

Music as a Complementary Approach to Controlling Primary Headache

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Abstract *Objectives:* Headache is one of the most common complaints in patients due to physical and mental Problems. Music intervention is proven to have an effective role on reducing and tranquilizing pain intensity in patients. To our knowledge, there is a paucity of evidence for the benefit of music therapy in headache management. The objective of this review was to evaluate the use of music as a complementary approach for primary headache control. *Method:* Five electronic data bases (Pubmed, Scopus, Science direct, EMBASE, and Central) from 2000 to January 2018 were searched using various keywords: “Tension- type headache”, “Migraine”, “Sound therapy”, and “Music therapy” including the word (and) between these words. Studies were included based on the following criteria: (1) the participants were individuals with TTH and migraine headache; (2) studies assessed headache management; (3) studies assessed the effectiveness of music therapy on these two kinds of headaches. Studies were excluded if participants had any type of secondary or other primary headache and music therapy was not evaluated. *Results:* Search results identified 19 articles. After manual review of abstracts, 6 of these articles met the inclusion criteria. *Conclusion:* The combined findings of these articles provide support for the use of music as a complementary, cost effective, and noninvasive approach to the routine care of patients with primary headaches, yet more validated scientific research is still required to explore information about the types of music, optimum duration, and dose of the music with best impact on individuals’ treatment. Further researches should address this issue. The findings of this review are expected to have important implications for clinical settings.

Keywords Pain, Tension-type headache, Migraine, Music therapy

1. Introduction

Pain is one of the most common complaints and subjective phenomena in patients due to physical and mental Problems. [1] It has serious impact on health status, quality of life, work, social performance and societal costs. [2, 3] Headache is a common type of pain with the most prevalent neurological disorders. [4] It can be subdivided into primary (Tension-type headache, Migraine, and Cluster headache) and secondary headaches which can have their own set of symptoms, reasons and different kinds of treatment. [5]

Tension-type headache (TTH)

With a focus on Tension-type headache (TTH) as a non-vascular form of primary headaches, it can be said, TTH is attributed to abnormalities in peripheral and central

nociceptive systems in combination with environmental and genetic factors that takes place over hours to days. [6] Environmental and psychological factors (depression, anxiety and stress) are indexed for the development of TTH. [7] It has long been recognized that TTH has high socio-economic impact with a life time prevalence in the general population ranging between 30% and 78% in different studies. [8, 9] With respect to middle age groups, TTH remains more prevalent in women (27.1%) than men (25.6%). [10, 11] One survey by Schawrtz and colleagues on the general population in the United States indicated that episodic tension-type headache with an annual prevalence of 38.3% was highly persistent in many patients. [12]

Migraine headache

Migraine as a complex neurovascular form of primary headache, typically lasting 4-72 hours, often considerably reduces social activities and quality of life. [13] It is felt an autonomic feature, including nausea, vomiting, and loss of appetite. [14] It is important to note that genetic predilection would be the main reason as a casual factor underlying the migraine headaches. [15] Interestingly, the incidence of migraine in most Western Societies was estimated about 12%

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of population. [16] Based on three large epidemiological studies, 17.6% of females and 5.7% of males were affected by migraine attacks in the United States. [17] It is sub-classified into common migraine (without aura) and classic migraine (with aura). [18]

Music therapy

To manage these headaches with mild to moderate degree, both pharmacological and non-pharmacological preventive therapies are recommended as alternative and complementary treatments, respectively. The provision of complementary therapy (relaxation therapy, cognitive therapy, music therapy, and meditation), as non-invasive, safe, and inexpensive way to reduce symptoms of headache in many people who are reluctant to use traditional treatment methods or concerned about the toxic effects of the medicines, is primarily the domain of the first line treatment. [19-22] Music therapy as one of the oldest and complementary technique is known to have been used with the aim of promoting a mind-body interaction without side effects. [23] Mechanistically, music has a practical role through the entertainment of body rhythms [24, 25], by releasing of endogenous opioids and dopamine, and changing in hormone modulation. [26] Chlan [27] reported salient features of this recovery positive model of medical treatment, it is easy to apply and to use; it is cost-effective; it does not have adverse effects.

Subsequently, the influence of music therapy on headaches became the basic of study. In a previous study, music has been shown to have positive role in the treatment of adults with headache. [28] Thus far, in research conducted by Koeing et al [29] to examine the impact of music therapy among patients with chronic painful conditions, it was found that listening to music decreased pain scores.

Although aforementioned studies provide important implications regarding the effects of music therapy on headaches, little attention has been paid to especially randomized controlled trial for evaluation possible effects of music on patients with TTH and migraine. The aim of this review paper is to provide an overview on the impact of music therapy as a conservative management for patients with TTH and migraine.

2. Method

Search Strategy

Five electronic data bases (Pubmed, Scopus, Science direct, EMBASE, and Central) from 2000 to January 2018 were searched by applying the following title keyword search terms: "Pain", "Tension-type headache", "Migraine", and "Music therapy".

Inclusion / Exclusion criteria

Studies were included based on the following criteria: (1) the participants were individuals with TTH and migraine headache; (2) studies assessed headache management; (3) studies assessed the effectiveness of music therapy on

these two kinds of headaches. Studies were excluded if participants had any type of secondary or other primary headache and music therapy was not evaluated.

Data Extraction and Analysis

Data extraction was performed on all articles according to inclusion criteria as (1) the participants' characteristics, (2) headache assessment, and music therapeutic management of headache assessment.

3. Results

Search results identified 19 articles. After manual review of abstracts, 6 of these articles met the inclusion criteria, [28-33] among which 2 articles [28, 29] were found in the reference list. The protocol of this review is presented as a flow diagram in Figure (1).

Main Findings

All selected studies reported a significant correlation between using music therapy and a reduction in TTH and migraine pain intensity and severity. [28-33] Among described studies, Risch et al [28] conducted a study in a group of 34 adults suffering from chronic headache using several self- rating scales before the music therapy, after music therapy and within a 6 to 12 month follow-up and reported that all patients had less frequency of pain in the follow-up. Moreover, music therapy did not appear to have lasting side effects. In another study conducted in 2008, Oelkers-Ax et al [30] investigated the efficacy of music therapy for children with migraine in a three-arm parallel-group study (music therapy as a psychotherapeutic treatment, butterbur extract and placebo as two medication treatments) with a follow-up assessment six months after the end of treatment. This study had 4 intervention phases: 8-week baseline phase; 12-week treatment phase; 8-week post treatment and 8-week follow-up phase. A total of 58 patients aged between 8-12 years enrolled in this randomized controlled trial, reported an initial onset of migraine 1 year before the start of the trial and experienced an average of two or more migraine attacks. The music therapy group received 15 hours of music therapy with one weekly session for 3 months. According to final results, pain levels were significantly reduced during the post-treatment ($P < .005$) on the days music was received compared with the placebo days, whereas during the follow-up phase both music therapy group and butterbur root group had significantly lower pain scores ($p = 0.018$ and $p = 0.044$, respectively) than placebo group. Additionally, all groups experienced a substantial reduction in pain compared with their baseline measurements. Researchers also reported music therapy as a conservative and prophylactic approach can improve headache and its related disabilities. In this respect, Sinha [31] reported similar findings in a study conducted in a group of 40 patients with tension-type headache. The participants were divided into subgroups taking into account the type of headache management. One

group was exposed to pharmacological assessment and the other group received self-selected music sessions for the next six months along with pharmacotherapy. After listening to music adjunct to pharmacotherapy, in the second group, a number of headache index decreased significantly at the end of six months. One pilot study [29] was found in the primary- headache population. Music intervention was provided for the 19 patients of the study ranging in age from 12 to 17 years old who were diagnosed with either a tension-type or a migraine headache. The study group received two dose-frequency modes of treatment (standards vs compact). During standard treatment (12 weekly session over three months), patients listened to music for 50 minutes each session whereas in compact treatment (12 session within one week). The results showed reduction of headache intensity over time differed significantly when compared to the pre-treatments in both alternatives but there was a small effect on headache frequency. One study [32] in Turkey was identified in which Turkish music was administered to decrease pain in subjects with primary headache. This experimental study included 43 patients 14 to 81 years and lasted for 3 weeks. The experimental group listened to live music which supposed not to have been listened by the group before, once a week within three week-period. The music therapy plan classified as active (relaxation exercises) and passive (just hearing) techniques. A questionnaire was related to the therapy process were obtained after the music sessions. Finally, the study group demonstrated higher

satisfaction with their hospital and emotional experience (thinking positively, relaxing, feeling at peace and reducing the pains). In order to support the assertion between using music and reduction in primary headache intensity and severity, the last randomized, attention-placebo- controlled parallel group trial consisted of 71 patients between the ages of 12 and 17 years was conducted. [33] According to the International Classification of Headache Disorders (ICHD-II), patients were reported with one or multiple diagnosis having migraine without aura, migraine with aura, chronic migraine, frequent episodic TTH or chronic TTH. The study was divided into 4 phases: an 8-week baseline assessment; an 8-week treatment phase (6 sessions of 90 minutes each), an 8-week post treatment assessment phase (post-line), and 8- week follow-up assessment phase (6 months after the end of the treatments phase. Patients were randomized to two groups. The first group (34) was encourage to use the music therapy and the second one (37) use rhythm pedagogic program as an “attention placebo” measurements were obtained immediately before and after treatments. Data collection indicated significant reduction (50%) of both headache frequency and intensity after treatment as well as a time to follow-up with the subjects, in both groups.

Information about music therapy as an adjuvant intervention for primary headache is presented in Table 1 and 2.

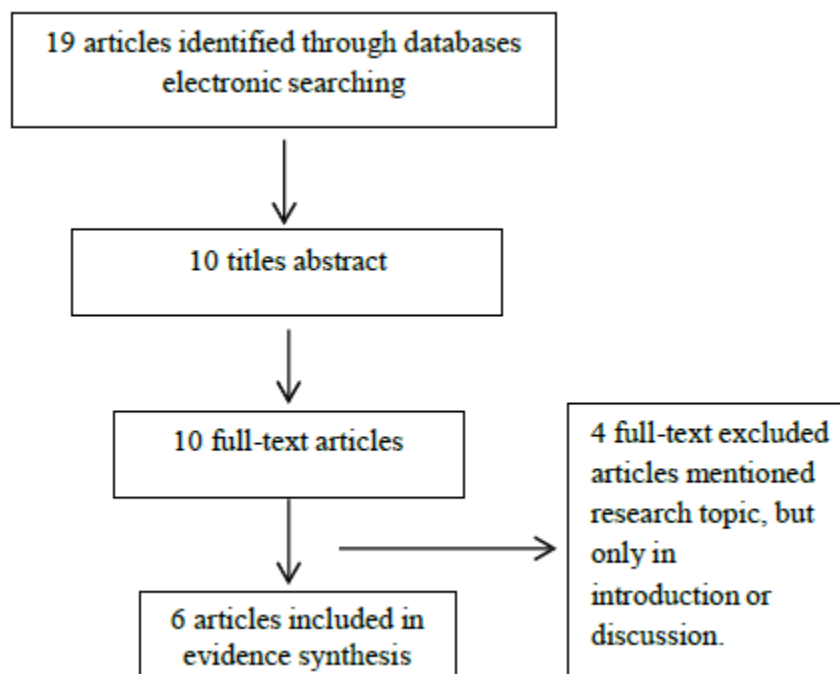


Figure 1. Flow diagram of the review protocol

Table 1. Evidence table for selected studies

Author (Year)	Sample size	Independent variables and measures	Dependent variables and measures	Main outcome
Risch et al. (2001)	34	Music- based engagement was provided by a music therapist during treatment	Headache experience and psychological variables measured with self-rating scales before the treatment, after the treatment and within 6 to 12 month follow-up	Headache frequently was found to be significantly reduced
Oelkers-Ax et al. (2008)	58	Music group received 15 hours of music therapy with one weekly session for 3 months	Demographic variables migraine attacks, interval headaches and psychological belief in effectiveness of intervention obtained by diagnostic interview	Significant improvement in headache- related disability was found
Sinha (2011)	40	Music was played for the six months along with pharmacotherapy	Pain measured by Headache index, Visual analogue and Headache diary	At the end of six months, headache did not exist in any patients
Koenig et al. (2013)	19	Study group listened to music during 50 minute procedure in two modes of treatment (standards Vs compact)	Participants were asked to rate their pain from pre to post treatment	Statistically effect was found in both treatment groups on acute pain intensity but a small effect on headache frequency
BurÇin UÇaner (2013)	43	Active music (relaxation exercise) and passive music (just hearing) were played once a week within three week-period	Patients were asked questions regarding their hospital and emotional experience	Patients reported higher satisfaction after music therapy sessions regarding headache days
Koenig et al. (2013)	71	Music group listened to music during 90-minute in treatment assessment phase	Headache and pain were measured by an 11-point Likert-type scale. The Kiddie- Sads-Present and Lifetime version (K-SADS-PL) was used to assess Psychiatric problems. Behavioral and Emotional problems were also reported	A moderate mean reduction of headache frequency and intensity was observed

Table 2. Evidence table for selected studies

Author (Year)	Types of music therapy	Treatment points	Adverse events
Risch et al. (2001)	Receptive music	n.r.	No
Oelkers-Ax et al. (2008)	Receptive and active music	Music supported activation of cognitive and emotional resources	No
Sinha (2011)	Receptive music	n.r.	No
Koenig et al. (2013)	Receptive music	Music regulated emotional symptoms	n.r.
BurÇin UÇaner (2013)	Receptive music	Music makes think positively with induction of relaxation	No
Koenig et al. (2013)	Receptive and active music	Music increased physical perception and expression	No

n.r.; not reported
 receptive music; just hearing
 active music; client makes music

4. Discussion

The experience of headache and its management are major issues in clinical practice. It is prudent to manage headache and relevant problems when they are deemed significant. Some patients may wish to avoid treating their headache with drugs (e.g. analgesics) which can compromise quality of life due to their side effects. Hence, it is a general recommendation to consider the potential adverse effects of pharmacological treatment. Music has been proven as a valuable complementary modality in clinical situations to reduce the frequency and severity of headache, and limit reliance on medications. Music can be effective not only for headache management but also for improvement of quality of life. A reasonable interpretation is that music influences the mind and body with reducing blood pressure, heart rate,

stress, depression, and anxiety levels among patients. Additionally, it can decrease high doses of some drugs which most commonly associated with adverse effects. [34, 35] Moreover, being a noninvasive, inexpensive, and non-time-consuming intervention, music provides its specialized using as a complementary technique in a therapeutic setting.

To our knowledge, there are not many studies taking into account the effect of music therapy on primary headaches. The mechanisms of the relationship between music therapy and headache problems are not yet fully understood. This first review aimed to improve our understanding of headache disabilities to scrutinize the possible role of music therapy in headache management.

The present review study has some limitations. First, some of the included articles had no any balancing factors

between control and experimental group, and also there is not enough description of experimental design in some studies. Another limitation, concerns about no mention of reliability and validity for the scales used for assessment of headache and several measures were patients' self-reported which could have affected some response bias in terms of researchers' presence. Moreover, it is a limitation that there is allowance of self-selection of music in one study which could potentially have produced a biased change scores. Therefore, to avoid accepting a false hypothesis, enough attention should be paid to these restrictions in future research.

It may seem straightforward that there is abundance great number of studies on primary headache management but specific information regarding the relationship between primary headache management and music therapy is scarce. Hence, future studies should consider measurements of headache and music in patients using valid and reliable interventions in order to describe more details of the relationship. Overall, due to the complexity of variety of music experiences (e.g., active music making vs. receptive music listening), [36] further studies are needed to explore the types of music, optimum duration, and dose of the music with best impact on individuals' treatment. The body of knowledge in this area would benefit to develop strategies to promote headache management of techniques.

5. Conclusions

By analyzing qualified studies, it can be concluded that music as a simple and straightforward approach has numerous profound effects not only in headache management but also for social effects with having a large emotional component. These effects may have important implementation for the use of music therapy for headache rehabilitation in people needs to be considered carefully.

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