



Research Article

Effectiveness of Music Therapy on Pain, Anxiety, Depression and Quality of Life among Patients with Cancer - a Systematic Review of Randomized Controlled Trials

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Abstract

Background: The study of music therapy's effectiveness on anxiety, pain, quality of life, fatigue and depression as well as its incorporation into clinical practice, promotes evidence-based nursing. **Objectives:** The aim of this study is to examine the effects of music therapy on pain, anxiety, depression, quality of life and fatigue in cancer patients. **Methods:** The researchers used the PRISMA statement to review 20 studies published between 2011 to 2020. Patients undergoing Music Therapy (MT), during/after surgery, chemotherapy, radiotherapy, or palliative care were included in research studies if they assessed at least one outcome of pain, depression, anxiety, quality of life and fatigue. **Results:** Music therapy has a favourable effect on the outcome measures of pain, anxiety, depression, quality of life and fatigue among patients with cancer. **Conclusion:** Music therapy is effective in improving the outcome measures in cancer patients, but further studies will help to determine the effects of music intervention in supportive cancer care.

Keywords: Music therapy; Anxiety; Pain; Depression; Fatigue; Quality of life; Cancer

Introduction

Cancer is the most serious non-communicable disease, causing stress in both patients and their families. It affects a person's physical, physiological, emotional, and social well-being. Music therapy is a simple and cost-effective method for cancer survivors to reduce stress, anxiety, pain, and despair while also increasing their quality of life. Because as cancer progress pain increases which cause psychological and physiological deterioration [1].

Music and sound are used in music therapy to help people express their emotions and promote their emotional and physical well-being [2]. Music therapy includes listening to music or playing simple instruments. When cancer patients listen to music, they feel a lot better because it is tranquil and relaxing. Music stimulates the release of dopamine, which helps patients with cancer feel good, and endorphins, which induces happy moods and relieves pain. It also stimulates the release of oxytocin and leads to a positive and happy feeling. Music therapy is usually offered for 30-60 minutes per day for weeks or months at a time.

Objective: Examine the effects of music therapy on pain, anxiety, depression, exhaustion, and quality of life among patients with cancer.

Materials and Methods

Data Sources: The investigators selected the research studies by search strategy using the phrases such as “music treatment for cancer, music therapy in patients with cancer and influence of music on cancer patients”. The databases included studies published between 2011 and 2020 from CINAHL, MEDLINE, Cochrane, and PubMed. In order to ensure specificity and replicability, the databases were reviewed over a period of 3 months. Later a librarian validated it. A three-step search procedure was used. 1) a limited search of CINAHL, MEDLINE, and PubMed; 2) a thorough search of all included databases using all selected keywords; and 3) a manual search of the reference lists of included articles.

Criteria for selection: Inclusion criteria:

- All randomized-controlled studies among adult patients with cancer.
- Studies focused on the effects of music therapy on anxiety, pain, pain and anxiety, anxiety and depression, improving psychological outcomes that included anxiety, pain and fatigue, depression, exhaustion, and quality of life.

- Studies published in English from peer-reviewed journals.

Exclusion criteria:

- The studies on effectiveness of music therapy combined with other complimentary therapies such as naturopathy, acupuncture and aromatherapy.
- Qualitative, cross-sectional studies, case reports, dissertations and thesis.

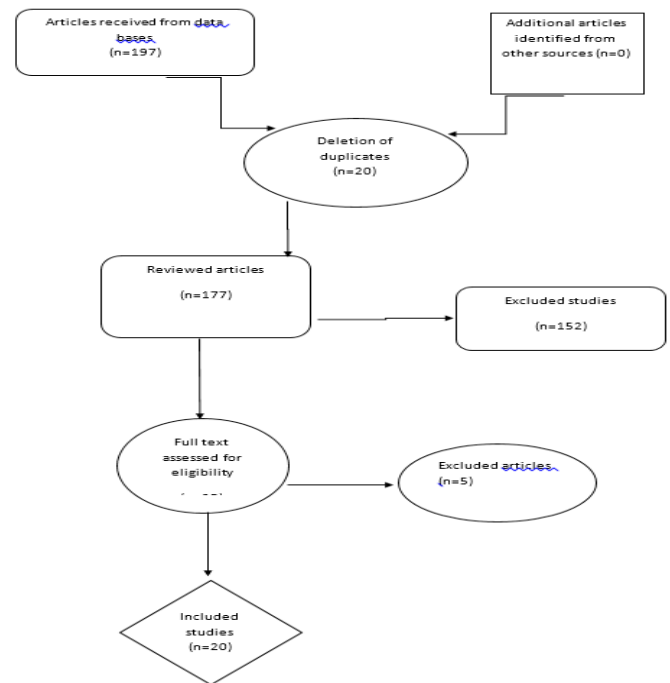


Figure 1: PRISMA diagram for strategy of the study selection.

Results: The flow chart (Figure 1) represents the selection and reasons for deletion. 20 studies that met the inclusion criteria were included in this review. Out of 20 included articles, 45% (n=9) were RCTs; 50% (n=10) were SRs and 5% (n=1) were mixed methods. Note, about 90% of these studies were on the effects of music therapy on pain, anxiety, depression and exhaustion and 10% were on effects of music therapy on quality of life among cancer patients.

S.No	Author & Year	Title	Sample size	Results
1. 1	Palmer JB, Lane D et al., (2015)	Music Therapy's Effects on Anesthesia Requirements and Anxiety in Women who had Ambulatory Breast Surgery for Cancer Diagnosis and Treatment	207	Greater reduction in the pre operative (P<.001) anxiety score and shorter recovery time (P=0.018) [16].
2. 2	Krishnaswamy P, Nair S (2016).	The Impact of Music Therapy on Cancer Patients' Pain and Anxiety	14	When comparing the test group to the control group, there was a statistically significant reduction in post-intervention pain scores (P = 0.034). The reduction in anxiety levels after intervention was not statistically significant in either group [10].
3. 3	Bradt J, Dileo C (2016).	The effects of music on cancer patients' psychological and physical parameters	52 trials with a total of 3731 participants	<ul style="list-style-type: none"> The findings suggest that music interventions may reduce anxiety in cancer patients, with a reported average anxiety reduction of 8.54 units (95 percent CI -12.04 to -5.05, P=0.0001) on the Spielberger State Anxiety Inventory - State Anxiety (STAI-S) scale (range 20 to 80) and -0.71 standardized units (13 studies, 1028 participants; 95 percent CI -0.74 to -0.06, P = 0.02; very low quality evidence). Significant pain-relieving effect (7studies, 528 participants; SMD: -0.91, 95% CI -1.46 to -0.36, P = 0.001, low quality evidence) Music interventions reduced fatigue in a small to moderate way (6 studies, 253 participants; SMD: -0.38, 95 percent CI -0.72 to -0.04, P = 0.03; low quality evidence) [3].
4. 4	Jasemi M, Aazami S, Zabihi RE(2016)	Effect of Music Therapy on Anxiety and Depression among Cancer Patients.	60	There was a significant reduction in depression and anxiety among the intervention group (p=0.001). Anxiety, depression, and sex (P = 0.001, r = 0.42) were found to have significant relationships, as was education (P = 0.003, r = 0.37) [8].
5. 5	Bradt J, Potvin N, et al.,(2015)	A mixed methods study on impact of music therapy versus music medicine on psychological outcomes and pain among patients with cancer .	31	According to the quantitative data, both interventions were equally effective in improving target outcomes. MT sessions, on the other hand, were preferred by 77.4 percent of participants. According to the qualitative data, music improves symptom management, embodies hope for survival, and aids in connecting to a pre-illness self [2].

6. 6	AlcAcontara-Silva TR, de Freitas-Junior R,(2018)	Effect of Music Therapy on Fatigue among Patients with Breast or Gynecological Cancer.	164	<p>FACT-F results were significant for the MTG (music therapy group) in terms of Trial Outcome Index ($P = 0.011$), FACT-G ($P = 0.005$), and FACT-F ($P = 0.001$) when compared to the CG (control group).</p> <p>Individual music therapy sessions are effective in reducing cancer-related fatigue and symptoms of depression, as well as improving quality of life for women undergoing radiation therapy for breast or gynaecological cancer [1].</p>
7. 7	Latif AI , Alhidayat NS et al.,(2020)	Effect of music therapy on anxiety among patients with cancer undergoing chemotherapy	60	<p>The three sessions of music therapy significantly reduced the anxiety level of cancer patients undergoing chemotherapy in the intervention group ($p = 0.001$). Meanwhile, there was no significant reduction in anxiety in the control group ($p = 0.139$) [11].</p>
8. 8	O'steen L, Lockney NA et al (2021)	Influence of Music on Anxiety among Patients planned for Radiation Therapy for Cancer.	102	<p>The study included 102 female participants (51 with and 51 without music).</p> <p>Prior to RT, 48 percent of patients using the STAI and 58 percent of patients using the SDT had a high anxiety score. The percent decrease in mean STAI (State-Trait Anxiety Inventory) score with music was 16 percent versus 10% without music ($P = .2197$).</p> <p>The mean SDT (Symptom Distress Thermometer) percent changes with music were a 13% decrease versus a 2% increase without music ($P = 0.3298$) [15].</p>
9. 9	Lopez G, Christie AJ et al (2019)	A preliminary report on effects of music therapy on self-reported symptoms	96	<p>Anxiety (- 2.3 1.5), drowsiness (- 2.1 2.2), depression (- 2.1 1.9), nausea (- 2.0 2.4), fatigue (- 1.9 1.5), pain (- 1.8 1.4), shortness of breath (- 1.4 2.2), appetite (- 1.1 1.7), and all ESAS subscales (all $p = 0.02$) improved statistically and clinically (all $p = 0.02$). Anxiety (92%), depression (91%) and pain (89%) had the highest clinical response rates [14].</p>
10. 10	Talita Uchoa Lima, Ed Carlos Rey Moura et al (2020)	Impact of a Music Intervention on Quality of Life among patients undergoing Chemotherapy	33	<p>In the third Chemotherapy therapy session, the group music had a lower incidence of depression ($P < .001$) and anxiety scores ($P < .001$) and vomiting ($P < .01$). In the Subjective Impression of the Subject questionnaire, all of the group music participants reported positive changes in their lives, as well as less fatigue and stress [17].</p>
11. 11	Tereza Raquel Alcântara-Silva, Ruffo de Freitas-Junior et al (2018)	Music Therapy on Radiotherapy-Induced Fatigue among Patients with Breast or Gynecological Cancer.	164	<p>FACT-F results were significant for the MTG (music therapy group) in terms of Trial Outcome Index ($P = .011$), FACT-G ($P = .005$), and FACT-F ($P = 0.001$) when compared to the CG (control group) [18].</p>

12. 12	Kordovan S, Preissler P et al (2016)	Prospective Study on effects of Music Therapy among terminally Ill cancer patients during specialized inpatient palliative care	41	68 percent of the participants responded that music therapy was “helpful.” Positive associations were found with singing regularly (p = 0.003), living in a partnership (p = 0.017), having children (p = 0.035), psycho-oncologic therapy (p = 0.043), experience with music therapy (p = 0.007), the role of music in life (p = 0.035), playing an instrument (p = 0.021), and living in a partnership (p = 0.017) [9].
13. 13	Burns DS, Perkins SM(2015)	Effect of Music Therapy on Family Perception of More Spiritual Support and Breathing Problems among Cancer Patients Receiving Hospice Care.	10,534	Between patients who received music therapy and those who did not, there were no differences in pain, anxiety, or overall satisfaction with care. Music therapy patients were more likely to report spiritual dialogues (OR = 1.59, P = 0.01), had marginally less problem in breathing (OR = 0.77, P = 0.06), and were marginally more likely to receive appropriate spiritual support (OR = 1.59, P = 0.06). Music therapy was linked to feelings of meaningful spiritual support and less difficulty breathing [5].
14. 14	Gencer D, Diel A et al., (2019)	Prospective survey to evaluate the potential complementary treatment approaches: music interventions among patients with cancer.	486	A total of 187 patients expressed an interest in complementary music interventions. In the univariate and multivariate analyses, patients with non-somatic complaints and patients actively playing or making music showed significantly higher interest in complementary music interventions, presumably in the hope of a relaxing therapeutic effect. Instrumentalists would prefer more active forms of music interventions [6].
15. 15	Li XM Yan H, Zhou KN,(2011)	Effects of music therapy on pain among patients subjected to radical mastectomy.	120	Music therapy was found to significantly(p<0.05) lower the (Pain Rating Index) PRI-total score in the intervention group compared to the control group, with a mean difference (95 percent CI) of -2.38 (-2.80, -1.95), -2.41 (-2.85, -1.96), and -1.87 (-2.33, -1.42) for the first, second, and third post-tests, respectively. The study’s findings provide some evidence that music therapy has both short- and long-term positive effects on pain relief in breast cancer patients after a radical mastectomy. [1],
16. 16	Zhou KN, Li XM (2011)	Effects of music therapy on depression and hospital stay among breast cancer patients with radical mastectomy.	120	After music therapy, the experimental group’s depression scores were lower than the control group’s in all three post-tests, with significant differences (F = 39.13, P 0.001; F = 82.09, P 0.001). The experimental group’s hospital stay after radical mastectomy (13.62 \hat{A} ± 2.04) days) was significantly shorter than the control group (15.53 \hat{A} ± 2.75) days) with significant difference (t = -4.34, P < 0.001). Music therapy has been shown to improve depression in female breast cancer patients, and the length of hospital stay after a radical mastectomy can be reduced [18].

17. 17	Li XM(1), Zhou KN, Yan H, Wang DL, Zhang YP. (2012)	A randomized clinical trial on effects of music therapy on anxiety among breast cancer patients .	120	The repeated-measure ANCOVA model analysis revealed that the experimental group's mean state anxiety score was significantly ($p < 0.05$) lower than the control group's at each of the three post-test measurements. The mean difference between the experimental and control groups, as well as the 95 percent confidence intervals, were calculated as $-4\hat{A}\cdot 57$ ($-6\hat{A}\cdot 33$, $-2\hat{A}\cdot 82$), $-8\hat{A}\cdot 91$ ($-10\hat{A}\cdot 75$, $-7\hat{A}\cdot 08$) and $-9\hat{A}\cdot 69$ ($-11\hat{A}\cdot 52$, $-7\hat{A}\cdot 85$) at the 1st post-test, 2nd post-test and 3rd post-test respectively [12].
18. 18	Hsieh FC, Miao NF(2019)	A feasibility study in Taiwan on effect of home-based music intervention versus ambient music among breast cancer survivors.	60	HBMI significantly reduced symptom severity, pain intensity, overall fatigue, general fatigue, emotional fatigue, and vigour after 6, 12, and 24 weeks. ($p\hat{A} < \hat{A} 0.05$). Additionally, HBMI significantly reduced physical fatigue after 6 ($p\hat{A} = \hat{A} 0.003$) and 12 ($p\hat{A} = \hat{A} 0.013$) weeks and mental fatigue after 6 weeks ($p\hat{A} = \hat{A} 0.001$). After 6, 12, and 24 weeks, HBMI reduced symptom severity, pain intensity, and overall fatigue. Furthermore, HBMI immediately reduced physical and mental fatigue. We recommend that HBMI be given to breast cancer patients in order to reduce their negative thoughts about the disease [7].
19. 19	Lima TU, Moura ECR(2020)	A Randomized Clinical Trial on impact of Music Intervention on Quality of Life among patients with Breast Cancer subjected to Chemotherapy.	33	To compare qualitative variables, the Student's t test and chi-squared test were used. Results revealed that in the first and third CT sessions, the GM had higher QoL scores on functional scales than the GC. In the third CT session, the GM had a lower incidence of depression ($P=0.001$), anxiety ($P=0.001$), and vomiting ($P=0.01$). In the Subjective Impression of the Subject questionnaire, all of the GM participants reported positive changes in their lives, as well as less fatigue and stress [13].
20. 20	Bro ML, Johansen C et al., (2019)	A randomized controlled, multi-center trial on effects of live music during chemotherapy among patients with lymphoma.	143	When age, gender, diagnosis, number of sessions, and baseline anxiety were all controlled for, the linear mixed model revealed a borderline statistically significant reduction in primary outcome anxiety in the live music group compared to standard care. (7% (95% CI, -14% to 0% , $p = 0.05$), while the effect of pre-recorded music was non-significant (5% (95% CI, -12% to $+3\%$, $p = 0.18$). Secondary outcomes revealed no intervention effects. Live music that patients prefer reduces anxiety in patients with malignant lymphomas undergoing chemotherapy [4].

Table 1: Description of the study.

Discussion

This study reviewed systematically the effects of music therapy on variables such as pain, anxiety, depression, exhaustion and quality of life. The overall findings revealed that music therapy has a positive effect in reduction of pain, anxiety, depression and exhaustion in patients with cancer. The Spielberger State Anxiety Inventory-State Anxiety (STAI-S) was used to measure anxiety reduction, while FACT was used to measure quality of life (Functional assessment of chronic illness therapy). Music therapy had minimized the need for anesthetics and analgesics, as well as recovery time and hospitalization duration, according to the findings of a single study, but additional research is needed to support these findings. Many studies did not disclose the information on various domains of quality of life, including physical health, emotional, social and spiritual well-being. However, the study participants of two articles included in this review reported positive changes in terms of reduction of anxiety and depression, which may be associated with better quality of life of patients with cancer.

Strengths

The findings of the present study, strengthens the professional role of nurses as direct care providers and policy makers in caring for cancer patients. It was a comprehensive search strategy across multiple database. The results suggests that music therapy has a positive effect over pain, depression, anxiety and quality of life among cancer patients.

Limitations

The current study has few limitations that must be acknowledged. The relevant databases, a hidden source of bias in this review may involve the failure to include all relevant original trials. Pertinent bias occurs when full text of studies not available. The side effects of music therapy were not studied, furthermore there were no standardized music therapy administered for pain, depression, anxiety and quality of life.

Implications

Oncology and palliative care nurses are uniquely positioned to step into new roles in giving care to cancer patients. The results of this review provides evidence based practice to utilize music interventions to reduce pain, depression and anxiety among patients receiving chemotherapy, radiotherapy and palliative care. The concept of incorporating music therapy must be emphasized in the undergraduate as well as in postgraduate nursing curricula. Cancer care centers must be equipped with facilities for music therapy.

Recommendations

The long-term effects on the characteristics of music therapy

upon the pain, depression, anxiety and quality of life can be studied. The framework of music therapy such as type, frequency, duration and time for each type of cancers can be further researched. The description of cost analysis of the intervention with the outcome of various cancers can be conducted.

Conclusion

This systematic review found that music therapy is an active intervention to reduce anxiety, pain and fatigue, and improves the quality of life in cancer patients. Though it is harmless, cost effective and can be implemented easily, further studies and meta-analyses should be conducted to enhance evidence-based practice.

References

1. Alcntara-Silva TR, de Freitas-Junior R, Freitas NMA, Junior WDP, Da Silva DJ, et al. (2018) Music Therapy Reduces Radiotherapy-Induced Fatigue in Patients with Breast or Gynecological Cancer: A Randomized Trial. *Integr Cancer Ther* 17: 628-635.
2. Bradt J, Potvin N, Kesslick A, Shim M, Radl D, et al. (2014) The impact of music therapy versus music medicine on psychological outcomes and pain in cancer patients: a mixed methods study. *Support Care Cancer* 23: 1261-1271.
3. Bradt J, Dileo C, Magill L, Teague A (2016) Music interventions for improving psychological and physical outcomes in cancer patients. *Cochrane Database Syst Rev* 15: CD006911.
4. Bro ML, Johansen C, Vuust P, Enggaard L, Himmelstrup B, et al. (2019) Effects of live music during chemotherapy in lymphoma patients: a randomized, controlled, multi-center trial. *Support Care Cancer* 27: 3887-3896.
5. Burns DS, Perkins SM, Tong Y, Hilliard RE, Cripe LD (2019) Music Therapy is Associated with Family Perception of More Spiritual Support and Decreased Breathing Problems in Cancer Patients Receiving Hospice Care. *J Pain Symptom Manage* 50: 225-231.
6. Gencer D, Diel A, Klotzbach K, Christians K, Rauch M, et al. (2019) Cancer patients and music: (prospective) results from a survey to evaluate potential complementary treatment approaches. *J Cancer Res Clin Oncol* 145: 2141-2148.
7. Hsieh FC, Miao NF, Tseng IJ, Chiu HL, Kao CC, et al. (2019) Effect of home-based music intervention versus ambient music on breast cancer survivors in the community: A feasibility study in Taiwan. *Eur J Cancer Care (Engl)* 28: e13064.
8. Jasemi M, Aazami S, Zabihi RE (2016) The Effects of Music Therapy on Anxiety and Depression of Cancer Patients. *Indian J Palliat Care* 22: 455-458.
9. Kordovan S, Preissler P, Kamphausen A, Bokemeyer C, Oechsle K (2016) Prospective Study on Music Therapy in Terminally Ill Cancer Patients during Specialized Inpatient Palliative Care. *J Palliat Med* 19:394-399.
10. Krishnaswamy P, Nair S (2016) Effect of Music Therapy on Pain and Anxiety Levels of Cancer Patients: A Pilot Study. *Indian J Palliat Care* 22: 307-311.
11. Latif AI, Alhidayat NS, Putra SH, Erika KA, Ningrat S, et al. (2020)

- Effectiveness of music therapy in reducing the level of anxiety among cancer patients undergoing chemotherapy. *Enferm Clin* 2:304-307.
12. Li XM, Zhou KN, Yan H, Wang DL, Zhang YP (2011) Effects of music therapy on anxiety of patients with breast cancer after radical mastectomy: a randomized clinical trial. *J Adv Nurs* 68:1145-1155.
 13. Lima TU, Moura ECR, Oliveira CMB, Leal RJDC, Neto JN, et al. (2020) Impact of a Music Intervention on Quality of Life in Breast Cancer Patients Undergoing Chemotherapy: A Randomized Clinical Trial. *Integr Cancer Ther* 19:1534735420938430.
 14. Lopez G, Christie AJ, Powers-James C, Bae MS, Dibaj SS, et al. (2019) The effects of inpatient music therapy on self-reported symptoms at an academic cancer center: a preliminary report. *Support Care Cancer* 27:4207-4212.
 15. O'steen L, Lockney NA, Morris CG, Johnson-Mallard V, et al. (2021) A Prospective Randomized Trial of the Influence of Music on Anxiety in Patients Starting Radiation Therapy for Cancer. *Int J Radiat Oncol Biol Phys* 109: 670-674.
 16. Palmer JB, Lane D, Mayo D, Schluchter M, Leeming R (2011) Effects of Music Therapy on Anesthesia Requirements and Anxiety in Women Undergoing Ambulatory Breast Surgery for Cancer Diagnosis and Treatment: A Randomized Controlled Trial. *J Clin Oncol* 33: 3162-3168.
 17. Lima TU, Moura ECR, De Oliveira CMB, Leal RJDC, Neto JN, et al. (2020) Impact of a Music Intervention on Quality of Life in Breast Cancer Patients Undergoing Chemotherapy: A Randomized Clinical Trial. *Integr Cancer Ther* 19:1534735420938430.
 18. Zhou KN, Li XM, Yan H, Dang SN, Wang DI (2011) Effects of music therapy on depression and duration of hospital stay of breast cancer patients after radical mastectomy. *Chin Med J* 124:2321-2327.