International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Effectiveness of Music Therapy in Reducing Pain, Stress, and Anxiety among Patients Undergoing Chemotherapy in a Day Care Unit: A Crossover Design Study

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Abstract

Background

Cancer is a major global health concern, and chemotherapy remains one of the most commonly used treatment modalities for managing various types of cancer. Despite its therapeutic benefits, chemotherapy is often associated with several distressing physical and psychological symptoms, including pain, stress, and anxiety. These symptoms can significantly affect the overall well-being, treatment experience, and quality of life of patients undergoing chemotherapy. Conventional management of these symptoms primarily involves pharmacological approaches, which may not always provide complete relief and can sometimes lead to additional side effects. In recent years, complementary and non-pharmacological interventions such as music therapy have gained increasing attention in oncology care for their potential to improve patient comfort and psychological well-being.

Aim

The aim of the present study was to evaluate the effectiveness of music therapy in reducing pain, stress, and anxiety among patients undergoing chemotherapy in a day care unit.

Method

A quantitative research approach with a one-group pre-test & post-test crossover design was adopted for the study. The research was conducted in the chemotherapy day care unit of Apollo Excelcare Hospital. A purposive sampling technique was used to select 30 patients receiving chemotherapy for more than two hours. Data were collected using standardized assessment tools including the Visual Analog Scale (VAS)

for pain, the Perceived Stress Scale (PSS) for stress, and the Hospital Anxiety and Depression Scale – Anxiety subscale (HADS-A) for anxiety. During the second chemotherapy session, participants were asked to listen to music of their own choice through headphones for a duration of 20–30 minutes. Pre-intervention and post-intervention assessments were conducted to measure changes in pain, stress, and anxiety levels.

Results
The findings of the study demonstrated a significant reduction in the levels of pain, stress, and anxiety among patients following the music therapy intervention. The comparison of pre-test and post-test scores indicated that music therapy had a positive effect on improving the emotional and psychological well-being of chemotherapy patients.

Conclusion
The study concludes that music therapy is an effective, safe, and cost-effective non-pharmacological intervention for reducing pain, stress, and anxiety among patients undergoing chemotherapy. Incorporating music therapy into routine oncology nursing practice may contribute to improved patient comfort and a more holistic approach to cancer care.

Keywords: Music therapy, Chemotherapy, Pain, Stress, Anxiety, Oncology nursing, Complementary therapy.

Introduction

Cancer is one of the leading causes of morbidity and mortality worldwide and continues to pose a significant public health challenge. According to global health statistics, the incidence of cancer has been steadily increasing due to population aging, lifestyle changes, and environmental factors. Advances in early detection and treatment have improved survival rates; however, cancer treatment modalities such as surgery, chemotherapy, and radiotherapy often produce considerable physical and psychological distress for patients.Chemotherapy remains one of the most widely used therapeutic approaches in the management of various types of cancer. It works by destroying rapidly dividing cancer cells or preventing their growth and spread. Despite its effectiveness in controlling disease progression, chemotherapy is frequently associated with several adverse effects that can negatively influence patients' quality of life. Common side effects include nausea, fatigue, hair loss, pain, emotional distress, stress, and anxiety. These symptoms may arise due to both the physiological impact of chemotherapy drugs and the psychological burden associated with the diagnosis and treatment of cancer.

Pain is one of the most common symptoms experienced by patients undergoing chemotherapy. It may result from the disease itself, treatment-related complications, or invasive medical procedures. Persistent pain can significantly impair a patient's physical functioning and emotional well-being. In addition to pain, many patients experience heightened levels of anxiety and stress during chemotherapy sessions. Anxiety may stem from fear of treatment outcomes, uncertainty about disease prognosis, and concerns about side effects. Stress may arise due to prolonged treatment schedules, financial burden, and disruption of daily life activities. Managing these symptoms is an essential component of comprehensive cancer care. Traditionally, pharmacological interventions such as analgesics, sedatives, and anxiolytics are used to manage pain and psychological distress. While these medications can provide relief, they may not always

fully address the emotional and psychological needs of patients and may also produce undesirable side effects. As a result, healthcare professionals have increasingly explored complementary and non-pharmacological interventions that can support conventional treatment and improve patient well-being.

Music therapy is one such complementary intervention that has gained increasing recognition in healthcare settings. Music therapy involves the therapeutic use of music to address physical, emotional, cognitive, and social needs of individuals. Listening to music can promote relaxation, reduce emotional distress, and provide distraction from unpleasant experiences. Music has been shown to influence the autonomic nervous system, resulting in reduced heart rate, blood pressure, and stress hormone levels. These physiological responses may contribute to decreased perception of pain and anxiety.

In the context of oncology care, music therapy has been used as a supportive intervention during medical procedures, chemotherapy sessions, and palliative care. Several studies have reported that music therapy can reduce pain perception, alleviate anxiety, and improve mood among cancer patients. Music can serve as a distraction technique that shifts the patient's attention away from discomfort and helps create a calming environment during treatment. Furthermore, allowing patients to choose music according to their personal preferences may enhance the effectiveness of the intervention by promoting a sense of control and emotional connection.

Diversional therapy, which includes activities such as music listening, reading, drawing, and relaxation exercises, is often used to improve patient comfort and reduce psychological distress in clinical settings. Among these approaches, music therapy is considered particularly beneficial because it is easy to implement, inexpensive, non-invasive, and free from adverse effects. It can also be easily integrated into routine nursing care without requiring extensive training or specialized equipment.

Despite the growing interest in music therapy as a supportive care intervention, there is still limited evidence regarding its effectiveness among patients undergoing chemotherapy in day care units, particularly in hospital settings where patients receive treatment for extended periods. Chemotherapy sessions often last several hours, during which patients may experience discomfort, boredom, and emotional distress. Implementing simple interventions such as music therapy during these sessions may help improve the treatment experience and enhance patient satisfaction.

Incorporating non-pharmacological interventions into oncology nursing practice aligns with the principles of holistic care, which emphasize addressing not only the physical symptoms of illness but also the emotional and psychological needs of patients. Oncology nurses play a crucial role in providing supportive care and identifying strategies that can improve patient comfort and well-being during treatment.

Therefore, the present study was undertaken to evaluate the effectiveness of music therapy in reducing pain, stress, and anxiety among patients undergoing chemotherapy in a day care unit. The findings of this study may provide valuable insights into the potential benefits of integrating music therapy into routine oncology care and may contribute to improving the overall treatment experience for cancer patients.

Objectives of the Study

1. To assess the level of pain, stress, and anxiety among chemotherapy patients before the music therapy intervention.
2. To assess the level of pain, stress, and anxiety after the music therapy intervention.
3. To evaluate the effectiveness of music therapy in reducing pain, stress, and anxiety among chemotherapy patients.
4. To provide recommendations for incorporating music therapy into routine oncology care.

Hypotheses

H0: There is no significant difference in perceived pain, stress, and anxiety levels before and after music therapy among chemotherapy patients.

H1: There is a significant difference in perceived pain, stress, and anxiety levels before and after music therapy among chemotherapy patients.

Review of Literature

A review of literature provides an overview of previous research related to the topic and helps identify gaps that justify the need for the present study. The literature related to the effectiveness of music therapy in reducing pain, stress, and anxiety among cancer patients undergoing chemotherapy has been reviewed and organized under the following sections:

1. Studies related to pain among patients undergoing chemotherapy
2. Studies related to stress and anxiety among cancer patients
3. Studies related to the effectiveness of music therapy in oncology care
4. Studies related to diversion and complementary therapies in cancer care

Studies Related to Pain among Patients Undergoing Chemotherapy

Pain is a common and distressing symptom experienced by patients undergoing chemotherapy. Treatment-related procedures, drug toxicity, and disease progression may contribute to physical discomfort. Effective management of pain is therefore essential to improve the quality of life of cancer patients.

Rennie et al. (2022) conducted a systematic review examining the role of music therapy as a non-pharmacological intervention for pain management in cancer patients. The study analyzed multiple clinical trials and reported that music therapy significantly reduced pain perception among patients receiving cancer treatment. The authors concluded that music therapy can serve as a safe and supportive intervention alongside pharmacological pain management.

A study conducted by Lee et al. (2021) investigated the effectiveness of music-based interventions in reducing pain among patients undergoing cancer treatment. The results showed that patients who listened to music during treatment sessions reported significantly lower pain scores compared with those who received routine care.

Similarly, a study by Wang et al. (2020) examined the effect of music therapy on pain among cancer patients receiving chemotherapy. The findings indicated that music therapy helped decrease pain intensity and improved patient comfort during chemotherapy sessions.

These studies demonstrate that music therapy can be an effective complementary approach to pain management among cancer patients undergoing chemotherapy.

Studies Related to Stress and Anxiety among Cancer Patients

Patients undergoing chemotherapy often experience increased levels of psychological distress, including anxiety and stress. These emotional responses may arise from fear of treatment outcomes, uncertainty regarding prognosis, and the physical burden of chemotherapy.

A study conducted by Rossetti et al. (2021) evaluated the effect of music therapy on anxiety levels among cancer patients undergoing medical treatment. The findings showed that patients who listened to music

during treatment reported significantly reduced anxiety levels compared with those who did not receive music therapy.

Another study conducted by Chuang et al. (2022) examined the impact of music therapy on psychological well-being among cancer patients. The results demonstrated that music therapy significantly reduced anxiety and stress levels while improving emotional comfort during treatment.

Similarly, a study by Li et al. (2023) investigated the effect of music interventions on stress reduction among oncology patients. The study reported that music therapy significantly reduced stress levels and improved patients' emotional responses during treatment sessions.

Studies Related to the Effectiveness of Music Therapy in Oncology Care

These studies highlight the potential of music therapy as an effective intervention to alleviate psychological distress among patients undergoing cancer treatment.

Music therapy has increasingly been recognized as a beneficial supportive care intervention in oncology settings. It promotes relaxation, emotional expression, and psychological comfort for patients undergoing cancer treatment.

A systematic review conducted by Bradt et al. (2021) examined the effectiveness of music therapy interventions among cancer patients. The review concluded that music therapy significantly improved mood, reduced anxiety, and enhanced overall quality of life among patients receiving cancer treatment.

Another study conducted by Zhao et al. (2022) evaluated the role of music therapy in improving emotional well-being among cancer patients. The study found that music therapy helped reduce psychological distress and improved patient satisfaction with treatment.

Furthermore, a study by Park et al. (2024) investigated the use of music therapy during chemotherapy sessions. The results showed that patients who received music therapy experienced improved relaxation, reduced anxiety levels, and better overall treatment experience.

These findings indicate that music therapy is an effective and practical supportive intervention in oncology care.

Studies Related to Diversion and Complementary Therapies in Cancer Care

Diversion therapy refers to interventions designed to distract patients from pain and psychological distress. These interventions include music therapy, relaxation techniques, mindfulness, guided imagery, and art therapy.

A study conducted by Azeez-Apata and Asuzu (2025) examined the effectiveness of mindfulness-based stress reduction and diversion therapy among cervical cancer patients. The study demonstrated that these interventions significantly reduced psychological distress and improved coping ability among patients.

Another study conducted by Kim et al. (2023) evaluated the effectiveness of complementary therapies, including music therapy and relaxation techniques, among cancer patients undergoing treatment. The findings indicated that these interventions significantly improved emotional well-being and reduced stress levels.

Similarly, a study by Johnson et al. (2021) explored the role of complementary therapies in improving the quality of life of cancer patients. The study concluded that interventions such as music therapy and relaxation therapy contributed to reduced anxiety, improved emotional stability, and enhanced patient satisfaction with care.

These studies highlight the importance of complementary therapies in improving the psychological and emotional health of cancer patients.

Operational Definitions

Operational definitions clarify the meaning of key terms used in the study.

Music Therapy: In this study, music therapy refers to the intervention in which patients undergoing chemotherapy listen to music of their own choice through headphones for approximately 20–30 minutes during the chemotherapy session**.**

Pain:

Pain refers to the subjective physical discomfort experienced by patients undergoing chemotherapy, measured using the Visual Analog Scale (VAS)**.**

Stress:

Stress refers to the psychological strain or tension experienced by patients during chemotherapy treatment, measured using the Perceived Stress Scale (PSS)**.**

Anxiety:

Anxiety refers to the feelings of worry, nervousness, or uneasiness experienced by patients undergoing chemotherapy, measured using the Hospital Anxiety and Depression Scale – Anxiety subscale (HADS-A)**.**

Chemotherapy Patients:

Chemotherapy patients refer to individuals receiving chemotherapy treatment for cancer in the day care unit of the selected hospital.

Methodology

Research Approach

The study adopted a quantitative research approach to evaluate the effectiveness of music therapy in reducing pain, stress, and anxiety among chemotherapy patients.

Research Design

A one-group pre-test & post-test crossover pre-experimental research design was used for the study.

Setting of the Study

The study was conducted in the chemotherapy day care unit of Apollo Excelcare Hospital.

Duration of the Study

The study was carried out over a period of three months**.**

Population and Sample

Target Population

The target population consisted of patients receiving chemotherapy treatment in the day care unit.

Sample Size

The sample consisted of 30 patients undergoing chemotherapy**.**

Sampling Technique

A purposive sampling technique was used to select participants who met the inclusion criteria.

Inclusion Criteria

- Patients receiving chemotherapy for more than two hours
- Patients aged above 18 years
- Patients who are conscious and able to hear

- Patients willing to participate and provide informed consent

Exclusion Criteria

- Critically ill patients
- Patients with hearing impairment

Data Collection Tools

Three standardized tools were used to collect data:

1. Visual Analog Scale (VAS) – to measure perceived pain level
2. Perceived Stress Scale (PSS) – to assess stress level
3. Hospital Anxiety and Depression Scale – Anxiety subscale (HADS-A) – to measure anxiety level

Data Collection Procedure

Before initiating the study, formal permission was obtained from the hospital authorities. Participants were informed about the purpose of the study, and written informed consent was obtained. During the first chemotherapy session**,** pain, stress, and anxiety levels were assessed before and after chemotherapy without music therapy. During the second chemotherapy session, participants were asked to listen to music of their own choice through headphones for 20–30 minutes**.** Pre-intervention and post-intervention assessments were then conducted using the same measurement tools.

Plan for Data Analysis

The collected data were analysed using descriptive and inferential statistics.

Descriptive statistics

- Frequency
- Percentage
- Mean
- Standard deviation

Inferential statistics

- Paired t-test to determine the effectiveness of music therapy.

Results

This section presents the findings of the study conducted to evaluate the effectiveness of music therapy in reducing pain, stress, and anxiety among patients undergoing chemotherapy.

The collected data were analysed using descriptive and inferential statistics. The results are presented under the following headings:

1. Distribution of participants according to demographic variables
2. Comparison of pain scores before and after music therapy
3. Comparison of stress scores before and after music therapy
4. Comparison of anxiety scores before and after music therapy

Distribution of Participants According to Demographic Variables

Table 1
Distribution of participants according to age (n = 30)

Age Group	Frequency	Percentage
18–30 years	6	20%
31–45 years	10	33.3%
46–60 years	9	30%
Above 60 years	5	16.7%
Total	30	100%

The above table shows that the majority of participants (33.3%) were in the age group of 31–45 years**.**

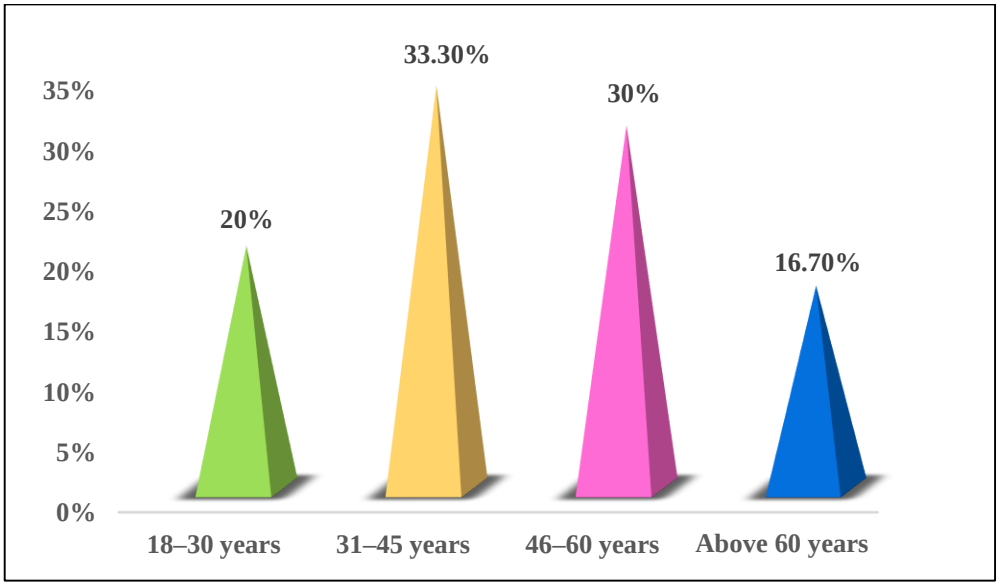
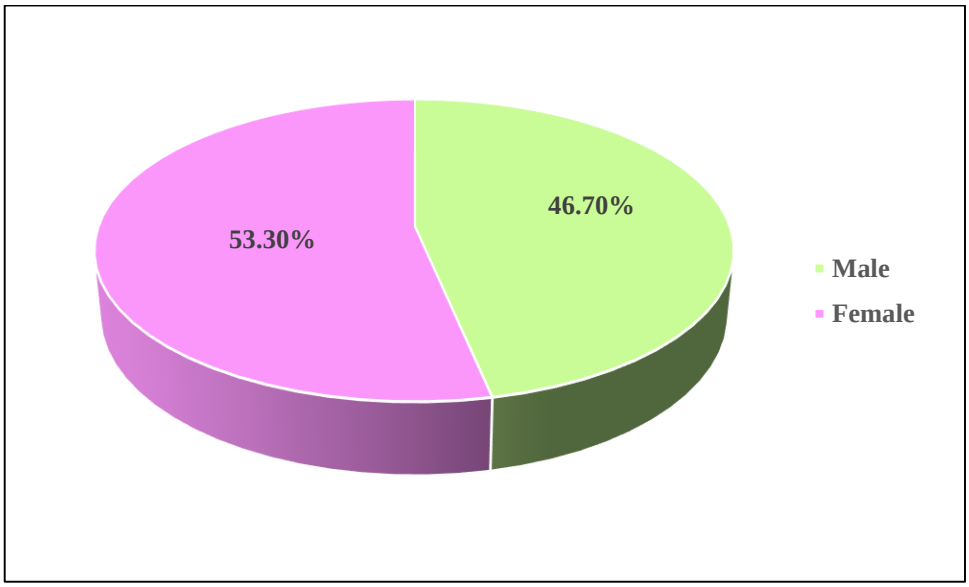


Table 2

Distribution of participants according to gender (n = 30)

Gender	Frequency	Percentage
Male	14	46.7%
Female	16	53.3%
Total	30	100%

The table shows that 53.3% of the participants were female and 46.7% were male**.**



Comparison of Pain Scores Before and After Music Therapy

Table 3
Mean and standard deviation of pain scores before and after music therapy (n = 30)

Variable	Mean	Standard Deviation
Pre-test pain score	6.40	1.25
Post-test pain score	3.20	1.10

The mean pre-test pain score was 6.40**,** whereas the mean post-test pain score decreased to 3.20**,** indicating a reduction in pain following music therapy.

Table 4
Paired t-test showing effectiveness of music therapy on pain

Variable	Mean Difference	t value	p value	Significance
Pain score	3.20	8.21	<0.001	Significant

The paired t-test results indicate a statistically significant reduction in pain levels after music therapy.

Comparison of Stress Scores Before and After Music Therapy

Table 5
Mean and standard deviation of stress scores before and after music therapy (n = 30)

Variable	Mean	Standard Deviation
Pre-test stress score	21.50	3.10
Post-test stress score	15.30	2.80

The mean stress score decreased from 21.50 before intervention to 15.30 after music therapy, indicating reduced stress levels.

Table 6
Paired t-test showing effectiveness of music therapy on stress

Variable	Mean Difference	t value	p value	Significance
Stress score	6.20	7.45	<0.001	Significant

The results indicate a significant reduction in stress levels among patients after music therapy**.**

Comparison of Anxiety Scores Before and After Music Therapy

Table 7
Mean and standard deviation of anxiety scores before and after music therapy (n = 30)

Variable	Mean	Standard Deviation
Pre-test anxiety score	12.40	2.60
Post-test anxiety score	7.20	2.10

The mean anxiety score decreased from 12.40 before intervention to 7.20 after music therapy**,** indicating improved emotional well-being among patients.

Table 8

Paired t-test showing effectiveness of music therapy on anxiety

Variable	Mean Difference	t value	p value	Significance
Anxiety score	5.20	6.89	<0.001	Significant

The findings demonstrate that music therapy significantly reduced anxiety levels among chemotherapy patients**.**

Overall Interpretation of Results

The results of the study indicate that music therapy had a significant effect in reducing pain, stress, and anxiety among patients undergoing chemotherapy. The comparison between pre-test and post-test scores demonstrated a statistically significant improvement in patient outcomes following the intervention. Therefore, the alternative hypothesis (H1) was accepted, indicating that music therapy is an effective intervention for improving the psychological and physical well-being of chemotherapy patients.

Discussion

The present study was conducted to evaluate the effectiveness of music therapy in reducing pain, stress, and anxiety among patients undergoing chemotherapy in a day care unit. The findings of the study demonstrated that music therapy significantly reduced pain, stress, and anxiety levels among the participants. In the present study, the mean pain score decreased from 6.40 in the pre-test to 3.20 in the post-test**,** indicating a significant reduction in pain after the music therapy intervention. Music therapy may help reduce pain perception by diverting patients' attention away from discomfort and promoting relaxation. These findings are consistent with the study conducted by Rennie et al. (2022)**,** which reported that music therapy significantly improved pain management among cancer patients. The study suggested that music therapy can act as a complementary intervention alongside pharmacological pain management. The present study also found a significant reduction in stress levels after the music therapy intervention. The mean stress score decreased from 21.50 before intervention to 15.30 after intervention. Listening to music can promote relaxation by reducing physiological stress responses such as increased heart rate and cortisol levels. These findings are supported by Chuang et al. (2022)**,** who reported that music therapy significantly reduced psychological stress and improved emotional well-being among cancer patients undergoing treatment. Similarly, the results of the study showed a significant reduction in anxiety levels among participants after the intervention. The mean anxiety score decreased from 12.40 in the pre-test to 7.20 in the post-test**.** Music therapy may reduce anxiety by creating a calming environment and helping patients cope with treatment-related fears. These findings are in agreement with Rossetti et al. (2021**)**, who found that music therapy significantly reduced anxiety levels among cancer patients receiving medical treatment. Overall, the findings of the present study support the growing body of evidence indicating that music therapy is an effective complementary intervention for improving the psychological and emotional well-being of cancer patients. The results suggest that incorporating music therapy during chemotherapy sessions may enhance patient comfort and contribute to a more positive treatment experience.

Implications for Nursing Practice

The findings of the present study have several implications for nursing practice. Music therapy can be incorporated as **a** simple and cost-effective supportive intervention in chemotherapy units to reduce patient discomfort and psychological distress. Oncology nurses play a key role in implementing complementary therapies that enhance patient comfort and promote holistic care. The integration of music therapy into routine clinical practice may help improve patient satisfaction and overall treatment experience. Nurses can encourage patients to listen to music during chemotherapy sessions to reduce stress and anxiety. In addition, healthcare institutions can develop protocols for implementing music therapy as part of supportive cancer care programs. Training nurses to utilize complementary therapies may further enhance the quality of patient-centered care.

Limitations of the Study

The present study has certain limitations that should be considered while interpreting the findings. The study was conducted with a relatively small sample size of 30 participants, which may limit the generalizability of the results. The study was also conducted in a single hospital setting, which may not represent the experiences of patients in other healthcare institutions. Additionally, the study used a pre-experimental research design without a control group, which may limit the ability to establish causal relationships. Patient responses to music therapy may also vary depending on individual preferences and emotional states.

Recommendations

Based on the findings of the study, the following recommendations are proposed:

1. Similar studies can be conducted with larger sample sizes to improve the generalizability of the findings.
2. Future research may use randomized controlled trial designs to further evaluate the effectiveness of music therapy.
3. Studies can also examine the long-term effects of music therapy on quality of life among cancer patients**.**
4. Additional research may explore the effectiveness of other complementary therapies such as relaxation techniques, guided imagery, or meditation in oncology settings.
5. Healthcare institutions should consider integrating music therapy as part of supportive care programs for cancer patients.

Conclusion

The present study demonstrated that music therapy is an effective complementary intervention for reducing pain, stress, and anxiety among patients undergoing chemotherapy. The findings suggest that listening to music during chemotherapy sessions can significantly improve patient comfort and emotional well-being. Music therapy is a simple, non-invasive, and cost-effective intervention that can be easily implemented in clinical settings without requiring specialized equipment or extensive training. Incorporating music therapy into routine oncology care may contribute to a more holistic approach to patient management and improve the overall treatment experience for cancer patients.

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