

# Musical interventions and music therapy in pain treatment: literature review

## *Intervenções musicais e musicoterapia no tratamento da dor: revisão de literatura*

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### ABSTRACT

**BACKGROUND AND OBJECTIVES:** Music therapy is an approach that promotes positive effects on cognitive, emotional, psychological and social aspects, favoring quality of life. It also helps to control psychological and physical symptoms, such as anxiety, depression, and pain, as well as promoting relaxation, pleasure, and the strengthening of interpersonal relationships. The influence of music on pain is still a topic with little clarifying results in the literature. The aim of this study was to investigate the effects of musical interventions and music therapy in the treatment of acute or chronic pain.

**CONTENTS:** Literature review of the last 10 years was carried out in the LILACS and Scielo databases between August and September 2020, which included articles of literature review or systematic review.

**CONCLUSION:** Music can reduce pain, however, the results show that there is controversy in the studies analyzed on the analgesic role of music on pain. There is controversy about the effects of music therapy or musical interventions on pain, as well as its adverse or side effects. This may be related to the methods and their results with low scientific evidence.

**Keywords:** Analgesia, Complementary therapies, Pain, Music, Music therapy, Therapeutics.

### RESUMO

**JUSTIFICATIVA E OBJETIVOS:** A musicoterapia é uma abordagem que promove efeitos positivos sobre a cognição, os aspectos emocionais, psíquicos e sociais, favorecendo a qualidade de vida. Também ajuda a controlar sintomas psíquicos e físicos, como ansiedade, depressão e dor, além de promover o relaxamento e o prazer, bem como fortalecimento das relações interpessoais. A influência da música na dor ainda é tema com resultados pouco esclarecedores na literatura. O objetivo deste estudo foi investigar os efeitos das intervenções musicais e da musicoterapia no tratamento da dor aguda ou crônica.

**CONTEÚDO:** Foi realizada revisão da literatura dos últimos 10 anos nas bases de dados LILACS e Scielo entre agosto e setembro de 2020, a qual incluiu artigos de revisão da literatura ou revisão sistemática.

**CONCLUSÃO:** A música pode minimizar a dor, porém, os resultados mostram que há controvérsia nos trabalhos analisados sobre o papel analgésico da música sobre a dor. Há controvérsia sobre os efeitos da musicoterapia ou de intervenções musicais sobre a dor, bem como sobre seus efeitos adversos. Isso pode estar relacionado aos métodos e seus resultados com baixa evidência científica.

**Descritores:** Analgesia, Dor, Música, Musicoterapia, Terapêutica, Terapias complementares.

### INTRODUCTION

Music therapy is a valuable complementary strategy that influences neurocognitive, emotional, psychic and social aspects, resulting in a positive impact on quality of life<sup>1</sup>. It also helps to control psychological and physical symptoms, such as anxiety, depression, and pain, as well as promoting relaxation, pleasure, and the strengthening of interpersonal relationships<sup>2</sup>. Music therapy favors the construction of humanized environments in health care<sup>3</sup>.

The results of research investigating the influence of music on pain are controversial. Scientific studies are scarce, showing the importance of conducting research with methods of high scientific evidence<sup>4</sup>.

So far, little is known about the effects of music as a pain treatment. Therefore, the present study was concerned with investigating the following research question: is the therapeutic application of music or musical elements, in the listening modality, capable of alleviating or modulating pain phenomena?

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A literature review observed that the prevalence of chronic pain in the Brazilian population ranges from 29.3 to 73.3%<sup>5</sup>, that is, a serious public health problem. Chronic pain impairs functionality, can lead to depression and suicide<sup>6</sup>. Thus, to better understand the use of non-invasive, low-cost and widely available techniques, such as music therapy, can have an extremely relevant impact on public health. In this sense, the objective of this study was to investigate the effects of musical interventions and music therapy in the treatment of acute or chronic pain, using Latin American based bibliogra-

phic research, taking into consideration the lack of scientific information about music therapy and pain. Therefore, the aim was to develop literature review research.

### CONTENTS

For this literature review, a search was conducted in the LILACS and Scielo databases between August and September 2020 with the terms “music therapy” and “pain”. Inclusion criteria: articles of literature review or systematic review, published in Portuguese, Spanish, and English, presenting a complete, free access, online version, and those still in the process of publication (Epub ahead of print), published no more than ten years ago. Exclusion criteria: any inadequacy to the objectives of the present study and its keywords after reading the title and abstract.

The results are shown in figure 1 and table 1.

The selected scientific articles will be discussed with other works present in the literature.

### GENERAL BENEFITS OF MUSIC

Music therapy is an approach that seems to have positive impact on several symptoms and needs, improving the quality of life of individuals in palliative care<sup>10</sup>. There is evidence of positive results of music in pain reduction. The benefits of using music in health services have been observed in reducing anxiety, improving breastfeeding, labor, enhanced coping and family support, facilitating non-verbal expression, low cost, and decreasing psychopathological behaviors<sup>4</sup>.

Music can positively interfere with vital signs and pain perception in hospitalized patients, reducing pain and lowering blood pressure and respiratory rate. It's a low-cost, effective, pleasant, and accessible therapy, including to employees and companions<sup>11</sup>.

Intervention with music therapy is an effective option in the treatment and prevention of depressive symptoms, as well as in improving quality of life<sup>12</sup>.

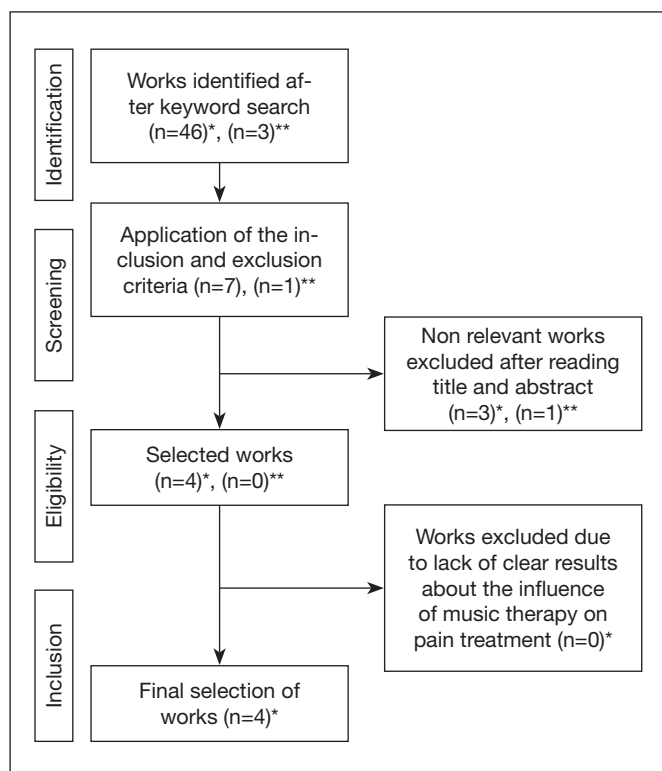


Figure 1. LILACS\* e Scielo\*\* databases search flowchart

Table 1. Distribution of literature review articles selected from the LILACS database

Authors	Objectives	Results and conclusions
Liberato et al. <sup>7</sup>	Evaluate the available information on nursing interventions for venous ulcer pain management.	A study with one group of patients who listened to relaxing music and another group with music of the patient's preference during the dressing change procedure: there was pain reduction immediately after dressing change when listening to music of preference. Because there was no statistical significance, the conclusion was that there was no reduction in pain.
Mascarenhas et al. <sup>8</sup>	Identify studies on the efficacy of non-pharmacological methods to reduce pain in laboring women in the national and international literature.	An experimental randomized study showed that after the first hour of labor there was a significant reduction in pain. Another experimental randomized study found that pain scores were significantly lower when compared to the control group, and that the results of music therapy were similar to those of cryotherapy. The conclusion was that music promotes relaxation and decreases levels of anxiety.
Santee et al. <sup>4</sup>	Analyze information about the use of music as a care strategy by health professionals.	There is reduction in pain during colposcopy and labor, but also pain in general.
Quiroz Torres and Melgar Hermoza <sup>9</sup>	Study the unconventional support techniques for controlling children's behavior during dental care.	One study found increased satisfaction and decreased pain sensation with treatment. Another study states that, although listening to music does not seem to be effective in reducing pain, anxiety, and uncooperative behavior in pediatric patients, patients reported that they really enjoyed listening to music during the visit.

## POSITIVE VERSUS NEGATIVE EFFECTS OF MUSIC

There is controversy about whether there are adverse effects, side effects, or contraindications to music therapy or music interventions. One study states that music is a good resource for reducing preoperative anxiety, with no adverse effects, and should become a routine in the search for a more humanized practice in health care<sup>13,14</sup>. Another study indicates that music may have, in some occasions, a calming effect or, in others, a mobilizing effect on the most intense human emotions<sup>14</sup>. Other researchers state that musical intervention does not present contraindications or side effects. The nature of the effects of music seems to be beneficial for most people, as it provides a sense of well-being, relaxation, distraction, pleasant memories, and comfort<sup>11</sup>. However, particularly in older adults, some manifestations may interrupt the therapeutic process during the application of music, such as tiredness, hunger, or drowsiness<sup>1</sup>. The therapist can use resources that arouse the patient's interest, such as an adjuvant element in the process<sup>14</sup>. Music can bring back memories and past experiences, evoke different feelings, and promote non-verbal communication. It provides a healthy environment for the client and favors the professional client relationship<sup>1</sup>. In the case of animals submitted to surgery, the *Prelude in E minor, opus 28, number 4*, by Frédéric Chopin, resulted in a decrease of postoperative pain, achievement of normal levels of heart and respiratory rates and food consumption, as well as weight maintenance<sup>15</sup>.

## METHODOLOGICAL CHALLENGES IN MUSIC AND PAIN

Deeper research on non-pharmacological treatments, with better methodological design, increasing the level of evidence of the studies, is needed<sup>16</sup>. Although there is evidence of its benefits, the heterogeneity of studies makes the application of music therapy difficult<sup>17</sup>. The positive results achieved in several studies show the importance of expanding scientific research, with a larger number of participants and more time allotted to music therapy interventions, as well as the inclusion of a control group<sup>12</sup>. Statistically insufficient results may compromise the analysis and the conclusion on the effects of music on human health<sup>7</sup>. Studies are scarce and research in older adults is even rarer, making it important to conduct studies with methods of high scientific evidence<sup>4</sup>.

Although music seems to reduce pain<sup>4</sup>, the demonstration of this benefit was not very clear in the presented studies. Studies with low scientific evidence methods make it difficult to obtain reliable results on the use of music and pain reduction<sup>7</sup>. In an article that analyzed non-pharmacological treatments, music therapy was a category inserted in "other methods", along with reflexology, aromatherapy, and breathing techniques<sup>8</sup>. To include music with other methods may not be appropriate from the methodological point of view, since each type of intervention is different and can act on the neuronal circuits in a number of ways, thus bringing particular results.

## MUSIC APPLIED TO CHILDREN

Music therapy can reduce the intensity level of postoperative pain in children submitted to surgery<sup>18</sup>. Music therapy applied to children undergoing dental treatment can reduce anxiety for two reasons: when listening, the children close their eyes to concentrate on the sound, and the sound of music itself will eliminate unpleasant noises from dental instruments and equipment. The relaxing effect of music is also associated with this. Some researchers define music therapy as a type of suggestion technique that encourages fantasy and relaxation through music, particularly in children. The choice of audio should be appropriate to the child's age<sup>9,19</sup>. Any non-pharmacological technique for behavioral management of the child, including music therapy, should be applied according to the type of treatment and mental and/or physical state<sup>9</sup>.

## MUSIC APPLIED TO OLDER ADULTS

In the older adults with Alzheimer's disease, music can be perceived as an instrument of great value for retrieving memories of lived experiences. The retrieval of recent memories justifies the influence of music, since there is loss of recent memory in the initial stage of this disease. The evocation of feelings such as happiness and longing, expressed through smiles, applause, and crying can also be noted. Thus, the contribution to non-verbal communication is very important. Music can be a new way of care that is different from conventional care. Music, by providing a healthy environment, values the older adults and strengthens their interaction with the healthcare professional<sup>1</sup>.

In institutionalized seniors, it was observed that music therapy contributed positively to their quality of life, allowing them to recover the playful, emotional, spiritual, and sensitive aspects, a practice that promotes dignity of life and humanization<sup>3,4</sup>. In older adults with dementia, music therapy showed improvement in anxiety, apathy, and agitation. Cognitive improvement is controversial. Music interferes with the individual's attention to his or her pain, modulating the perception of the painful stimulus, according to the pain gate theory. Music therapy is relevant for improving the quality of life of people with dementia. These people face daily the difficult coexistence with their symptoms and with the several negative consequences that affect the social sphere; therefore, the emergence of a promising therapeutic option, free of adverse effects, can mean hope for facing the difficulties of this disease in a milder way<sup>20</sup>.

## MUSIC IN INTENSIVE CARE UNITS

Non-pharmacological therapies should be implemented in the multidisciplinary treatment of ICU patients, favoring the rehabilitation process from a different perspective. Pharmacologic treatment for pain control must be reconsidered from different points of view, one includes the adverse effects that drugs have on patients unable to clearly express their pain, generating systemic level alterations due to their dosage<sup>16</sup>. Thus, music therapy in the treatment and assessment of people in coma and in minimally conscious states constitutes a more humanized practice in the hospital environment<sup>4</sup> and shows some evidence of good results, although the

subject deserves further investigation<sup>17</sup>. The inclusion of this subject in professional education allows humanizing healthcare services, reducing sedation times and doses, and encouraging teams to apply alternative methods that enable integral care<sup>21</sup>.

## MUSICAL LISTENING: MUSICAL TYPES

About the effects of sacred music, no statistically significant difference in spiritual well-being between the experimental groups and the control group was observed. However, there is a trend toward improved levels of spiritual well-being in mourning family members<sup>22</sup>. Piano sounds and beach waves are played to calm parturients, considering fear and anxiety as parts of the pain. Culturally upbeat and religious music has been shown to be beneficial for the Turkish population<sup>8</sup>. The patient's music listening preference seems to be relevant in the treatment<sup>7</sup>. The combined intervention of Mindfulness-based Stress Reduction and music therapy was helpful in reducing pain, anxiety and sleep disturbances in patients with osteosarcoma. These findings provide evidence that this combination may be an effective non-pharmacological intervention for future clinical care<sup>23</sup>.

## APPLICABILITY OF MUSIC IN THE CLINICAL SETTING

In light of the current evidence basis and the favorable risk-benefit ratio of music therapy, clinical practice guidelines recommend consideration of music therapy for pain management - level of evidence C<sup>24-26</sup>. The implementation of non-pharmacological treatments, including music therapy, although not the essential strategy for pain control, can be considered as an adjuvant. The implementation of educational strategies with health professionals is suggested, increasing their applicability. Likewise, it's important to establish interdisciplinary groups that generate intervention proposals for the management of painful conditions, based on evidence and promoting the implementation of non-pharmacological strategies that contribute to the patient's well-being<sup>16</sup>. It's important to expand the use of music in health services due to its benefits and low cost<sup>4</sup>. Despite the great importance identified in the use of complementary therapies, these therapeutic modalities are still not so much inserted in the context of assistance given to palliative care patients in Brazilian health institutions<sup>2</sup>. Complementary therapies, including music therapy, which has been shown to reduce anxiety, must be incorporated into educational activities in primary care, resulting in a more humanized health care<sup>4,8</sup>.

## CONCLUSION

Music, used as a therapeutic strategy in the listening modality, can promote pain relief, although the scientific evidence is weak. There is controversy about the positive or negative effects of music therapy or musical interventions in pain treatment, although there is evidence of psychic and humanistic benefits. The scarcity of works in the literature, according to the researched bases, and the use of heterogeneous methods, as well as methods of lesser power of scientific evidence, make it difficult to understand the results and, therefore, these effects on pain, which represents a limitation of

the present study. There is no clear information about clinical protocols for the application of music, which hinders any comparison between studies, therefore, this subject deserves further research. Although there is no consensus, analyzing the studies shows that music or sound stimuli with musical elements, melody, rhythm and harmony applied by trained or untrained professionals for therapeutic purposes, can be understood, simply, as a music intervention/procedure in health, a music-based intervention/procedure or even music medicine, since the execution of these stimuli is random or generic. Music therapy should be performed by a trained professional using the musical elements specifically for each patient through a therapeutic relationship, requiring evaluation, diagnosis, and a specific treatment proposal.

## AUTHOR CONTRIBUTION

### Thiago Medina Brazoloto

Data Collection, Research, Methodology, Writing - Preparation of the original, Writing - Review and Editing

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