MT)=16.72 for both groups before the treatment did not show differences. Also, the groups (C) and (MT) did not differ in the quotient of STAI x1 anxiety to STAI x2 anxiety before the treatment. A significant decrease was noted in STAI x1 after relaxation (p&lt;0.001) and after treatment (p&lt;0.001). Mean score results for STAI x1 before the treatment (C)=46.9, (MT)=49.5, after relaxation (MT)=36.1; after treatment (C)=40.4, (MT)=39.9. A significant correlation was observed between the groups (C) [low in 7.5%; medium in 45% and high in 47.5%] and (MT) [low in 45%; medium in 47.5%, and high in 7.5%] for the PR scale. The progress of the dental procedure in patient’s subjective assessment is more comfortable and less painful in the experimental group in comparison with the control group. In patients’ self-rating of the comfort level after the treatment in group (MT) the lack of willingness to continue the treatment was not noted, in comparison with group (C). In group (MT) patients showed the signs of increased energy, satisfaction and willingness to cooperate. With varying degrees of intensity, 100% of patients in group (MT) the music program before the tooth extraction procedure had a positive influence on the patient’s feelings. In group (MT) music helped to forget about the unpleasant feelings during the procedure of tooth extraction in 95% of patients, whereas 5% remained indifferent.</td>
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