



EFFECTIVENESS OF MUSIC THERAPY ON ANXIETY LEVELS AND SLEEP QUALITY IN CANCER PATIENTS: A SYSTEMATIC REVIEW

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ABSTRACT

Cancer is a major global cause of death. Cancer patients have a great sense of anxiety about their illness, which has an impact on their sleep quality. Music therapy intervention is one of the non-pharmacological therapies that can be given to cancer patients. It is important to identify the effectiveness of music therapy in reducing anxiety and improving sleep quality in cancer patients. Method: Journals and articles were searched using five databases ProQuest, EBSCOHost, Pubmed, ScienceDirect, and Sage Journal. The author selected several relevant journals and articles from 2010 to 2023. The results of the search of 11 articles found that music therapy interventions proved effective in reducing the stress levels of cancer patients. Music therapy can also improve the sleep quality of cancer patients. Music therapy is effective in reducing anxiety and improving the quality of sleep of cancer patients.

Keywords: anxiety; cancer patients; music therapy; sleep quality

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INTRODUCTION

Cancer is a major global cause of death. Cancer incidence and mortality rates are increasing and alarming, with more than 19 million new cases and 609,820 deaths reported by 2023 (Bray et al., 2018). This signifies a considerable increase with more than 5 million additional cases and 2 million deaths exceeding the figures recorded in 2012. In fact, these numbers are predicted to increase further to around 23.6 million new cases by 2030 (Badheeb et al., 2023). Undesirable side effects of treatment during cancer therapy management can aggravate anxiety levels, increase depression levels, and intensity of pre-existing pain associated with cancer treatment, the diagnosis process, as well as the entire treatment process required. It is important for cancer patients to have all these needs met in a balanced way to be healthy. Sleep is one of the basic human needs that must be fulfilled. Humans spend approximately one-third of their lives sleeping (Kavurmaci, Dayapoğlu, & Tan, 2020).

There are several complementary treatments for psychological symptoms such as relaxation therapy, hypnosis, meditation/mindfulness, yoga and acupuncture, includes music therapy. Music therapy is a therapy with a psychosocial approach that can complement intervention of diseases such as cancer, as alternative medicine. Therapy for sleep disorders that occur in cancer patients can consist of non-pharmacological and pharmacological therapies. Non-pharmacological therapy was then developed considering the side effects of pharmacological therapy, one of the non-pharmacological therapies is music therapy (Lestarini & Putra, 2018).

Music has been used in hospitals as a therapy from the past to the present. Music therapy affects areas in the human brain related to emotions such as happiness, joy, anger, and hatred and has important effects on humans (Gao et al., 2019). Music affects the brain's nervous system, modulating endogenous opioids and oxytocin resulting in relaxation and well-being (Li et al., 2020). Music therapy has therapeutic effects that can speed up or slow down breathing and change a person's internal state, then affect heart rhythm and blood pressure, reduce muscle tension and improve movement and coordination (McConnell & Porter, 2017). Reducing anxiety in patients with cancer has positive effects on their physical and mental health (Sun et al., 2023). Based on this description, the authors are interested in identifying the effectiveness of music therapy in reducing anxiety and improving sleep quality in cancer patients.

METHOD

Literature search on online database by starting the identification using the research question, "What is the effectiveness of music therapy on anxiety and sleep quality of cancer patients?". The approach was carried out with PICO, where P (patient): Cancer patients, I (Intervention): music therapy, C (comparison): None, O: Effectively improve sleep quality and reduce anxiety levels. The search for articles and journals started from 2010 until 2023.

This systematic review used PRISMA (Preferred Reporting Items for Systematic Reviews and Meta Analyses) in selecting literature sources, to describe the effectiveness of music therapy in reducing anxiety and improving sleep quality in cancer patients (Egger, Higgins, & Smith, 2022).

Eligibility Criteria

This literature review was made by collecting various references with the criteria; have Abstract and *Full Text*, search type in the *database* with journal articles *Randomized Controlled Trial* (RCT) research design related to nonpharmacological interventions in reducing anxiety and improving sleep quality, published in English.

Search Strategy

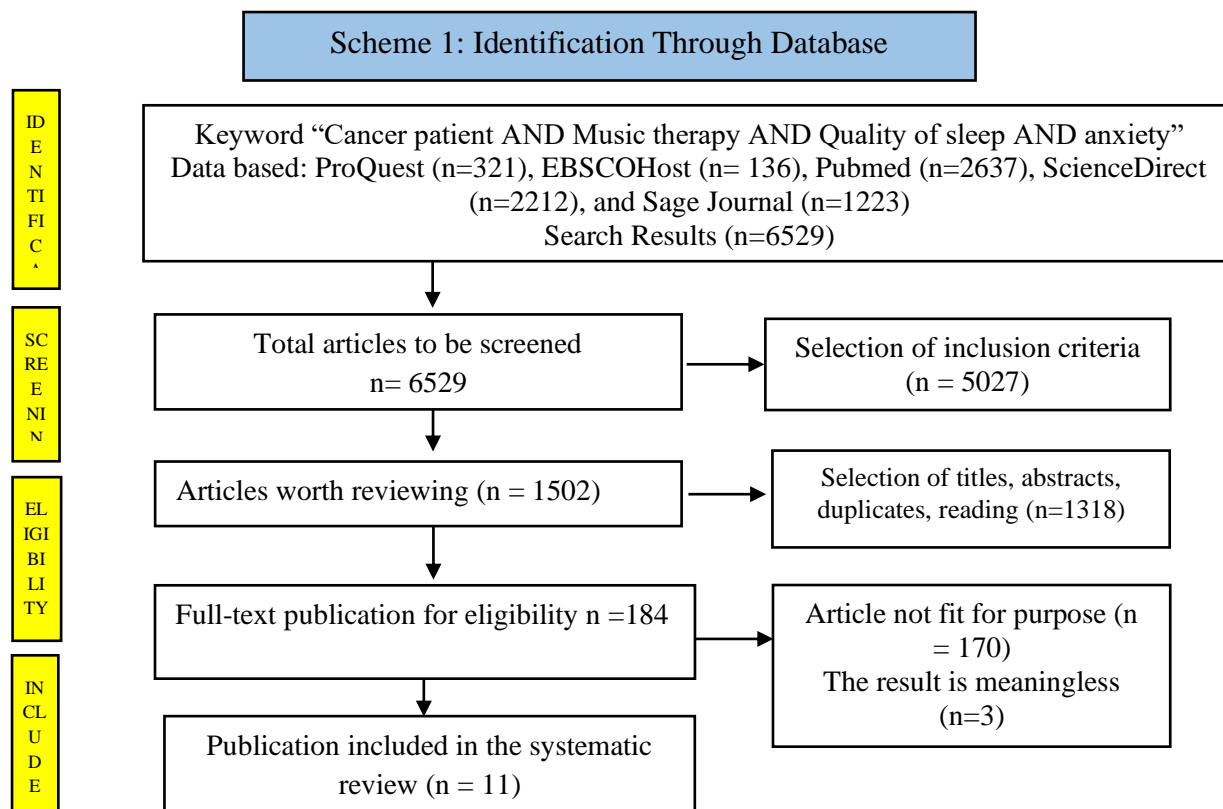
The author conducted several searches for relevant journals and articles by entering the keywords created in the matrix map "*Cancer patient OR patient with cancer OR oncology patients AND Music therapy OR Music Intervention OR Musical Therapy OR Music-based intervention OR therapeutic music AND Quality of sleep OR sleep quality OR sleeping pattern AND anxiety OR anxiety level OR reduce anxiety*". The search for articles and journals started from 2010 until 2023. This literature review used PRISMA's guided analysis to describe the effectiveness of music therapy on cancer patients' anxiety and sleep quality.

Literature Selection (Study Selection)

The search for journals and articles used relevant *databases* such as ProQuest, EBSCOHost, Pubmed, ScienceDirect, and Sage Journal. The author selected several relevant journals and articles. The selection results of the reviewed literature can be seen in scheme 1.

Synthesis of Results

The findings of this systematic review are to describe and explain the effectiveness of music therapy in reducing anxiety levels and improving sleep quality in cancer patient.



RESULTS

The results of the review of 11 articles that fit the topic, objectives and inclusion criteria show that music therapy can improve sleep quality and reduce anxiety levels in cancer patients, which can reduce anxiety, pain scale and improve sleep quality in SCLC cancer patients (Tang et al., 2021). Music therapy is also effective in improving sleep quality and reducing anxiety and fatigue in cancer patients (Patchaiappan & Angelline, 2023). Music therapy can significantly reduce patient anxiety during radiation simulation procedures based on the STAI-S and SDT questionnaires (Rossetti et al., 2017). Music therapy in instrumental form is effective in reducing anxiety compared to no music (Latif et al., 2020). Passive music therapy can efficiently relieve lung cancer patients' anxiety during peripherally inserted central catheter placement (Mou, Wang, Xu, Liu, & Li, 2020). Music therapy is also effective in pediatric patients with leukemia where anxiety scores were lower in the music therapy group both before and after the lumbar puncture procedure (Nguyen, Nilsson, Hellström, & Bengtson, 2010). Music therapy is also effective with Nadayoga music therapy for 12 weeks can reduce anxiety and improve the quality of life of ovarian cancer patients (Malik et al., 2023).

Music therapy can be combined with Virtual Reality (VR) so that music therapy can overcome anxiety and improve emotional conditions in breast cancer patients during chemotherapy. However, VR intervention seems to be more effective than music therapy in relieving anxiety, depression, and fatigue (Geyik, Doğan, Ozbek, & Atayoglu, 2021). If music therapy is combined with aromatherapy, it will be very effective in reducing cancer patients' anxiety (Deng, Xie, Liu, Li, & Xiao, 2022). The combination of music therapy and mindfulness-based stress reduction also significantly alleviates clinical symptoms, and can be considered a novel psychotherapeutic intervention that effectively reduces pain and anxiety scores and improves sleep quality in patients (Liu, Gao, & Hou, 2019).

The quality of the reviewed articles was assessed by applying The Joanna Briggs Institute (JBI) Critical Appraisal tool for randomized controlled trial designs which consists of 13 main question items. The results of the journal quality assessment using the JBI tool on the 11 articles included in the review above are in the high and medium quality categories so that they fall into the quality criteria of the articles reviewed.

Table 1.
Summary of Article Extraction and Analysis results (n=11)

No	Authors	Article Title	Aim/goal	Intervention	Sample and Design	Results
1	Haoke Tang & Liping Chen & Yichun Wang & Yongchan gZhang & Nong Yang & Ning Yang (ProQuest)	The efficacy of music therapy to relieve pain, anxiety, and promote sleep quality, in patients with smallcell lung cancer receiving platinum-based chemotherapy	Assess the effectiveness of music therapy on pain, anxiety and sleep quality in SCLC lung cancer patients undergoing platinum-based chemotherapy.	The control group is 50 and the intervention group is 50 patients, in the intervention group 6-step music therapy is given, while the control group does not receive any music therapy.	A total of 100 patients with SCLC cancer undergoing platinum-base chemotherapy RCT Design	Music therapy can reduce anxiety , pain scale and improve sleep quality of SCLC cancer patients.
2	Kamala Patchaiappan, Kripa Angelline (ProQuest)	Music Therapy on Cancer Related Fatigue, Quality of Sleep and Anxiety	Assessing the effect of music therapy on fatigue, anxiety and sleep quality in cancer patients	The music therapy intervention played in 20-30 minutes twice a day for one week every day in the experimental group and in the control group was given psychological support with frequent communication between nurses and patients.	A randomized control trial was used among 60 cancer patients using probability simple random sampling technique. Cancer patient were randomly selected and distributed into experimental groups as well as control groups	Music therapy has been shown to be effective in improving sleep quality, reducing anxiety levels, as well as reducing fatigue in cancer patients.
3	Deng C; Xie Y; Liu Y; Li Y; Xiao Y (EBSCOhost)	Aromatherapy Plus Music Therapy Improve Pain Intensity and Anxiety Scores in Patients With Breast Cancer During Perioperative Periods: A Randomized Controlled Trial	To investigate the effects of perioperative aromatherapy (AT) and music therapy plus (IVIT) on pain and anxiety level	Standard therapy, music therapy, aromatherapy or a combination of aromatherapy and music	The sample used was 40 breast cancer patients pre and post breast surgery with general anesthesia, RCT Design	Music therapy mixed with aromatherapy is very effective to reduce anxiety of cancer patients
4	Chirico A; Maiorano ; Indovina ; Milanese ; Giordano GG; Lucidi F; Botti G;	Virtual reality and music therapy as distraction interventions to alleviate anxiety and improve mood states in breast	Assess the effectiveness of immersive and interactive VR in reducing cancer patients' psychological	The patient listens to relaxing music for 20 minutes, The patient uses the VR system for 5-10 minutes to get used to it, and then the nurse	A total of 94 female patient with breast cancer. Study design with external controlled trial	Interventions using virtual reality and music therapy have been shown to be beneficial in reducing anxiety

	De Laurentiis ; Giordano (EBSCOhost)	cancer patients during chemotherapy	burden on chemotherapy	administers chemotherapy.		levels and improving mood in breast cancer patients during chemotherapy sessions
5	Geyik Gİ; Doğan S; Ozbek H; Atayoglu AT. (EBSCOhost)	The effect of music therapy on the physical and mental parameters of cancer patients during hematopoietic stem cell transplantation	Investigating the effect of music therapy on the physical and mental condition of cancer patients during hematopoietic stem cell transplantation (HSCT) procedures	During the transplant process, the patient receives Music Therapy which is part of the Islamic Turkish Traditional Culture. The patient's physical and psychological parameters were evaluated before and after the music therapy session	A total of 30 hospitalized patients were included in the study design with single-arm trial pattern	Music therapy has a major effect in increasing oxygen saturation levels and reducing anxiety levels. This shows that music therapy has a positive impact on cancer patients.
6	Andrew Rossetti, Manjeet Chadha, MD, Nelson Torres, MPH, Jae K. Lee, Donald Hylton, AAS, Joanne V. Loewy, Louis B. Harrison (PubMed)	The Impact of Music Therapy on Anxiety in Cancer Patients Undergoing Simulation for Radiation Therapy (Rossetti et al., 2017)	Evaluating the effectiveness of music therapy on anxiety in patients with head and neck or breast cancer undergoing radiation therapy	Patients were randomized to an intervention group where music of the patient's choice was played during the radiation simulation. Patients who did not participate in music therapy were not included in music therapy consultations, nor were they exposed to music recordings during simulations.	Of the 78 patients enrolled (39 in the MT group and 39 in the no-MT group) 38 had breast cancer and 40 had head and neck cancer. RCT study design	Music therapy significantly decreased patient anxiety during radiation simulation procedures
7	Aulia Insani Latif Nurun Salaman Alhidayat, Satria Hanggara Putra, (ScienceDirect)	Effectiveness of music therapy in reducing the level of anxiety among cancer patients undergoing chemotherapy (Latif et al., 2020)	Assess how effective music therapy is in reducing anxiety levels in cancer patients undergoing chemotherapy	Music therapy	Sixty cancer patients who were undergoing chemotherapy were divided into two groups, with 30 participants in the control group and 30 participants in the interventional group. RCT study design	Instrumental music therapy has been shown to be effective in reducing anxiety levels when compared to without the use of music

8	Qianqian Mou, Huiqiong Xu, Xia Liu, Junying Li (Sage Journal)	Effects of passive music therapy on anxiety and vital signs in lung cancer patients undergoing peripherally inserted central catheter placement procedure	Assessing the impact of passive music therapy on anxiety levels and vital signs in patients with lung cancer	Music therapy and standard care measures were given to the intervention group, and standard care measures were given to the control group.	There were 30 patients with central catheter insertion procedures. The passive use of music therapy effectively reduces anxiety levels in lung cancer patients. RCT research design
9	Thanh Nhan Nguyen, RN, MSc, Stefan Nilsson, RNT, PhD (Sage Journal)	Music Therapy to Reduce Pain and Anxiety in Children With Cancer Undergoing Lumbar Puncture: A Randomized Clinical Trial	to evaluate whether music therapy affects pain and anxiety	Musical intervention is applied before, during, and after the lumbar puncture procedure	Pediatric patients with leukemia in the music therapy group, anxiety scores were lower both before and after the procedure. RCT research design
10	S. Malik. Sehrawat. Kumari, SI Barnwal, Kalra, R. Singh, P. Bhardwaj, Dogra, (ScienceDirect)	430MO Impact of Nada yoga music therapy on anxiety and quality of life in ovarian cancer patients: A randomized controlled trial (Malik et al., 2023)	Assessing the effect of Nadayoga music on anxiety management and Quality of Life (QoL) in ovarian cancer patients undergoing chemotherapy	Nada yoga music was recorded by the researcher and sent to both groups via a customized Android app developed for this study	Ovarian cancer patients undergoing chemotherapy over a 12-week period resulted in reduced anxiety levels and improved quality of life in patients suffering from ovarian cancer. Administration of Nadayoga music therapy RCT research design
11	Haizhi Liu, Xiurong Gao, Yuxin Hou (PubMed)	Effects of mindfulness-based stress reduction combined with music therapy on pain, anxiety, and sleep quality in patients with osteosarcoma (Liu, Gao, & Hou, 2019)	Evaluating the effects of mindfulness-based stress reduction (MBSR) combined with music therapy (Sarvestani et al.) on clinical symptoms in osteosarcoma patients.	The intervention group received eight sessions of MBSR psychotherapy and music therapy, while the control group received no psychological intervention	Osteosarcoma patient. The combination of MBSR with MT significantly alleviated clinical symptoms, and can be considered as a new psychotherapeutic intervention that effectively reduces pain and anxiety scores and improves sleep quality. RCT research design

DISCUSSION

Music is an art form, which can affect a person's soul, emotions, social and physicality. (Suryana, 2018). Therefore, music therapy can play a crucial role in improving various mental, emotional, physical, and social aspects. These interventions enhance interactions between individuals and create a harmonious atmosphere, which may play a role in reducing anxiety levels. In addition, Music therapists direct and encourage patients to focus and follow the rhythm of the music, thus distracting them from the side effects of treatment. Music has also been shown to progressively relax muscles, which can lead to relaxation and bring about positive changes in the patient's state of mind (Kavurmaci, Dayapoğlu, & Tan, 2020). The New Zealand Society for Music Therapy (NZSMT) states that music therapy has proven its effectiveness in the health field, as music can reduce anxiety, pain, stress, and create positive feelings. In principle, almost any type of music can be utilized in music therapy. However, it

is important that we understand the influence of each type of music on the mind. Each tone, melody, rhythm, harmony, timbre, form and style of music will affect our mind and body differently (Hohmann, Bradt, Stegemann, & Koelsch, 2017).

This systematic review shows that music therapy is effective in cancer patients in reducing anxiety and improving sleep quality. In this study, all research articles showed significant improvements in sleep quality and anxiety. Research ii included randomized control trial articles with samples consisting of patients with breast cancer, head and neck cancer, lung cancer (SCLC) and undergoing platinum-based chemotherapy, and general cancer attending oncology clinics. The findings of this study can be additional evidence for health workers to understand the effectiveness of music in supporting patients' clinical conditions. Music therapy can be applied in waiting rooms and hospital inpatient rooms. Current clinical practice guidelines recommend the use of music to address cancer-related psychological burden during and after treatment (Patchaiappan & Angelline, 2023). Nevertheless, the precise mechanisms by which music engagement contributes to mental health are still unknown.

Music therapy shows effective benefits in breast cancer patients in reducing negative emotional feelings and improving quality of life and can be a good nonmedical treatment option in the treatment of oncology such as breast cancer (Hohmann et al., 2017). In a study using a randomized controlled trial of anxiety in cancer patients, it was found that music therapy was able to reduce levels of anxiety and depression, as well as improve the quality of life of patients with cancer. Music therapy is a low-risk, flexible and cost-effective intervention that can improve anxiety in patients with cancer (Sun et al., 2023).

Research results show that music therapy can help patients improve their positive attitude towards the disease by regulating emotions and managing symptoms (Sun et al., 2023). The benefits of music therapy have also been studied to effectively improve the spiritual well-being of palliative care patients compared to its effects on quality of life, pain, and psychological distress (Huda, Banda, Liu, & Huang, 2023). Music therapy employs a variety of musical dimensions intentionally selected by music therapists to enhance the physical and mental health of cancer patients. Through engagement in music therapy, terminally ill cancer patients in palliative care naturally redirect their focus towards enjoyable activities, aiding in alleviating stress and expressing emotions that might be challenging to articulate verbally. In addition, the effectiveness of music therapy has been shown to mediate spiritual healing and fulfill spiritual needs (Huda et al., 2023).

CONCLUSION

Based on this systematic review, it can be concluded that music therapy has benefits in overcoming anxiety and improving the quality of sleep of cancer patients. However, the results were not consistent across all studies. Music therapy is one of the easy, efficient and practical therapies to be given to cancer patients. Music therapy can be used in anxiety management and alternatively in improving the quality of sleep of cancer patients.

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