IAMM 2020
Online Conference

Biological effects of music in cancer patients: contributing to an evidence-based practice

Gunnar Taets*, Christian Taets, Lucas Torres, Caroline Fernandes
E-mail*: master@ufrj.br

Objective

The objective of this study is to investigate the biological effects of the use of music in patients with cancer already described in literature.

Method

The PICO[3] strategy was used to elaborate the question "What are the biological effects of music in patients with cancer?", by which it was considered as Problem the patients with cancer; Intervention for music therapy; as Control patients who were not submitted to any therapy or who were submitted exclusively to conventional therapies - chemotherapy, radiotherapy, surgical resection of the tumor, among others; and as Outcome any biological effect related to the intervention, estimated either by questionnaires answered by the patients, or by biochemical and molecular tests or standardized scales of symptom assessment.

Then, the electronic search was done by two independent researchers using the descriptors "music" and "cancer" and the Boolean connector "and", being included among the results clinical studies, clinical trials, comparative studies, meta-multicenter studies, randomized controlled trials, systematic reviews and observational studies of the last ten years with complete and free text available in Portuguese, English or Spanish in the following databases: PubMed, Virtual Health Library (BVSalud) and CAPES Thesis Bank. The articles selected were those that addressed specific biological effects of the use of music as therapy in patients with malignant neoplasms. Subsequently, articles that were cited in more than one database were excluded and all references to eligible publications were analyzed. Thus, by grouping and analyzing results of primary studies carried out in different places and times by independent research groups, we integrated existing information on the subject, allowing the generation of scientific evidence from 30 articles that composed the study sample.

Results and Discussion

Reduction of anxiety

Cancer provokes fear, anxiety and other emotional state disturbances that initiates symptoms capable of affecting the patients and their relatives.[20] Anxiety is intensified between medical consultations as well as during the realization of laboratory tests and medical procedures, both of which alter the patient's biochemical profile, including increased levels of cortisol and adrenalin, for example.[24,30]

North American and Canadian articles observed, likewise, improvement of pediatric patients with cancer's mood and pattern of anxiety.[17,18,19,33] A clinical study involving children attending ambulatory care to cancer disease follow-up exposed patients to 20 minutes of music in their second consultation, being the control group composed by the same patients, in their first consultation. It was attested promotion of comfort and relaxation after the intervention.[26] An American systematic review evaluated the effects of music, along with other complementary therapies, on anxiety, mood disturbances, pain, quality of life and the incidence of collateral effects caused by conventional cancer therapies in patients with lung cancer, concluding the complementary therapies have positive effects on all the variables mentioned.[13] A German study analyzed the impact of the intervention with art therapy, music therapy and dance on patients undergoing chemotherapy for breast cancer and concluded that those who were exposed to 15 minutes of music therapy during chemotherapy sessions for two weeks presented improvement in quality of life and of anxiety levels.[16]

Improvement of depression

The effects of using music in mood and depression improvement in patients with cancer have been discussed throughout the last decades, as described by this review.

Among the seven studies that composed the sample to this analytic category, five demonstrated benefits of the use of music therapy in oncologic patients with depression and two suggest the elaboration of more accurate studies so that such benefits might be specifically recommended. A Brazilian systematic review registered positive impacts of music therapy on mood, evaluating the total of 1.891 patients with cancer.[28]

North American systematic reviews gathered positive results of the use of music in patients with cancer and depression as well[27] and described that women with cancer treated with music therapy after total mastectomy demonstrated significant improvement of depression, measured by the General Questionnaire e by the Chinese version of Zung Self-rating Scale for Depression.[22]

Nevertheless, active music therapy, in the same studies, although related to immediate effects in the group under intervention, did not presented sustained results over time. Studies that compare directly the effects of active and passive music therapy are needed in order to comprehend whether the benefits come specifically from a technique or another.

Easing of acute or chronic pain

In order to reach the reduction of pain perception, the type of music therapy and the type of song may influence the results. According to a dutch study, songs chosen by the patient reduce the perception of pain because of comfort and familiarity sensations, whilst unknown songs produce results, preferentially, through cognitive mechanisms, instead of emotional.[14] A Brazilian integrative reviews corroborates the potential of familiar songs as it proposes, observing experiences in diverse studies, that nurses offer songs known by the patient to complement their analgesia.[28] Another Brazilian study, however, worked with previous choice of the song to be applied - Spring, from Vivaldi's Four Seasons, denoting, still, pain easing. The hypothesis includes the distraction from pain and the pituitary stimulation to release of endogenous opioids.[32] One more Brazilian study supports the first hypothesis, affirming that music acts as a competitive stimulus against pain, because it redirects a person's attention, modulating pain stimulus unconsciously.[29]

The use of music to reduce oncological pain is still questioned by some authors. A German randomized clinical trial did not verify significant differences in pain perception between control group and the group which received music therapy.[9]

Variations on cardiorespiratory parameters

Concomitant to mood variations that lead the patient with cancer to anxiety symptoms, there are cardiorespiratory variations due to the activation of sympathetic autonomic nervous system, which occurs in cases of stress. Frequent effects of conventional therapies are: arterial blood pressure, cardiac frequency and respiratory frequency raises. Complementary therapies may be useful to control these variations, which can accentuate anxiety disorders. Studies justify music effects on cardiorespiratory parameters based on the increase of endorphins and/or catecholamines release after listening to music.[17]

Reduction of fatigue

Fatigue has a prevalence of 80-90% between patients with cancer treated with chemotherapy or radiotherapy.[36] It consists of a subjective sensation of tiredness, which is disproportionate to the level of physical and mental activities. The nature of fatigue in oncological patients is related mainly to the effects of both the disease and treatment on central nervous system, but psychiatric, endocrine and cardiac causes cannot be discarded. These causes are not all reversible and drug treatments against fatigue are commonly inefficient.

In the meantime, although referring improvement of fatigue in various studies analyzed, a Chinese overview of systematic reviews points that there are not sufficient results to provide strong recommendations in favor of music therapy.[15] A North-American study relates a small to moderate effect of treatment with music therapy on fatigue, without strong evidences of physical functioning improvement in general. The use of more accurate oncological fatigue evaluation tools and the treatment of its reversible organic causes might facilitate a more proper analysis of music effects on this symptom.

Conclusion

Considering the integrality needed in patients with cancer's treatment and the frequent diagnosis of the disease in advanced stages, the approach must value quality of life, even in palliative care contexts. Before the evidences of reduction of anxiety, improvement of depression, easing of acute or chronic pain, variations on cardiorespiratory parameters and reduction of fatigue through the use of music in the context of oncological disease, such strategy stands out as an effective therapeutic possibility, noninvasive and of low costs.

It is proposed that music be more diffused as adjuvant intervention in the management of patients with cancer. Future research that corroborate and question the obtained results in selected populations can contribute to the construction, in hospitals and other host services to oncological patients, of a scenery in which music is part of a more integral, effective and humanized health care.