



## Significance of music therapy in treating depression and anxiety disorders among people with cancer

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### Abstract

Globally, cancer cases and mortality have recently escalated and have attracted global concern. The clinical diagnosis and manifestation of cancer can result in significant mental health issues like depression and anxiety disorders. The tendency of people with cancer to suffer from psychological disorders such as anxiety and depression is usually high. A significant number of deaths related to cancer may likely not be from the killer disease but from psychological disorders associated with the illness. The utilization of music as a remedial approach to healing mental disorders cannot be overstated. Thus, identifying the impacts of music therapy in dealing with depression and anxiety disorders among people with cancer is relevant, as the majority of methods used in treating cancer have some side effects which may trigger psychological disorders in cancer patients. Ultimately, this study explored the significance of music therapy in treating depression and anxiety disorders among people with cancer. To achieve the aim of this study, the authors employed a narrative literature review to investigate the significance of music therapy in addressing depression and anxiety disorders among people with cancer. The type of literature review employed in this study is to provide an understanding of the selected research papers. The review found that music therapy significantly reduces depression and anxiety disorders among breast cancer, lung cancer, prostate cancer, and colorectal cancer patients. It is needful for healthcare providers to incorporate music therapy interventions while treating people with cancer. This will help reduce cancer deaths resulting from psychological disorders rather than the killer disease, cancer. However, the standardized procedures and evaluation criteria for applying music-based intervention strategies in oncology medicine still need to be further established and improved.

**Key Words:** Anxiety disorders; Breast cancer; Cancer; Cancer patients; Colorectal cancer;

Depression; Lung cancer; Music therapy; Prostate cancer

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**Core Tip:** People diagnosed with cancer and receiving treatment experience anxiety and depression, which may influence their healing process. Most cancer patients may die from depression, anxiety, and other psychological disorders. The mental health of cancer patients is important as their physical health. Therefore, addressing the psychological needs of people with cancer is necessary to improve their health status. In this review, we demonstrate music therapy as a significant treatment approach for reducing depression and anxiety disorders among patients with breast cancer, lung cancer, prostate cancer, and colorectal cancer.

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## INTRODUCTION

A health condition known as cancer occurs when a small percentage of the cells in the body develop abnormally and disseminate to other bodily regions. Cancer can develop from any body part that accommodates trillions of cells[1]. The dissemination of cancerous cells to other parts of the body system is known as metastasizing, which mainly results in death from cancer. Whereas the 21st century has witnessed an improved performance of public nutrition, social behavior, and personal hygiene, as well as the methods adopted in preventing, controlling, and treating infectious diseases, which have all contributed to the current rise in the average lifespan of people, there is still an upsurge of cancer-related cases and deaths[2]. Globally, cancer has had a remarkable impact on the physical and psychological well-being and finances of individuals, family relations, communities, and the healthcare sector. Most of the healthcare system in resource-limited areas is poorly equipped. Thus, many cancer patients in these locations lack access to prompt, effective detection and subsequent medical therapy. The availability of early detection, effective therapy, and post-treatment care in nations with robust health systems have improved the survival rates of many different malignancies[3,4]. However, cancer prevalence and its common occurrence in emerging economies have continued to vary globally. Thus, in 1975, limited-resource areas accounted for over half (51%) of all cancer cases globally. By 2007, this number had risen to 55%, it has been predicted to rise to 61% by 2050[5,6]. Lung, breast, colorectal, and prostate cancers primarily associated with advanced economics have become a global concern. Diagnosing cancer induces mental stress, which may result in depression, fear, and anxiety[7,8].

Approximately 50% to 85% of cancer patients experiencing late-stage treatment report anxiety and depression[7]. Depression and anxiety negatively influence all aspects of cancer malignancy and its development, the efficacy of given therapy, and the patient's quality of life[9]. The practice of using music to aid recovery and improve the quality of life by medical and music experts is known as music therapy. Music therapy can have several advantages when used in conjunction with traditional cancer treatment[10]. Music therapy is referred to as the most widely used supportive and creative method of treating psychosocial-related impacts of cancer disease[11]. Music therapy is further defined as a systematic method of using music as a therapeutic means of rejuvenating, maintaining, and improving individuals' psychological and physical well-being[12]. Music therapy aims to reduce or eliminate psychological discomfort and improve the health status of individuals suffering from cancer-related health issues. Studies on people living with chronic cancer cases and those in palliative care have revealed that music therapy has drawn massive attention in research and medical treatment[13,14].

Further, the utilization of music as a remedial approach to healing mental disorders dates back to the olden days. Music is referred to as a healer as it aids in the reduction of anxiety and improves relaxation in patients suffering from chronic illness[15]. In the same vein, the realization of music as a contemporary psychotherapeutic approach in medical practice started after the second world war in the 20th century, which witnessed the introduction of courses and training sections and the establishment of national bodies around the globe[16]. The primary objective of this study is to examine depression and anxiety disorders' reports in cancer patients, give a narrative review of related studies and assess the significance of music interventions or music therapy in addressing depression and anxiety disorders among people suffering from the most common types of cancer diseases such as cancer of the breast, lung, prostate, and colorectal cancer[17]. In other words, the study focuses on the need to address the mental health of cancer patients using music therapy. Furthermore, the study aimed to enhance

awareness among medical practitioners providing oncological support and care regarding the significance of music therapy in treating the psychiatric conditions that may emanate from cancer diagnosis.

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## METHODOLOGY

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This study employed a narrative literature review of studies to ascertain the significance of music therapy in treating depression and anxiety disorders among people with cancer. Since the study is a narrative literature review, ethical approval and informed consent are not required. Through a literature search on electronic databases, the authors could access published reviews and research articles, which were analysed using narrative syntheses. A narrative literature review provides informative educational materials as it draws ideas from a variety of papers and transforms these ideas into a readable resource. Thus, a narrative review provides a broader perspective on the topic of discussion. The authors conducted an extensive literature search and were able to find papers on depression and anxiety disorders in relation to people with various cancer malignancies, music therapy in caring for patients with cancer, and the effects of music therapy in treating depression and other psychosocial disorders from varieties of electronic databases such as Google Scholar, Lens, DOAJ, Scilit, Reference Citation Analysis, Dimensions, Scopus, PubMed Central, and SciELO. Also, searches through the references of the articles retrieved for the study were conducted to access more resources, peer-reviewed papers, and authoritative texts. The literature search terms were limited to depression and anxiety disorders, music therapy, people with cancer or cancer patients, music intervention, colorectal cancer, breast cancer, lung cancer, prostate cancer, psychological disorders, and cancer treatment. This study included relevant qualitative and quantitative research and review papers published in English.

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## DISCUSSION

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### ***Depression and anxiety disorders among people with cancer***

Recently, cancer has been considered the primary cause of death, resulting in about a 10 million mortality rate in 2020, accounting for 1 in 6 deaths globally. The most prevalent cancer affecting the human race include breast cancer which accounts for 2.26 million cancer manifestations. This is followed by lung cancer with about 2.21 million recorded victims, colon and rectum with 1.93 million, and prostate with about 1.20 million cases. Lung cancer led to about 1.80 million deaths, while colorectal and breast cancer accounted for 916000 and 685000, respectively, in 2020[5]. Hence, the mortality rate from chronic diseases such as cancer has recently increased. The most significant psychological disorders affecting people with this chronic disease are depression and anxiety disorders. Depression is characterized by sadness, emptiness, or irritating moods, along with mental and physical abnormalities that negatively impact an individual's functioning, which may be attributed to environmental factors [18]. Anxiety disorder is an emotional state associated with excessive fear of uncertainty, lack of concentration, insomnia, and restlessness[19]. Globally, about 154 million people are affected by this disorder, and it is ranked as the most common cause of the severe impact of the disease. Depression is predicted to surpass all other causes by 2030[20]. According to estimates, the likelihood of early death will be higher for 40% to 60% of those with this condition than for the general population[21]. According to a research finding, about 75% of cancer patients are reported to develop depression and anxiety disorders. At the same time, 50% and 85% of cancer patients suffer acute depression and anxiety simultaneously[7, 22]. Depression and anxiety disorders are common psychiatric conditions that are often disregarded. These neglected psychiatric conditions are some of the impacts of cancer that affect the physical and mental well-being, adherence to therapy, the rate of surviving cancer, and cost of care among people with cancer[23].

Depression and anxiety disorders resulting from an individual being diagnosed with cancer at the initial stage is further exacerbated during therapeutic cancer management, which may have an unfavourable impact on the cancer patient. Studies revealed that a significant number of people living with cancer and receiving treatment have suffered from psychological distress, such as depression and anxiety disorders; between 15% and 54% of cancer patients experience these psychological conditions [24-27]. There are perhaps some variables that may be attributed to having caused depression and anxiety among cancer patients. Some of the variables that may lead to depression and anxiety at the individual level include demographic variables like age, sex, location, gender, and religion. Also, social and economic barriers like the inability to secure paid employment, low-level educational attainment, and inadequate social support are contributing factors[27]. The interaction between two or more of these factors often results in some mental health conditions among people with cancer[26].

Cancer management has a significant financial burden on patients. Thus, a psychological disorder affecting people with cancer can be linked to structural-level indicators such as availability, access, and utilization of healthcare services for the treatment of cancer, as well as the provision of welfare packages

for people with cancer[28,29]. This is because of the potential financial consequences of cancer. Psychological factors such as distinctiveness of the severe mental illness have been identified as one of the variables. Studies have also revealed that people with a high tendency to mental illness occurrence and subsequently diagnosed with cancer constitute the more significant percentage of cancer deaths. This can also be due to the severity of the cancer disease, late clinical diagnosis, poor therapeutic procedures, and a substantial decline in good healthcare-seeking behavior[30,31]. Also, people with cancer tend to suffer from depression and anxiety disorders due to factors such as a lack of adequate coping skills and neuroticism[32]. Another risk associated with cancer patients is suicide. People with cancer have a high probability of committing suicide when compared to the general population. Individuals who had suicidal thoughts in the past are more vulnerable, especially in the first six months of being diagnosed with such malignancy[33,34]. Another factor worthy of mention is how people with cancer deal with a cancer diagnosis using psychological coping strategies. An individual diagnosed with cancer may be susceptible to grief which could, in turn, affect how well the individual accepts their condition, especially if the diagnosis was delayed and the cancer cells have developed to a large extent[35].

However, despair, helplessness, and uncertainty about survival and death may also have detrimental effects on the mental health of people diagnosed with cancer. In addition, the distress associated with receiving a positive cancer diagnosis can interfere with sleep, which reduces the ability to concentrate, thereby increasing the risk of depression and anxiety[36]. People living with cancer may suffer from feelings of guilt and shame which often results from the stigma associated with being mentally ill and having some cancers, such as lung cancer. Depression and anxiety may be triggered by this event[35]. For example, women who develop cervical cancer due to promiscuity may blame themselves for their health condition and tend to feel isolated if they remember the activity that led to the manifestation of cervical cancer.

Additionally, during cancer management, the development of depression and anxiety disorders can also be attributed to the following variables-type of cancer an individual is diagnosed with, the stage of cancer, and the future outcome of the malignancy. The inability to recognize depression and anxiety among individuals with cancer can also potentially impair their quality of life. The treatment of cancers using chemotherapy, corticosteroids, and immunotherapy can also cause depression and anxiety among people with cancers as it involves biochemical procedures which result in inflammatory cytokines. Further, most of the medication used during chemotherapeutic procedures causes nausea, affecting dopamine receptors' neurotransmitter process. This action gives rise to depressive feelings among people with cancer[37]. Research has demonstrated that steroid treatment and androgen deprivation therapy is associated with depression and an increased risk of anxiety disorders in patients with cancer [38,39]. Among people with prostate cancer, depression may also be exacerbated by the clinical manifestations of some malignancies, such as leakage and erectile problems linked to prostate cancer [40]. Research on the psychological condition of people with cancer and the stages or survival rate has recently become a significant and expanding clinical research focus. Research has shown that many variables, including the kind and stage of the cancer malignancy, contribute to the declining mental health of people with cancer. In comparison with the general population, cancer patients are more likely to suffer from anxiety and depression[26].

### ***Treatment of depression and anxiety disorders among people with cancer using music therapy***

Music has psychological and physiological impacts and, as such, provides support in improving the mental and physical health of people with depression and anxiety disorders[21]. Musical stimuli are associated with the large production of endorphins and hormones secreted in the brain and nervous system. This hormone has many psychological functions. It activates enthusiasm, vital energy, excitement, and confidence in individuals. Therefore, the endorphins produced during musical display aid in lessening pain perception, stress, depression, and anxiety and increasing well-being[41]. Furthermore, music therapy (MT) is a significant contributor to the psychological well-being of cancer patients at all stages of their treatment[12].

Music therapy research indicates that people with cancer have benefitted from music expression and experience[42]. Music therapy is a simple, affordable, effective, and convenient method of treating depression and anxiety disorders[22,43]. As such, music therapy is highly recommended to be incorporated into healthcare services for people with cancer. The use of music therapy among cancer patients is helpful and supportive in ameliorating the depressive symptoms and anxiety exhibited by people with cancer[44].

Depression and anxiety disorders are often linked to non-compliance with proper treatment and poor cancer survival and health outcome among people with cancer. It is pertinent to note that cancer patients have an elevated risk of committing suicide[45,46]. Thus, adequate attention is required to address the resulting psychological disorders among cancer patients. Treating depression and anxiety disorders using music therapy involves qualified music therapists employing music as a supplementary or holistic therapeutic solution to help cancer patients cope with their sickness and reduce symptoms related to their condition or treatment procedures[47]. There is growing evidence that supports the use of MT in cancer patients. According to studies, music therapy aids in reducing anxiety levels in cancer patients undergoing major surgery[48,49]. Also, MT reduces depression, as revealed by studies[22,50]. Thus, cancer patients who undergo music therapy have been shown to benefit from its treatment of



depression and anxiety disorders.

The result of a meta-analysis on the effectiveness of music therapy for addressing psychological disorders among cancer patients shows that, compared to other conventional treatments, music therapy is more efficient in addressing depression and anxiety disorders[51]. The study found that music therapy can significantly improve the mental health of patients suffering from depression and anxiety disorders. Cancer patients are recommended to receive music therapy sessions for 1-2 mo to improve their quality of life[51]. Chen *et al*[52] stated that cancer treatment using music therapy reduces depressed mood, neuroticism, despair, and hopelessness. The therapeutic use of music therapy in managing depression and anxiety disorders and treatments carried out in surgery departments, and medical oncology should be encouraged among healthcare professionals[53]. Literature indicate that in addition to music interventions, it is also crucial for patients to receive social support, exercise, and relaxation interventions to minimize the mental health problems associated with a cancer diagnosis and the financial and emotional consequences of the disease[54-69].

### **Significance of music therapy in managing depression and anxiety disorders in people with various kinds of cancer**

This section is dedicated to reviewing papers that examined the significant results of applying music therapy in treating mental health issue in patients with breast cancer, lung cancer, prostate cancer, and colorectal cancer (see also [Table 1](#)).

#### **Breast cancer**

Women are more likely to develop breast cancer than any other cancer malignancy. There are approximately 685000 cancer deaths in women worldwide caused by this type of cancer[54], resulting in the largest share of all cancer deaths in women[3,54]. Globally, about 2261419 new breast cancer occurrences were recorded in 2020, constituting 12.5% of all cancer recorded in 2020[55]. Despite the medical advancement in cancer treatment and prevention, which has resulted in an increased survival rate, breast cancer has a long-term negative mental and physical impacts[56]. Breast cancer patients often express a worse quality of life, experience cancer-related tiredness, and struggle to manage their condition and therapeutic tasks[57-59].

Women diagnosed with breast cancer may experience severe psychological and physical trauma, including altered body views, sleeplessness, exhaustion, discomfort, sadness, and other distressful feelings[60]. Depression and anxiety disorders are regarded to be most prevalent at the acute stage of cancer therapy[61]. The decision of people with cancer to receive cancer treatment may be influenced by depressive symptoms, including feelings of helplessness. It is estimated that approximately half (50%) of all breast cancer patients suffer from depression or anxiety. There is a possibility of experiencing severe depression during conventional chemotherapy, particularly with taxane-based chemotherapies. This condition may last for as long as 18 mo following the conclusion of the chemotherapy treatment[62,63].

Improving the depression and anxiety conditions of women diagnosed with breast cancer involves many interventions ranging from muscle relaxation training, music therapy, exercise, and laughter therapy[64-67]. Research has shown that they might also have unforeseen consequences and adverse implications that could affect breast cancer patients' mental health conditions[68]. Also, the chemotherapeutic session has been reported to be stressful and may negatively impact the mental state of breast cancer patients. Integrating music therapy and emotional expression could help reduce the negative psychological consequences of the treatment[69]. Music therapy is a distraction tool aimed at managing emotions and diverting an individual's attention from an unpleasant condition to a more pleasant and happy moment thereby reducing the risk of mental stress associated with an unpleasant or life-threatening health condition like breast cancer. This distraction method involves the breast cancer patient listening to music regulated by the music therapist[70,71].

Additionally, adopting music therapy in the treatment of depression and anxiety disorders among female patients with breast cancer fosters the reduction of the psychiatric consequences of cancer during and after an oncology treatment session[72]. Kievisiene *et al*[73] stated that music therapy helps reduce adverse psychological effects resulting from the clinical manifestation and treatment of breast cancer. Similarly, music therapy intervention could assist people with breast cancer to ease the cardiotoxicity pain resulting from chemotherapy treatment consisting of anthracycline[74]. Thus, music therapy is efficient and recommended for the treatment of psychological disorders like depression and anxiety as well in people with breast cancer.

#### **Lung cancer**

Lung cancer is among the most prevalent type of cancer affecting people, with an estimated 1.8 million recorded cases as of 2012 and 2.21 million new cases, according to recent reports[3,75]. Patients with severe lung cancer experience excruciating pain. About 75% and 80% of these patients reported that pain management is inefficient in reducing the painful consequence of lung cancer[76]. Lung cancer is majorly treated using a chemotherapeutic approach which also has side effects. About 25% of 50% of people with small cell lung cancer were reported to experience psychological distress after chemotherapy[77]. The physical pains and psychological trauma associated with post-surgery and

**Table 1 Results on the significance of music therapy on people with the most common types of cancer**

| Ref.                          | Objective of the study   | Research designs/Methods  | Findings/Results  |
|-------------------------------|--|---|---|
| Romito <i>et al</i> [69]      | To measure the effects of music therapy and emotional expression on the reduction of negative emotions in patients undergoing chemotherapy for breast cancer   | 62 breast cancer patients were randomly recruited into the experimental and control group   | The combination of music therapy and emotional expression was identified to help reduce anger and depression that impacts the mental health of women with breast cancer   |
| Zhou <i>et al</i> [72]        | To examine the effects of music therapy and muscle relaxation training on depression and anxiety, as well as the length of hospitalization   | An intervention group of 170 patients was randomly selected and assigned to the study; a randomized controlled trial was conducted  | Depression and anxiety level reduction using music therapy  |
| Kievisiene <i>et al</i> [73]  | To explore the available reports on the effects of music therapy and art therapy interventions among breast cancer patients  | A systematic literature search was conducted in PubMed, EBSCO, and the Cochrane Central database. A total of 20 randomized controlled trials were systematically reviewed | Music therapy is commonly used for anxiety reduction during and after oncological treatment sessions  |
| Wang <i>et al</i> [83]        | To examine the effect on hemodynamics and analgesia of postoperative intravenous sufentanil combined with music therapy in patients with lung cancer in comparison to sufentanil alone                 | 60 lung cancer patients were randomly distributed to a music therapy group and a control group  | After lung cancer surgery, patients in the music therapy group were reported to have significantly low anxiety rate, heart rate, blood pressure <i>etc.</i> which would have resulted in a psychological disorder   |
| Mou <i>et al</i> [84]         | To examine the effects of passive music therapy on patients with lung cancer during the initial peripherally implanted central catheter implantation operation on their anxiety levels and vital signs | 304 lung cancer patients participated in the randomized controlled trial  | Blood pressure, heart rate, and anxiety decreased significantly among lung cancer patients in the experimental group. The findings indicate that music therapy is beneficial for lung cancer patients when they are undergoing central catheter insertion |
| Tang <i>et al</i> [86]        | To determine if six-step music therapy is effective in reducing pain and anxiety in patients with lung cancer receiving platinum-based chemotherapy and whether it improves sleep                      | Two groups-music treatment and a control group-each consisting of 100 patients with small cell lung cancer, were chosen at random   | Patients with lung cancer who receive music therapy report less discomfort, less worry, and better sleep  |
| Mishra <i>et al</i> [93]      | To explore how music therapy affects patients having a RALP after surgery  | 18 yr and older men (40 patients) undergoing RALP were randomly assigned to music and control group   | Music facilitates the comfort and reduction of narcotic usage among prostate cancer patients  |
| Yung <i>et al</i> [94]        | To ascertain how music therapy affects Chinese males having transurethral prostate resections in terms of pre-operative anxiety  | A quasi-experimental design involving 30 patients with TURP   | Music intervention is associated with a significant reduction in anxiety levels   |
| Smolen <i>et al</i> [99]      | To investigate the impact of music therapy on physiological and self-reported indicators of anxiety  | 32 adult patients scheduled for ambulatory colonoscopy were involved in the study   | Patients who are having colonoscopies benefit from music therapy as it reduces the level of anxiety   |
| Tanriverdi <i>et al</i> [100] | To determine how music therapy affects patients with early-stage colorectal cancer in terms of anxiety and chemotherapy-related nausea   | A randomized controlled trial involving 62 patients   | Music therapy was identified to be associated with a decrease in anxiety levels   |
| Li <i>et al</i> [101]         | To investigate the effects of music therapy on patients suffering from breast cancer in terms of their mental and physical state   | 25 to 65 years old female patients with breast cancer and receiving mastectomy were grouped into intervention and control groups  | Music therapy was found to be useful and significant in improving the mental and physical health of women with breast cancer  |
| Chirico <i>et al</i> [102]    | To access the efficacy of virtual reality and compare its effects with music therapy   | 30 breast cancer patients were recruited into VR and MT groups respectively and 34 who were receiving standard chemotherapeutic care were assigned to a control group     | Music intervention was discovered to be useful in addressing anxiety and facilitating the mental well-being of breast cancer patients   |

RALP: Robotically assisted laparoscopic prostatectomy; TURP: Transurethral resection of the prostate.

chemotherapy often harm the physical and psychosocial well-being of the lung cancer patient. While it is pertinent to provide adequate pain relief therapy for patients with lung cancer after surgery[78,79], the analgesia known as opioids which are commonly used to provide relief, has adverse side effects[80].

Music therapy is employed as an alternative intervention in managing pains associated with lung cancer that could lead to psychological distress, such as depression and anxiety disorders[81,82]. The aim is to enhance the patient's quality of life, promote longevity, and maintain the patient's mental health. The combination of music therapy with other care given to lung cancer patients after surgery helps reduce blood pressure, stress, anxiety disorder, and other psychological problems associated with lung cancer pain and trauma[83] and improves the general well-being of people living with lung cancer.

Music therapy is highly suggested for lung cancer patients undergoing any invasive clinical surgery[84] as it aids in improving the psychological issues resulting from both preoperative and postoperative surgery interventions. Studies have revealed that music therapy efficiently reduces adverse physical and psychological effects associated with terminal illnesses like cancer[77,85,86]. Music therapy, according to Tang *et al*[86], helps treat anxiety among patients with lung cancer. It is an efficient form of cancer care support that can be employed as a therapeutic means of improving lung cancer patients' psychological well-being[86] during chemotherapy or other treatment procedures.

### **Prostate cancer**

Prostate cancer is the leading cause of death for men in 48 countries and the most common cancer affecting men in 112 countries[55]. Similarly, prostate cancer is among men's most prevalent diagnosed cancer in 2022, accounting for 27% of diagnosed cases[17]. Death resulting from this type of cancer malignancy accounts for 37.5 per 100000 and 11.3 per 100000 in higher and lower Human Development Index countries, respectively[87]. Prostate cancer is treated using radical prostatectomy[88]. Although the use of robotic-assisted laparoscopic prostatectomy has contributed to the reduction of postoperative pain among prostate cancer patients, there is a need for further advancement in managing pain and other psychological issues associated with prostate cancer[89]. During the perioperative stage, anxiety and pain are commonly associated with cancer patients. According to Kühlmann *et al*[90], about 75% of surgery patients experience anxiety, increasing postoperative pain. Prostate cancer patients often develop severe anxiety due to concern over the diagnosed cancer and its impact on their sexual life[91, 92]. Music therapy has been identified as a helpful approach in supporting prostate cancer patients and reducing anxiety[93]. Also, for prostate cancer patients undergoing transurethral resection of the prostate (that is, a surgical procedure aimed at treating an enlarged prostate-related urinary issues), music therapy intervention efficiently reduces preoperative anxiety during surgery[94]. Therefore, research evidence has revealed that music therapy can be used to treat psychological problems such as anxiety disorder and depression associated with prostate cancer diagnosis and should be introduced during preoperative and postoperative care.

### **Colorectal cancer**

Men are highly susceptible to colorectal cancer, one of the leading causes of cancer death. In 2020, about 1.9 million people had colorectal cancer, and 935000 deaths were predicted to occur. Thus, accounting for one-tenth of all cancer cases and mortalities[55]. Colorectal cancer ranks second for death and third for incidence in men and accounts for 29 per 100000 on the higher Human Development Index (that is, an indicator of a country's performance in three of the major aspects of human development, namely health, education, and standard of living)[87,95,96]. Music therapy is used in addressing the psychological problems of colorectal cancer patients. A review of related research shows that a colorectal cancer patient listening to preferred music while having a sigmoidoscopy significantly lowers anxiety and increases comfort during surgery[97,98]. When music therapy was used, according to Palakanis *et al* [98], the patient's preferred music led to a decrease in the level of anxiety during sigmoidoscopy operations. Music therapy can potentially reduce anxiety and other indicators of psychological disorders among colorectal cancer patients undergoing colonoscopy[99]. Music therapy also reduces anxiety levels among patients with colorectal cancer during chemotherapy sessions[100]. Thus, music therapy intervention is efficient in supporting patients with colorectal cancer to adjust to psychological issues like depression and anxiety associated with a cancer diagnosis. Conversely, research on the effectiveness of using music as a kind of therapy to help people with colorectal cancer cope better with procedures like sigmoidoscopy or colonoscopy and to lessen their anxiety has been fragmentary.

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## **RESEARCH IMPLICATIONS AND RECOMMENDATIONS**

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Music therapy improves the mental and physical state of people with cancer[101,102]. While cancer diagnosis and treatment procedures are linked to substantial financial costs[103], music therapy's cheap costs, absence of side effects, and significant benefits in reducing stress are crucial for the prevention and treatment of psychological issues caused by cancer and its diagnosis[104]. People with various kinds of cancer tend to suffer from psychological disorders like depression and anxiety, as stated earlier in this paper. Most cancer patients, as well as their families, music therapists, and medical experts feel optimistic about the remedies provided by music therapy[105]. Because the use of music therapy significantly lessens anxiety and depressive symptoms associated with cancer[106], it is vital for practitioners to continue to examine the significance of music therapy in addressing these psychiatric disorders among patients with various types of cancer malignancy.

A large percentage of cancer mortality could be attributed to depression and anxiety disorders resulting from cancer diagnosis and treatment. However, accessing the psychological state of people with cancer before and after clinical diagnosis and treatment is essential to reducing cancer death. The findings of this review are essential to medical practice and policy concerning oncological disease and treatment procedures. It is, therefore, pertinent to investigate and address the psychological disorders

observed in people with cancer. Because music therapy has been found to be significant in treating depression and anxiety in people with cancer, music therapists should be among the medical team treating cancer patients.

Medical practitioners who provide medical care to people with cancer should endeavor to examine the psychological health of cancer patients under their care. Given the significance of music therapy in reducing anxiety levels and treating depression in people with breast cancer, lung cancer, prostate cancer and colorectal cancer, it is therefore pertinent for the oncologist collaborate with qualified music professionals in order employ music therapy during the treatment of cancer patients. Music therapy should also be incorporated into medical, radiation, and surgical oncology curriculum. A further empirical study should be conducted to obtain more research on this issue.

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## CONCLUSION

Identifying the symptoms of mental illness in cancer patients is essential for managing their mental health. Cancer deaths may occur due to the inability to address the psychological disorders associated with cancer diagnosis among people with any of the most common cancer types. Music therapy has been identified to be significant in treating psychological issues like depression and anxiety that many cancer patients experience. It is needful for healthcare providers to incorporate music therapy interventions while treating people with cancer. This will help reduce cancer deaths resulting from psychological disorders rather than the killer disease, cancer. However, the standardized procedures and evaluation criteria for applying music-based intervention strategies in oncology medicine still need to be further established and improved.

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## FOOTNOTES

**Author contributions:** Eseadi C and Ngwu MO conceived the study; Eseadi C and Ngwu MO designed the study, conducted the literature review and were all responsible for the analysis, drafting, editing, and approval of the final version of this manuscript.

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