Exploring the role of music listening in cancer care: A systematic literature review

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I declare that this thesis/dissertation / mini-dissertation is my own original work. Where secondary material is used, this has been carefully acknowledged and referenced in accordance with university requirements. I understand what plagiarism is and am aware of the university policy and implications in this regard.

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Abstract

Cancer is a worldwide health concern with a high mortality rate. Along with this high mortality rate, individuals diagnosed with cancer face multiple challenges. This systematic literature review aimed to explore the role of music listening in cancer care, specifically looking at what types of interventions are used and what role music listening can play for individuals diagnosed with cancer. Thirteen papers met the inclusion criteria set out for the study. Thematic analysis of the findings from 13 articles demonstrates how music listening supports symptom reduction, coping, enhanced quality of life, cognitive benefits, and a sense of connectedness. In addition, the findings showed the different types of music listening interventions used in cancer care settings, which included: Guided Imagery and Music (GIM), pre-recorded music (e.g., CD players), live music listening, music and imagery, receptive music therapy, and combined group receptive music listening interventions. The findings also demonstrate that music listening as a non-pharmacological intervention is not only deemed effective but also feasible, cost-effective, and non-invasive in the context of cancer care. Recommendations for further research are suggested, specifically looking at the implementation and duration of interventions.

Dedication

Through my studies, I have had the incredible opportunity to explore and deepen my understanding of music interventions. I dedicate this paper to all those who have battled cancer. This work is a small contribution toward integrating a more holistic approach into cancer care, hoping to bring comfort, healing, and support to those who need it most.

Acknowledgements

To Carol: Thank you for graciously walking with me through this journey. You have played an essential role not only in my research but also in my music therapy journey. Your guidance, wisdom, and support have been invaluable. You have been the best mentor, counsellor, and supervisor, always believing in me even when I doubted myself. I am deeply grateful for the way you have seen and nurtured the greatness within me.

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Most importantly, I sincerely thank God for this incredible opportunity to study something I never knew I would love this much. Thank you for the gift of music and the privilege of using it to bless others.

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Chapter 1: Introduction

1.1 Background and Context

Cancer represents a significant global health concern due to its high mortality rate. According to the World Health Organisation (2021), cancer is estimated to have 10 million fatalities per year. Individuals diagnosed with cancer are impacted across various dimensions. These include physical, psychological, emotional and social aspects (Li et al., 2013). In addition to standard medical care, the multidisciplinary approach to cancer treatment encompasses addressing patients' psycho-social needs through various therapeutic modalities, such as music therapy and music medicine (Cassileth & Deng, 2004). Recent research has indicated that music therapy and music medicine interventions have proven effective in supporting cancer patients (Singh & Chaturvedi, 2015; Stanczyk, 2011). Music therapy has been shown in numerous studies to assist cancer patients in managing anxiety, depression, and discomfort (Bradt et al., 2016; Loomba et al., 2018; Nair et al., 2016). Within music therapy, music listening, also referred to as receptive music therapy, is included in the treatment to address a variety of goals (McFerran & Grocke, 2022). More broadly, in the cancer care field, music listening is an often-included intervention (Bradt et al., 2016) employed by a range of health professionals in oncology settings (da Silva Santa et al., 2021; Bradt et al., 2016). My interest in conducting this research stems from my personal experience of a family member diagnosed with cancer and my curiosity about how music listening may play a role in supporting individuals living with the various struggles associated with living with cancer.

1.2 Problem Statement

A cancer diagnosis presents individuals with complex physical, psychological, and emotional challenges that often persist throughout the course of the illness and treatment (Altun & Sonkaya, 2018; Hui, 2014; Rani & Bayu, 2021; Sano & Fushimi, 2017; Vardy et al., 2022). As part of supportive care, music listening has been increasingly recognised for its potential to improve mood, reduce anxiety, enhance relaxation, and contribute to overall quality of life (Bilgiç & Acaroğlu, 2017; Lima et al., 2020; Spilioti et al., 2017). While such interventions are employed both within and beyond the scope of music therapy, the literature lacks a comprehensive synthesis that maps out the scope, implementation, and efficacy of music-listening interventions across cancer care settings. Currently, there is limited understanding of how these interventions are applied and what outcomes they produce. Addressing this gap is essential for informing clinical practice and guiding future research. A systematic literature review is therefore warranted to critically examine the types of music-listening interventions used in cancer care, evaluate their reported benefits and explore their feasibility as a non-pharmacological support for individuals living with cancer.

1.3 Aims

This study aims to explore the body of literature on the use of music listening for cancer care and identify the role, application and reported benefits of music listening in cancer care. By investigating existing literature, this research aims to contribute insight into the varied ways in which music listening can support individuals through cancer care.

1.4 Research Questions

According to the literature, what types of music-listening interventions are used in cancer care?
As reported in the literature, what role can music listening play for individuals diagnosed with cancer?

1.5 Chapter Overview

The next chapter (Chapter 2) provides a concise overview of the existing literature and information relevant to the research question, laying the foundation for the study. Chapter 3 outlines the methodology employed, detailing the processes followed in the review. Chapter 4 reports on the steps undertaken to conduct the systematic literature review, provides an account of the thematic analysis of the findings of the selected articles and presents the findings from the analysis. Chapter 5 offers a comprehensive discussion of these findings in relation to the research questions and is supported by relevant literature, with a concluding section on implications for practice. Lastly, Chapter 6 concludes the study, summarising key insights and offering final reflections on the systematic literature review.

Chapter 2: Literature Review

2.1 Introduction

With increasing incidence and high mortality rates, cancer is a significant worldwide health issue. This research explores how music listening is employed in the field of cancer care. This literature review discusses literature related to cancer care and the role of music in health care, the therapeutic use of music listening, and problematic music listening. Additionally, the literature review discusses various music listening interventions such as relaxation and music listening, personalised playlists, art and music and guided imagery and music (GIM). This literature review presents research that explores the therapeutic potential of music-listening interventions in cancer care.

2.2 Cancer Care

The overall management of cancer patients includes chemotherapy, targeted medicines, immunotherapy, hormonal treatments, radiological procedures, and surgical interventions such as biopsies, tumour removal or reduction, and organ transplants (Debela et al., 2021; Shams et al., 2023). These therapies are regularly given to people who have been diagnosed with cancer, some of which are accompanied by adverse side effects. A cancer diagnosis has a profound effect on individuals on many levels, including emotions, physical health, and mental health. Asbury et al. (2014) highlighted the complex issues of communicating such diagnoses to others. Vardaramatou et al. (2021) expanded on these findings, emphasising the compounding influence of inherent uncertainty and the resulting life-changing adaptations necessary for individuals diagnosed with cancer.

2.2.1 Chemotherapy

Cancer treatment can compound these challenges, adding to the emotional, physical, and psychological burdens faced by individuals. Chemotherapy can cause harsh side effects such as nausea, fatigue, insomnia and pain (Carlson et al., 2019). A study by Coates et al. (1983) identified various physical symptoms (see Figure 1).

Figure 1

Physical Symptoms of Chemotherapy

1. Feeling sick (nausea)
2. Being sick (vomiting)
3. Itching at injection site
4. Shaking all over
5. Change in the way things taste
6. Changes in how things smell
7. Not having regular bowel action (constipation)
8. Loss of liquid or frequent bowel action (diarrhoea)
9. Pins and needles in fingers or toes
10. Numbness in fingers or toes
11. Loss of weight
12. Weight gain
13. Increased hair growth on legs
14. Constantly tired
15. Giddiness on standing up
16. Loss of appetite
17. Sore mouth
18. Sore throats
19. Shortness of breath
20. Skin rash
21. Bruise easily
22. Difficulty sleeping
23. Pain passing water (painful urination)
24. Coloured urine
25. Ringing in ears
26. Deafness
27. General aches and pains
28. Tummy ache (abdominal pain)
29. Swollen tummy (abdominal fullness)
30. Periods stop
31. Periods become irregular
32. Changes in skin colour
33. Hot flushes
34. Heart beating fast (palpitations)
35. Headache/migraine
36. Loss of hair
37. Increased thirst
38. Passing more water than usual (increased urination)
39. Dry skin
40. Acne (pimples)
41. Increased appetite
42. Trouble with swallowing
43. Nose-bleeds
44. Cannot taste things
45. Fingernails go brown

Note. According to Coates et al. (1983),

Patients grappling with cancer continue to confront the persistent burden of physical symptoms, as substantiated by recent research (Rani & Bayu, 2021; Hui, 2014; Sano & Fushimi, 2017; Altun & Sonkaya, 2018). Nevertheless, the challenges extend beyond the realm of physical afflictions. These encompass a broad spectrum of non-physical challenges, spanning psychological, emotional, and social domains (Vardy et al., 2022). Such multifaceted adversities, including anxiety, depression, and social isolation, are integral components of the cancer experience, often exacerbating the overall distress faced by patients and impacting their quality of life.

2.2.2 The physical toll of living with cancer

Whilst the physical challenges of chemotherapy have been highlighted, it is equally important to recognise that the physical impacts go beyond chemotherapy-related challenges for individuals diagnosed with cancer. Many individuals diagnosed with cancer face the effects of high levels of fatigue, which impacts them physically and their energy levels. A study conducted by Hinz et al. (2020) demonstrated that there were significantly higher fatigue levels in individuals diagnosed with cancer compared to the general population of individuals not diagnosed with cancer. Another physical toll that many people with cancer experience is pain. According to Beck et al. (2010), cancer-related pain is a complex experience that includes difficult neuropathic pain from nerve damage, unexpected breakthrough pain, and acute and chronic physical pain brought on by cancer or its treatments. This pain experienced by cancer patients may also lead to many individuals not having the will to live or complete cancer-related treatments (Daut & Cleeland, 1982). Woodforde and Fielding (1970) conveyed that pain can extend beyond the physical realm, encompassing psychosocial elements of pain, which will be explored later in this literature review. It has been highlighted that it is not only the individual diagnosed with cancer who experiences physical changes and challenges, but also how others respond to these changes. The altered body, often beyond the patient’s control, impacts self-perception and social interactions. These physical changes could be from weight loss, loss of hair, skin texture changes and possible limb amputation due to the removal of a cancer tumour (Chelbowski et al., 2002; Dua et al., 2017; Vogelzang & Ratain, 1985; Huynh et al., 2023). Pedersen et al. (2013) described patients’ feelings of alienation, with one explaining how radiation therapy made it challenging to recognise themselves and feel comfortable around others. At the same time, another noted avoidance behaviours from people due to her visibly altered appearance (Pedersen et al., 2013).

2.2.3 The emotional challenges of living with cancer

Individuals living with cancer often face significant emotional challenges, including shock, dread, anxiety, depression and uncontrollable feelings of uncertainty and mortality (Guo et al., 2023; Crump et al., 2024; Cooper et al., 2023). A paper by Hughes et al. (2024) highlighted three main emotional impacts of cancer: anxiety from uncertainty and isolation, anger at healthcare delays and lack of support, and persistent fear of recurrence. Fear of cancer recurrence is known as the progression of cancer, which is a common challenge that cancer patients face, often going unaddressed (Bergerot et al., 2022). Some of these emotional tolls can be a challenge to manage. Managing life with cancer, whether as a newly diagnosed patient or during ongoing treatment, often brings overwhelming stress and emotional difficulties. The effects of stressors on the body are influenced by their duration, scope, and severity, as well as various psychosocial factors that accompany them (Wiedenfeld et al., 1990).

2.2.4 Psychosocial aspects of living with cancer

As previously mentioned, living with cancer results in physical and emotional challenges, but it also extends to the psychosocial aspects of life. Being diagnosed with cancer can often adjust one’s identity. Park et al. (2009) elaborate further by discussing how experiencing cancer usually requires incorporating the journey into one’s self-concept, which may involve forming new identities. This could be one’s conception of their new identity, but possibly how others perceive them. In terms of families, the roles within the family may change if a member has cancer. Shan et al. (2017) stated that family is the primary support system for many cancer patients. This support may be through physical care, emotional support, assisting with financial needs, and meeting social and practical needs (Northouse et al., 2010; Breuning et al., 2024). Although there is support from family and caregivers, many patients with cancer feel isolated and have an attached stigma to the disease. Bray et al. (2015) elaborated that the stigma associated with cancer frequently results from ignorance and false information about the illness, which feeds into patient-isolating stereotypes. Furthermore, feelings of loneliness, sadness, and anxiety can be made worse by social isolation and stigma, which emphasises the value of creating networks of support and lowering stigma via advocating and education (Chambers et al., 2012).

2.2.5 The Spiritual Element in Cancer Care

As it has been previously stated, patients are deeply affected by a cancer diagnosis, and this can cause individuals to consider their mortality (Lee, 2008; Tarbi & Meghani, 2019; Vos, 2015). According to Nagy et al. (2024, p. 1), “the burden of cancer continues to impact individuals and communities worldwide despite advancements in treatment and prevention strategies”. They further explained that many patients seek either spiritual or religious comforts. According to Koenig (2012), spirituality is a personal and often individual connection to the transcendent or sacred, whereas religion is an organised system of communal beliefs and practices designed to facilitate such a connection and guide moral living. Weaver and Flannelly (2004) suggest that spirituality and religion are a coping mechanism and a beacon of hope. When considering a more holistic approach to cancer care and symptom management, several academics and practitioners have started investigating how spirituality might improve and/or play a role in patients' quality of life and general well-being (Nagt et al., 2024; Pascal & Endacott, 2010). According to Murthy (2024, p.274), “There is growing interest in spirituality in cancer care worldwide”, reflecting its evolving role in cancer care.

The phrase "music is universal" is often cited to suggest that music can connect individuals across languages, geographic locations, ages, and demographics. Numerous scholars and researchers have critically examined and challenged this notion (Campbell, 1997; Higgins, 2012; Letts, 1997), but in essence, many of these researchers highlight the connection potential of music. Crossley's (2020, p.6-7) book explores the uniqueness of music connections, and he states that music is an important thread in the fabric of the social world. It is a form of social interaction; one amongst many forms that concatenate, interpenetrate and overlap in the ongoing process that generates, reproduces and transforms societies in their various local, national and global manifestations”. This statement solidifies how music can form social interaction and connect individuals that transcend their language and cultural boundaries. Beyond its social dimensions, however, the music carries profound spiritual implications. Music serves as a vehicle for transcendent spiritual experiences, tapping into deep emotional and psychological states that words alone often cannot capture (Moss, 2019; Joseph, 2014; Bist et al., 2024). Music allows individuals to explore the depths of their inner worlds, evoking feelings of awe, peace, and connection to something greater than themselves.

2.3 The Therapeutic Use of Music in Cancer Care

Music has long been a way of communicating, telling stories, and creating entertainment, and it is often used for ceremonial or religious purposes. Not only does music have the previously mentioned attributes, but it has also been used as a form of healing. According to Montinari, Giardina, Minelli, and Minelli (2018, p.98), "Music always has been perceived to have healing powers, and the entire history of civilisation contains aspects that link music to physical and mental healing". Though the term' music therapy may not have been used many years ago, the *notion* of music therapy dates back centuries. According to Gaston (1968, p.1), "Music and therapy have been close companions, often inseparable, throughout most of man's history". Davis & Hadley (2016, p.18) state that "an analysis of the practices of medicine and psychiatry over many hundreds of years reveals that many forms of treatment, including music, have been used to ameliorate physical and mental illnesses". This information proves that music has been identified as a valuable tool in health care.

Since music has been noted as a helpful resource, it has been used in various contexts within cancer care. For example, during treatments like chemotherapy or radiation, music therapy interventions are used in therapeutic settings to promote general mental well-being, reduce anxiety, and relieve pain (Burns et al., 2005). According to O'Callaghan (2001), music is used in cancer palliative care to promote comfort and relaxation during end-of-life care. Furthermore, songwriting and music-making activities in psychosocial group settings facilitate emotional expression, increase coping strategies, and strengthen social ties—all of which improve quality of life (Robb et al., 2011). All of the papers mentioned in this paragraph focused on active music-making methods. This systematic literature review will explore and focus on what music listening can offer in cancer care.

2.3.1 The Therapeutic Role of Music Listening in Cancer Care

2.3.1.1 Music Listening

Extensive research has been conducted about the therapeutic potential of music listening in cancer care. These investigations highlight benefits such as enhanced relaxation, improved quality of life, optimised stress and pain management, and reduced anxiety (Ahern et al., 2009; Rao et al., 2021; Blichfeldt-Ærø et al., 2019). Other research emphasises the benefits of introducing music interventions into medical and healthcare settings, emphasising its positive results and potential effects (Dimopolous-Bick et al., 2019; Blichfeldt-Ærø et al., 2019; Xu et al., 2021).

In particular, several studies have investigated the potential benefits of music listening in mitigating the side effects of chemotherapy. For example, Cassileth et al. (2003) conducted a randomised controlled experiment demonstrating that music therapy significantly improved mood disturbance in patients undergoing autologous stem cell transplantation. A systematic review by Bradt et al. (2016) highlighted that listening to music could enhance physical and psychological outcomes in cancer patients. Additionally, research by Ghetti et al. (2019) suggests that music therapy and/or music listening might alleviate symptoms of pain and anxiety.

Furthermore, music's potential to reduce stress and anxiety levels, enhance mood states, and promote relaxation and calmness is supported by studies conducted by Bradt et al. (2016), Cassileth et al. (2003), Gutgsell et al. (2013), Thoma et al. (2013) and Fernando et al. (2019). These studies collectively indicate that music can benefit cancer patients by reducing distress and enhancing emotional well-being. Furthermore, Schäfer et al. (2013) have identified music listening as a potential coping strategy for managing these symptoms. Music has also been found to empower individuals facing stressful situations, giving them a sense of control over their emotions (Li et al., 2012).

Research has further reported that music-based interventions have been found to support cancer patients (Singh & Chaturvedi, 2015; Stanczyk, 2011) and assist with managing anxiety, depression and discomfort (Bradt et al., 2016; Loomba et al., 2018; Nair et al., 2016). The study of how music can aid in cancer treatment is gaining more and more attention from academics and medical professionals within and beyond the discipline of music therapy (Daykin et al., 2006). The specific focus of this research is the role of music-listening interventions in cancer care.

2.3.1.2 Problematic Music Listening

In the context of music listening in cancer care, it is essential to acknowledge the potential for problematic music listening alongside its therapeutic benefits. Music therapists, healthcare practitioners, or anyone implementing a music-listening intervention must recognise that while music can offer significant advantages and benefits, it may also present challenges. To ensure that music listening interventions are tailored to each patient's specific needs, the implementers must be attentive to the potential for certain types of music that may be distressing or triggering for the patients. Understanding these factors is crucial in selecting appropriate music and avoiding unintended negative or trigger effects within the therapeutic process. McFerran and Grocke (2022) highlight the possible negative aspects of music listening. For example, they argue that regular music consumption behaviours may increase problems when combined with rumination. According to McFerran and Grocke (2022, p. 61), "the habits people form for music listening can become problematic when paired with ruminative thinking". Lozon and Bensimon (2014) discuss several factors contributing to problematic music listening, such as lyrics and themes, emotional regulation, group dynamics, and media impact.

There is a lack of research on problematic music listening within the context of cancer care. However, emerging literature suggests that music, while often beneficial, may also evoke or intensify negative emotional states in vulnerable populations. McFerran (2016) highlights the potential adverse effects of music, particularly among individuals managing intense emotions. She emphasises that sad music may simultaneously elicit pleasure and amplify distress, indicating that listeners in emotionally fragile states, such as those undergoing cancer treatment, may require additional therapeutic support. Moreover, the context in which music listening takes place—whether solitary, guided, intentional, or incidental—may significantly shape its impact. This presents an important area for further research, particularly in identifying how to tailor music listening interventions appropriately within different cancer care environments.

2.4 Music Listening Interventions

Music listening interventions are receptive interventions, which "involve listening to either live or recorded music, that can be provided by either a health professional or music therapist, and relies on the music listening experience as the primary therapeutic component" (Howlin & Rooney, 2020). The following section will briefly review the different types of music listening interventions, such as relaxation and music listening, personalised playlists, music and art, and Guided Imagery and Music (GIM). Furthermore, the upcoming systematic literature review will explore music-listening interventions in depth.

2.4.1 Relaxation and Music Listening

Grocke and Wigram (2007) stated that various professionals, such as teachers, nurses, yoga instructors, and music therapists, use relaxation methods. Pre-recorded music or live music performed in therapy sessions is used to facilitate relaxation. A study has shown that listening to music may enhance relaxation in various ways (Davis & Thaut, 1989). In their research, they suggested that music that is perceived as soothing and pleasant has the potential to improve and promote psychological and physiological relaxation. Their findings identified that participants felt calmer and more at ease while listening to their preferred music. The participants physiologically displayed a lower heart rate and reduced cortisol levels in their bodies, indicating a relaxation response (Davis & Thaut, 1989).

2.4.2 Personalised Playlists

Personalised playlists have been applied in several contexts, including hospice inpatient units (IPUs), public healthcare settings, schools for children, mental health institutions, and palliative care, to mention a few (Donaldson et al., 2019; Dimopoulos-Bick et al., 2019; McFerran & Grocke, 2022; Johnston et al., 2022). In receptive music therapy, McFerran and Grocke (2022, p.68) define playlists as “an intentionally sequenced and purposefully selected set of songs that are meaningful to an individual or group in addressing a therapeutic goal”. In the cancer care context, a recent study conducted in 2021 by Lynch et al. explored the difference in music therapy passive (receptive) and active (interactive) interventions for cancer patients. The different interventions for cancer patients were to identify the perceived benefits of coping with cancer-related symptoms. Regarding receptive (passive) music interventions, research has highlighted the therapeutic potential of personalised playlists within healthcare settings (Lynch et al., 2021). Studies such as those by Schneider (2018), Garrido et al. (2018) and Kulinski et al. (2022) have significantly contributed to this growing field, conveying the impact that personalised playlists can have. These studies offer evidence supporting the effectiveness of personalised playlists in alleviating anxiety, enhancing overall well-being, and even mitigating pain. Furthermore, according to McFerran and Grocke (2022, p.72), common uses for playlists include mood management, emotion processing, life review, sleep promotion, diversion, relaxation, agitation reduction, identity work, relationship building, orientation and focus, and activity support. Given the demonstrated advantages of personalised playlists, it is noteworthy that they have not yet been thoroughly explored in the context of cancer care.

2.4.3 Music, Imagery, and Visual Art Techniques

The following music listening techniques combine art mediums and music. These are drawing to music, music, drawing and narrative, the Tree of Life methodology (ToL) and Guided-Imagery and Music (GIM).

2.4.3.1 Drawing to Music

This approach, a fusion of receptive music listening and art, is designed to provide therapeutic benefits. The materials used can be as simple as watercolours, pencils, paint and crayons. Here's how it works: The client is invited to draw or paint on paper while listening to music. It's a simple yet powerful way to engage with art and music. McFerran and Grocke (2022) affirm that this process can be highly beneficial, as the art created often leads to profound insights and realisations. In Rosling and Kitchener's paper (1993), they found that drawing to music helps improve mood, increase engagement, enhance receptivity and aid social interaction among individuals.

2.4.3.2 Music, Drawing, and Narrative (MDN)

MDN is an approach closely aligned with the Bonny Method of GIM (Booth, 2005). This method integrates music, drawing, and storytelling within structured sessions. Individuals listen to a piece of music and engage in a drawing activity that allows them to personally express their emotional response to the music (Booth, 2005). The structure of this approach follows a sonata form such as exposition, development, recapitulation and coda (McFerran & Grocke, 2022). According to Booth (2005), this is the process of MDN: The exposition phase begins with themes explored. With a supportive approach, the therapist assesses the client's mood and energy levels, and the therapist chooses the music. The therapist guides the client into a relaxing state, creating a safe space to become aware of the evoked feelings. The client starts to use an art medium as the therapist, with understanding, observes. In the developmental stage, the client continues drawing sketches, which the therapist, with guidance, still observes. The recapitulation phase follows, and the same music is played again as the client writes a narrative about the drawing they had created with the therapist's support. Lastly, in the coda phase, the critical aspects are highlighted, and the client is encouraged to share the process, knowing that the therapist is there to listen and understand.

2.4.3.3 The Tree of Life

The Tree of Life methodology is an integrative therapeutic process in which individuals draw a tree symbolising various parts of their lives. This approach was developed by Ncazelo Ncube-Mlilo and David Denborough (Stubbes, 2022). Ncube first introduced this tool in 2003 to children who had been affected by HIV/Aids in East and Southern Africa (Ncube, 2006). The process uses drawing and music as its medium to explore individuals' identities, histories, and future dreams. This is a four-part process where individuals draw a tree, and each part symbolises their life, such as "roots (where they come from), their sense of self, skills and knowledge (the trunk), their hopes and dreams (the branches)" (McFerran & Grocke, 2022, p. 143). The therapist chooses music that enhances the reflective process. This process aims to encourage individuals to speak about their lives in a way that makes them stronger (McFerran & Grocke, 2022).

2.4.3.4 Guided Imagery and Music (GIM)

Guided Imagery and Music (GIM) is a “music-centred, consciousness-expanding integrative therapy developed by Helen Bonny” (Grocke, 2019, p.4). GIM is a guided receptive music listening experience where the therapist acts as the “guide” whilst the client is the “traveller” in this experience (Clark, 2019, p.15). The trained GIM therapist guides the client to relaxation to access their inner emotions and experiences through the support of pre-recorded selected music and imagery prompts (Clark, 2019, p.15). The session is structured as follows: 1) the opening conversation, 2) relaxation induction, 3) the music-imagery experience, 4) the return, and 5) the closing conversation (Abbott, 2019). This approach's benefit is gaining “embodied experience of deeper relation, or insight into life problems” (McFerran &

Grocke, 2022, p.12).

2.5 Conclusion

The literature review has discussed music listening in the context of cancer care, investigating its possible therapeutic advantages while acknowledging challenges. Traditional cancer treatments, such as chemotherapy, target physical symptoms, but they frequently overlook emotional and psychological difficulties. Music listening interventions, such as relaxation methods, personalised playlists, art and music and Guided Imagery and Music (GIM), have shown potential in reducing non-physical adversity and improving general well-being. Further investigation is needed to determine how these treatments might be effectively incorporated into cancer care settings to give complete support to patients dealing with multiple challenges in a cancer context. Hence, the following systematic literature review discusses how music-listening interventions can affect patients in cancer care.

Chapter 3: Methodology

3.1 Systematic literature review

This study is structured as a systematic literature review. According to Nightingale (2009, p.381), a systematic literature review “aims to identify all research addressing a specific question so that they gives a balanced and unbiased summary of the literature”. A systematic literature review allows researchers to summarise a broad collective of information relating to a topic and/or research question. Thomas and Harden (2008) conveyed this by describing how a systematic literature review is based on common themes and has conclusions similar to the reviewed articles. As the researcher, I investigated and summarised the role of music listening in cancer care.

3.1.1 Integrative Literature Review

An integrative literature review is the most extensive review approach, allowing for the inclusion of both experimental and non-experimental research to acquire a comprehensive picture of the analysed phenomena (Souza et al., 2010). Furthermore, Souza et al. (2010) conveyed that an integrative literature review combines material from theoretical and empirical literature to serve various goals, including concept definition, theory and evidence evaluation, and methodological analysis of a given topic. This study was structured as an integrative literature review, combining research and studies using various approaches and methods. Hence, as the researcher, I was given a more expansive and comprehensive overview of the study topic. Elsbach and Knippenberg (2020) defined an integrative literature review as a research process that methodically evaluates and synthesises the literature on a specific issue, resulting in new perspectives and frameworks. They emphasised the distinctness of integrative reviews, stating that they may stand alone as a type of study and frequently result in original contributions to the field, such as new conceptual frameworks or ideas.

3.2 Review Protocol

A researcher must ensure the review's objectivity in conducting a comprehensive search for all relevant studies (Bettany-Saltikov, 2012). As previously mentioned, this study used a systematic procedure with specified inclusion and exclusion criteria to answer the research questions as comprehensively as possible**.** The literature that was included in this study is peer-reviewed articles and published literature from journals, books, and dissertations. These were found in the following different databases:

- PubMed
- SAGE
- MEDLINE
- MDPI
- ScienceDirect
- Google Scholar
- PsycINFO

Figure 2 below will indicate which search terms will be used in the search strategy.

Figure 2

Interventions		**And**	**Diagnosis**
"Music Listening"	"Receptive Listening"	Music	"Cancer"

3.2.1 Inclusion and Exclusion Criteria

3.2.1.1 Inclusion Criteria

The inclusion criteria for this study are relevant literature that answers the research questions of this study.

3.2.1.2 Types of Studies

The types of studies that are included in this systematic review will be as follows:

a) Qualitative, Quantitative and mixed-methods designs
b) English-published literature and/or translated into English
c) Published Literature between 2000 and 2024

3.2.1.3 Types of Participants

The types of participants for this case study consisted of individuals diagnosed with cancer.

3.2.1.4 Types of Interventions

The primary intervention of this study looked solely at music listening.

3.2.1.5 Types of Outcomes

This literature review does not focus on specific outcomes of music listening but aims to explore various interests.

3.2.1.6 Exclusion Criteria

For this systematic literature review, the following literature is excluded:

a) Non-English literature publications
b) Literature predating the year 2000
c) Systemtic Literture reviews
d) Meta-Analyses

3.3 Data Extraction and Analysis

The data extraction and analysis method involved carefully examining publications that matched the inclusion criteria and extracting relevant material to answer the research questions. Using a comprehensive search approach, chosen articles and literature were captured in an Excel spreadsheet with information such as title, author, publication date, methodological design, participant sample size, research design, and data-collecting technique. After the articles were synthesised, data extraction followed using a standardised form that included information about music listening and cancer care, which contributed directly to answering the main research question. This organised data extraction method assures consistency and efficiently retrieves relevant information (Taylor et al., 2021). By following this strategy, the possibility of mistakes and bias was reduced, increasing the dependability of the results. Following data extraction, the obtained data were thematically analysed by identifying and interpreting patterns of meaning to determine the efficacy of music listening in cancer care (Clarke & Braun, 2017).

3.4 Research quality for systematic review

The systematic review technique was designed to reduce bias and promote transparency in the review process. This was achieved through explicit and systematic approaches to research selection, quality assessment, and objective summary (Liberati et al., 2009; Petticrew, 2001). Khan et al. (2003, p.39) defined *quality* as the "degree to which a study employs measures to minimise bias and error in its design, conduct, and analysis." By implementing these rigorous and organised techniques, high quality was ensured in this systematic literature review, as demonstrated in Chapter 4. Furthermore, the SURE (Supporting the Use of Research Evidence) appraisal quality checklist tool was implemented to enhance the quality and reliability of systematic reviews by providing a standardised approach to study selection and data extraction (Higgins & Green, 2011). The Mixed Methods Appraisal Tool (MMAT) was implemented to identify the quality of the mixed-methodology studies. The MMAT aimed to assess the methodological quality of various study designs, including mixed methods studies (Hong et al., 2019).

3.5 Ethical Considerations

The ethical considerations in systematic literature reviews were critical to ensuring the integrity and credibility of the research process. Suri (2020) emphasised the necessity of eliminating publication bias and analysing the quality of literature, and numerous other ethical problems are worth noting in this context. Furthermore, the research within a systematic literature review was vigilant in identifying and addressing any biases in the articles used for the systematic review (Uman, 2011). Avoiding plagiarism was also an ethical consideration for a systematic literature review. The researchers must adequately attribute the authors of the studies they will use in their systematic literature review (Nepomuceno & Soares, 2020).

3.6 Conclusion

Chapter 3 covered the rationale for using a systematic literature review technique to investigate the function of music listening in cancer care. The review offered a thorough examination of the current body of literature by synthesising several studies, adhering to inclusion and exclusion criteria, implementing rigorous data extraction, employing quality evaluation procedures and making every effort to minimise the risk of bias

Chapter 4: Analysis and Findings

4.1 Introduction

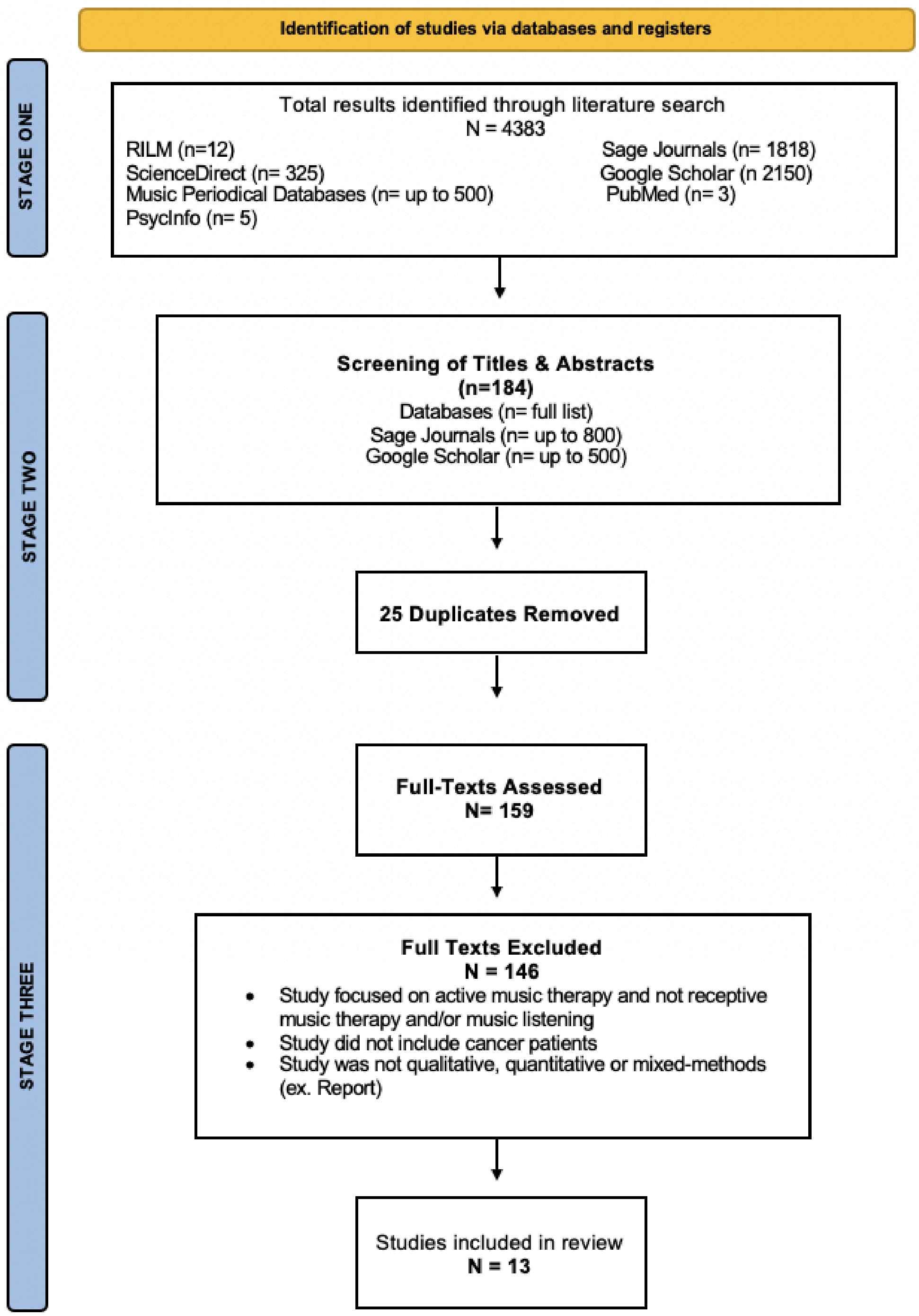
This chapter provides a detailed account of the systematic review and analysis conducted. It outlines the detailed search process used to select the final thirteen studies and provides a detailed overview of each. The findings of the thirteen studies were analysed using thematic analysis, which is described towards the end of the chapter.

4.2 Data Collection

This literature search followed PRISMA guidelines, and the diagram below (Figure 2) outlines the process. The initial stage of the literature search used the main key terms such as “music listening”, “receptive music therapy”, and “cancer” across the selected databases (RILM, Sage Journals, ScienceDirect, Google Scholar, Music Periodical Databases, PubMed, and PsycINFO). With careful consideration and the supervisor's guidance, two databases were excluded, MEDLINE and MDPI, as they yielded little to no relevant literature. The selected key terms across various databases yielded 4,383 results. In the second stage of the search, titles and abstracts of the papers were screened across all databases, except for Sage Journals (up to 800 results) and Google Scholar (up to 500 results), leading to the identification of 189 relevant studies. The inclusion and exclusion criteria were considered during screening during this second stage. From the 189 results, 25 duplicates were removed, and 159 studies remained. This process's third and final stage involved evaluating the full texts of 159 studies. Of the 159 papers, 18 seemed relevant to this systematic literature review. Various texts excluded from the final chosen papers did not meet the inclusion criteria of the methodology, and the diagnostic picture did not focus exclusively on patients diagnosed with cancer. All 18 papers were documented in table form, and to ensure a non-biased approach, the supervisor and the researcher systematically evaluated each paper's results in the final 13 studies (Table 1). The most critical thing to note is that the inclusion criteria focus solely on music listening and receptive music therapy, and not active music therapy. To broaden the scope of this systematic literature review, it is essential to recognise that music listening can extend to practices beyond the context of music therapy. These key terms would allow the systematic literature review to comprehensively explore the therapeutic benefits and applications of music listening in different settings. For example, two studies (8 and 10) were included in the systematic literature review due to their significant findings related to music listening despite involving other interventions. Even though both studies use music listening as a component of a more comprehensive treatment approach, their findings demonstrate the effects of music listening, either by contrasting it with alternative therapies or by examining its effect within a more comprehensive therapeutic framework.

Table 1

Flowchart of the data collection process



4.3 Data Extraction

The following section displays information extracted for the final 13 selected studies in table form and provides an overview of the articles. Table 2 shows the general information of the final studies, including the name(s) of the author(s), date of publication, and country of origin.

4.3.1 General overview of studies selected for the review

As mentioned above, Table 2 shows the selected studies' titles, authors (s) name (s), date of publication, and country of origin. The studies are arranged in alphabetical order by author(s). Of these 13 studies, 7 are quantitative, 3 are qualitative, and 3 are mixed-methodology. The United States of America and Italy were where the majority of the selected studies were conducted. Other studies were conducted in Turkey, Denmark, China and Croatia (Table 2).

Table 2

Studies selected for the review

Study No.	Title	Author(s) & Date	Country
1	Effects of Listening to Music on the Comfort of Chemotherapy Patients	Bilgiç & Acaroğlu, 2017	Turkey
2	Imagery, Metaphor, and Perceived Outcome in Six Cancer Survivors' Bonny Method of Guided Imagery and Music (BMGIM) Therapy	Bonde, 2007	Denmark
3	Effectiveness of music therapy for anxiety reduction in women with breast cancer in chemotherapy treatment	Bulfone et al., 2009	Italy
4	Differences between supportive music and imagery and music listening during outpatient chemotherapy and potential moderators of treatment effects	Burns et al., 2018	USA
5	Listening to music as part of treatment for breast cancer: A qualitative content analysis of patients' listening logs	Elwafi & Wheeler, 2016	USA
6	The effect of music and imagery to induce relaxation and reduce nausea and emesis in patients with cancer undergoing chemotherapy treatment	Gimeno, 2010	USA
7	Effect of Music Therapy on Chemotherapy Anticipatory Symptoms in Adolescents: A Mixed Methods Study	Giordano et al., 2024	Italy
8	A randomized control trial of meditation compared to music listening to improve cognitive function for breast cancer survivors: Feasibility and acceptability	Henneghan et al., 2020	USA
9	Mitigation of Chemotherapy-Induced Nausea Using Adjunct Music Listening: A Pilot Study	Kiernan & Vallerand, 2023	USA

10	Receptive music therapy versus group music therapy with breast cancer patients hospitalised for surgery	Lagattolla et al., 2023	Italy
11	Effects of passive music therapy on anxiety and vital signs in lung cancer patients undergoing peripherally inserted central catheter placement procedure	Mou et al., 2020	China
12	The Effect of Music on Anxiety, Pain Levels, and Physiological Parameters in Women Undergoing Brachytherapy: A Randomised Controlled Trial	Ünal et al., 2024	Turkey
13	The Effects of Music Listening on Pain Perception and Coping with Breast Cancer	Vilč et al., 2023	Croatia

4.3.2 Relevant information extracted from the studies

The following section presents Table 3, summarising data from the selected studies. Each study is organised by its title, including details on methodology and design, number of participants, data collection methods, research objectives, intervention design and procedures, and results and conclusions found in Table 3. Tables 4, 5, and 6 will present the quality checklists for all 13 selected studies. Lastly, Table 7 will outline the types of interventions, and Table 8 will provide an overview of the thematic analysis of the chosen studies' results.

Table 3

Summary of studies

Study No.	Methodology	Participants	Data Collection Method	Research Objectives	Intervention Design	Type of Intervention	Results & Conclusions
1	Quantitative Quasi-Experimental (Two-group pre-test and post-test)	N= 70 (18 years and older)	The data was collected through various ways such as Patient Monitor Forms, General Comfort Questionnaire (GCQ) and Edmonton Symptom Assessment System (ESAS). The forms were filled out during one-on-one interviews and telephone conversations.	The study aims to explore the impact of music listening on Turkish chemotherapy patients' comfort levels.	The intervention design is a quasi-experimental two-group pre-test and post-test (control and experimental groups).	The Turkish Psychological Association created a CD that consisted of a 30-minute relaxation track featuring violin, harp, and wave sounds. The researchers provided the patients with an MP3, which they were trained to use, adjusting the volume and switching it on and off. The patients were instructed to listen to the music for 15 to 30 minutes, 3 to 4 times per week, during chemotherapy. The patients needed to provide feedback after the chemotherapy session. Once discharged, the patients were given MP3 players to listen to music for between 20 and 30 minutes, no less than three days a week. On the patient observation form, the patients were asked to note the days and times that they first noticed symptoms and the times that they listened to music.	Patients who listened to music experienced an overall reduction in chemotherapy symptoms, such as pain, anxiety, emotional distress, nausea, and fatigue, while also improving their overall mood and relaxation compared to the control group. However, there was no significant difference in depression and shortness of breath between the two groups.

Study No.	Methodology	Participants	Data Collection Method	Research Objectives	Intervention Design	Type of Intervention	Results & Conclusions
2	Qualitative	N=6 (Only five completed)	The study focused on the perceptions and experiences of BMGIM therapy using semi-structured interviews with five individuals. Data was also collected through patients' self-reports. The therapist's notes and recordings of music-listening sessions were also collected and analysed.	The study aims to examine how cancer patients view their progress from the Bonny Method of Guided Imagery and Music (BMGIM) therapy and investigate how imagery, metaphor, and narrative evolve during the sessions' music-listening periods. It seeks to understand how survivors' imagery changes as a result of the BMGIM process and their therapy experiences.	For the intervention design, Participants underwent 10 BMGIM sessions, typically every two weeks, each lasting about two hours. The sessions followed a structured format: preliminary conversation, induction, music listening with imagery, and post-session integration.	Each session for the intervention procedure began with a preliminary conversation to set goals and identify the patient's energy. This was followed by induction for relaxation and their inner worlds. Participants listened to music (music programs or sequences of Western classical music) while imagining, with ongoing dialogue with the therapist. The session concluded with a post-session review where participants reflected on their experiences, which included creative drawing and verbal sharing, connecting the imagery to the session's focus and previous experience.	The results indicated positive outcomes for the participants. The participants shared that they felt more hopeful, improved their coping mechanisms, gained fresh insights into their past, present, and future, and felt better overall. These results highlight the therapeutic advantages of BMGIM in promoting personal development and emotional resilience.

Study No.	Methodology & Design	Participants	Data Collection Method	Research Objectives	Intervention Design	Intervention Procedure	Results & Conclusions
3	Quantitative Clinical Experimental Design (Randomised Control Group)	N=60 (30 MT group and 30 control group)	The data was collected through the Spielberg State-Trait Anxiety Inventory (STAI-Y) questionnaires, where anxiety levels were measured. The researcher collected this before and after the music therapy intervention (music listening).	The study aims to determine how music therapy affected the anxiety levels of individuals with breast cancer undergoing conventional medical care.	For the intervention design, the study used a randomised controlled trial design to assess the effect of music therapy on the anxiety levels of patients with breast cancer. Participants were randomly assigned to the intervention or control groups (30 participants per group). The intervention group received music therapy, whereas the control group did not before chemotherapy.	Participants were divided randomly into a control group and an intervention group. The intervention group received music therapy for 15 minutes before chemotherapy. This group listened to pre-recorded music with Walkman devices and earphones. The music includes new age, nature melodies, film soundtracks, Celtic melodies, and classical compositions. This procedure aimed to create a calming effect and reduce anxiety during the waiting period. The control group only received standard care and did not have music listening before their chemotherapy sessions. The procedure aims to identify the reduction in anxiety levels between the two groups.	The study's results showed that music listening aided in the reduction of anxiety, with a 9.9-point decrease in state anxiety scores ($P < .001$) for the experimental group. The control group showed an increase in anxiety levels. Therefore, music listening has been deemed effective in lowering anxiety levels in breast cancer patients. The study identifies that listening to music is also a noninvasive and cost-effective approach.

Study No.	Methodology & Design	Participants	Data Collection Method	Research Objectives	Intervention Design	Intervention Procedure	Results & Conclusions
4	Quantitative Randomised Controlled Trial	N=76 (completed the post-test measures)	Once researchers administered the pretest and post-test measures. Medical information was collected from the patient's medical charts. Data was collected immediately after the 45-minute session for the two groups.	The study aims to investigate how listening to preferred music vs supporting music and images affects the response to music, distress, anxiety, and depression, as well as benefit findings. The secondary aim of the study is to investigate the feeling of coherence and locus of control as putative predictors of intervention efficacy.	Cancer patients were assigned to one of two music interventions (supportive music and imagery group and preferred music listening group). Each group received a 50-minute session led by a music therapist during outpatient treatment. Measures were taken before and after the intervention.	Board-certified music therapists led both interventions in private chemotherapy rooms. The Supportive Music and Imagery sessions began with a 5-10 minute discussion of current issues, followed by a 1-2 minute transition into a comfortable position. The session's core involved 30-35 minutes of guided relaxation, breathing exercises, and visualisations with recorded music. Each session concluded with a 5-minute review. In the Preferred Music Listening sessions started with a 5-10 minute discussion of music preferences started, followed by a 1-2 minute playlist selection. Patients listened to their chosen music during the infusion for 30-35 minutes, ending with a 5-minute review.	The study's findings indicated that while the music-listening group reported less discomfort, the supportive music and imagery group responded better to music intervention and demonstrated more substantial benefits such as enhanced body awareness, improved decreased depression, increased emotional engagement and reduced intrusive thoughts. Furthermore, the results show that listening to preferred music and using images have distinct therapeutic effects, such as emotional regulation, relaxation, reduced anxiety and distress, decreased depression, enhanced self-awareness, and interpersonal connection. Lastly, listening to music evoked a narrower range of emotions compared to supportive music and imagery.

Study No.	Methodology & Design	Participants	Data Collection Method	Research Objectives	Intervention Design	Intervention Procedure	Results & Conclusions
5	Qualitative Qualitative content analysis	N=8	The data was collected through: ● Listening Logs ● Session Documentation ● CDS and Reactions ● Therapist feedback	This study aims to understand and explore the experience of women with breast cancer.	The study involved breast cancer patients choosing their preferred music to listen to twice daily for 30 minutes each session, with an exception on the first postoperative day when music was played only once in the evening. Music was delivered through headphones to provide a personal listening experience during the duration of the participant's hospital stay.	Individual sessions lasting 30 to 45 minutes, scheduled weekly or at longer intervals based on patients' treatment needs. Sessions began with discussions about the patient's current feelings and previous musical experiences, followed by interactive music-making with the therapist and sometimes family participation. Patients were given CDs of the session's music to listen to daily and kept listening logs to record their reactions. Data from these logs, including session details and patient responses, were collected to monitor the impact of the therapy. On average, patients listened to the CDs for 5 days, with usage ranging from 3 to 7 days.	The study identified ten critical themes from patient responses to music listening experience: Relaxation, Memories, Emotions, Spirituality, Beauty, Strength, Energy/Fatigue, Pain Relief, Family, and Physical Problems/Illness. Each theme was supported by patient examples highlighting the therapeutic benefits of the music.

Study No.	Methodology & Design	Participants	Data Collection Method	Research Objectives	Intervention Design	Intervention Procedure	Results & Conclusions
6	Mixed-Methodology Repeated Measures Experimental Design	N=20	Six data collection sessions were conducted for the research. Before and after each intervention session, participants' heart rates were monitored, nausea intensity assessed, vomiting documented, and antiemetic use checked. The study team called participants each evening to record vomiting, nausea, and CD usage, with instructions to self-record if unreachable. After the 3rd and 6th weeks, participants completed a Subject Satisfaction Survey. Nine days post-intervention, participants were interviewed about ongoing symptoms and demographic data were gathered from their charts.	The aim of this study was to examine how music combined with imagery, compared to imagery alone, helps to promote relaxation and reduce nausea and vomiting in cancer patients undergoing chemotherapy.	The study used a repeated measures design, where three outcomes were measured before and after each of the six intervention sessions. Participants received two types of treatments: music and imagery (MI) and imagery only (IO). These treatments alternated between sessions, with 10 participants starting with MI and 10 beginning with IO. The MI sessions combined music with verbal guidance to help participants create mental images for relaxation, while the IO sessions used only verbal guidance without music to achieve the same goal.	Each participant had one session per week over six weeks. The first session took place during chemotherapy infusion, with the remaining sessions continuing weekly, even if chemotherapy wasn't administered. Participants were encouraged to practice relaxation at home by listening to CD recordings twice daily. After the music and imagery (MI) session, they listened to a CD with both music and a relaxation script. After the imagery-only (IO) session, they listened to a CD with just a relaxation script. Each session lasted 60 to 90 minutes, including 30 minutes for preparation, 5 minutes for relaxation induction, 5 to 10 minutes of music and discussion, and 30 minutes for reflection.	Results showed a significant drop in heart rate after MI and IO interventions. Nausea and vomiting also decreased significantly over the 6 weeks of treatment. Participants reported that guided imagery with music, both during sessions and at home, was very effective in helping them relax. IO was statistically significant when compared to MI, and the control group reduced nausea. Both treatments similarly decreased emesis and heart rate, indicative of nonspecific relaxation. In general, IO was relatively more effective in diminishing nausea than emesis. Overall, both MI and IO reduced the heart rate.

Study No.	Methodology & Design	Participants	Data Collection Method	Research Objectives	Intervention Design	Intervention Procedure	Results & Conclusions
7	Mixed-Methodology	N=10	The data was collected using various methods (qualitative and quantitative): Heart Rate Variability (HRV): Data was collected 5 minutes before and 5 minutes after each music therapy session. Anxiety (SF-STAI1) and Anticipatory Nausea/Vomiting (AN-S and AV-S): Data were gathered 30 minutes before and after chemotherapy. Pediatric Quality of Life (PedsQL): Collected both before the intervention and at the end of the trial. Feasibility Assessment (Semi-structured interview): Conducted after the fourth music therapy session.	The study aims to explore the effects and feasibility of music therapy (GIM) on anticipatory vomiting and nausea, stress, pain and the quality of life in adolescents undergoing chemotherapy.	The intervention design would refer more broadly to the study's structure, such as the single-group, quasi-experimental, mixed methods pre-post design. The study used a receptive music therapy intervention, including relaxation exercises, personalised music listening, and post-session discussions, to reduce anxiety and improve well-being in patients undergoing chemotherapy.	The intervention procedure included four music therapy sessions with 13 participants who were hospitalised and undergoing chemotherapy at the Oncology and Hematology Unit in Bari, Italy. Sessions followed a structured procedure using an adapted version of the Bonny Method of Guided Imagery and Music (GIM), beginning with relaxation exercises and ending with guided music listening. Heart rate variability (HRV) was monitored, and anxiety, nausea, and quality of life were measured before and after the intervention.	The findings showed that this effective and feasible intervention of GIM showed a significant reduction in anxiety, nausea and vomiting (pre/post sessions) and improved quality of life for adolescents undergoing chemotherapy.

Study No.	Methodology & Design	Participants	Data Collection Method	Research Objectives	Intervention Design	Intervention Procedure	Results & Conclusions
8	Quantitative	N=31	Data collection was done through electronic surveys and cognitive tests before and after Kirtan Kriya meditation (KK) or music listening (ML) interventions.	The study aims to assess the practicality and impacts of Kirtan Kriya (KK) meditation on emotional symptoms in individuals who have survived breast cancer in comparison to listening to music.	Participants were in two groups (KK or ML group). Each group had its own instruction, and data was collected afterwards.	For eight weeks, participants engaged in their assigned daily practice for 12 minutes each day. The Kirtan Kriya (KK) group performed a meditation routine, which involved chanting, mudras, and visualisation. The Music Listening (ML) group listened to classical music selections by composers such as Mozart, Bach, and Beethoven. Each participant recorded their daily practice in a log.	Over time, both the KK and ML groups showed improvement on tests such as FACT Cog PCI and QOL, as well as HVLT I and COWA scores. The Perceived Stress Scale (PSS), which measures stress, showed lower ratings for the ML group. However, there were no significant differences between the groups in terms of any cognitive or affective outcomes, and the KK group did not show variances in their PSS scores.

Study No.	Methodology & Design	Participants	Data Collection Method	Research Objectives	Intervention Design	Intervention Procedure	Results & Conclusions
9	Mixed-Methodology Quasi-Experimental	N=12	Data were collected from 66 music-listening sessions over a 5-day period during which patients took their anti-nausea medication. The study used a pre-/post-test design to assess the impact of the music-listening intervention on chemotherapy-induced nausea (CIN), including measures of CIN severity and distress using a numeric rating scale (NRS). Additionally, feedback (such as open-ended questions) was gathered from participants regarding the feasibility and reception of the intervention, which was used to identify any issues and guide future improvements.	The study aims to investigate the effects of a music-listening intervention on reducing distress and nausea in patients experiencing chemotherapy-induced nausea (CIN) and to examine the relationship between CIN and an adjunct music-listening intervention.	Participants listened to their preferred music during chemotherapy. Pre-post assessment of distress and nausea will be recorded.	The 12 participants listened to their preferred music daily for 30 minutes (whilst taking antiemetic medication) in a 5-day music listening program that began two days after chemotherapy. Before and after each session, the distress and nausea levels of the participants were recorded. Furthermore, their feedback on the intervention was collected.	The study demonstrated that a 30-minute music-listening intervention was feasible and effectively reduced CIN severity and distress over five days, particularly in the delayed phase. Significant reductions were observed in both acute and delayed CIN phases.

Study No.	Methodology & Design	Participants	Data Collection Method	Research Objectives	Intervention Design	Intervention Procedure	Results & Conclusions
10	Quantitative	N=151	This study's data was collected from inpatients (n=151) with breast cancer. The data collection took place pre- and post-intervention, using two measuring tools, ET and STAI-Y1, to measure the psychological distress of the two groups: individual receptive music therapy and integrated group music therapy. Furthermore, a psycho-oncologist collected clinical and sociodemographic data from patient charts to evaluate the impact of the music therapy sessions.	The aim of the study was to assess the effects of a single music therapy session on psychological distress, such as anger, anxiety, distress, depression, and help-seeking in breast cancer patients who were based in the oncology ward in Italy. The study then further aimed to compare the outcomes of individual receptive music therapy (MTri) and interactive group music therapy (MTiGrp).	The 151 participants were randomly assigned to the two interventions (MTri) and MTiGrp). 48 MTri sessions and 25 MTiGrp sessions took place over the duration of the patient's hospital stay. Data was collected afterwards.	For MTri, a music therapist conducted a 60-minute RMT session. Patients could select three pre-recorded recordings, and the music therapist guided them into a relaxed state. Afterwards, this was accompanied by a live improvisation, and the patients provided verbal feedback. In MTriGrp, it was a 90-minute intervention co-led by a music therapist and a psycho-oncologist. This included receptive and active music making. The session was divided into two parts: free playing instrument (improvisation) and visualisation and music, choral singing and verbal reflections to the end of the session.	The MTri and MTiGrp interventions both showed emotional well-being improvements, such as decreased stress, anxiety, depression and anger in patients. However, MTiGrp reported a more significant reduction in stress and anxiety levels compared to MTri. Patients in the MTriGrp reported feeling more connected to and supported by their peers. At the same time, those in the MTri intervention recognised the advantages of introspection and calmness in helping them cope with the stress of surgery.

Study No.	Methodology & Design	Participants	Data Collection Method	Research Objectives	Intervention Design	Intervention Procedure	Results & Conclusions
11	Quantitative	N=300	The demographic data was collected on the day of admission, and the anxiety scores were measured before, during, and after PICC placement. Vital signs were recorded before and after the procedure. For the experimental group, passive music therapy was administered during catheterisation. Furthermore, the data were collected through face-to-face interviews by trained data collectors and analysed using Statistical Package for the Social Sciences (SPSS) version 19.0.	The aim of the study is to determine the effects of passive music therapy on anxiety and vital signs among lung cancer patients at their first peripherally inserted central catheter placement procedure in China.	The study was conducted at Sichuan University's West China Hospital's cancer centre using a randomised controlled trial with repeated measurements. Individuals with lung cancer who were above the age of eighteen and undergoing PICC catheter implantation were randomised to either the music therapy group or the control group. The experiment, which took place between May and December 2015, had 304 patients—152 in each group—and adhered to ethical criteria.	Patients in the experimental group received PICC implantation while receiving passive music therapy. They spent around 30 minutes using wireless headphones to listen to peaceful music that had been pre-selected. Standard care was given to the control group without any music. Before and after the procedure, the vital signs and anxiety levels of both groups were assessed, and data were gathered through in-person interviews and monitoring.	When compared to the control group, passive music therapy dramatically lowered both the vital signs of heart rate and systolic blood pressure after PICC implantation. According to the research's results, passive music therapy can reduce anxiety during invasive operations in a cost-effective, safe, and efficient manner.

Study No.	Methodology & Design	Participants	Data Collection Method	Research Objectives	Intervention Design	Intervention Procedure	Results & Conclusions
12	Quantitative Randomised Control Trial	N=55	Data was collected in several different ways. The researchers collected clinical and demographic data using a Descriptive Information Form. The Visual Analogue Scale (VAS) and Numeric Rating Scale (NRS) were used to quantify pain levels, while the Hospital Anxiety and Sadness Scale (HADS) was used to measure anxiety and sadness. Face-to-face observations, interviews, and participant comments in the music intervention and control groups were used to collect data.	The aim of the study was to examine the impact of music listening on anxiety, pain, and physiological indicators in women undergoing brachytherap y.	Participants were assigned to the music intervention or control group using the block randomisation procedure. This procedure aims to ensure that participants are distributed evenly between the two groups. The study's intervention method and outcome reporting were conducted with rigour and openness, adhering to Consolidated Standards of Reporting Trials (CONSORT) 2010 criteria.	Participants in the music intervention (passive music therapy) group underwent brachytherapy while listening to portable sound systems playing pentatonic tunes. Music was played throughout the process, including the application and treatment of the applicator. Before the surgery, baseline tests were completed, and physiological data were collected at regular 10, 20, and 30-minute intervals, ensuring a comprehensive understanding of the participant's physiological responses. HADC and VAS were used as post-procedure assessments, and subjects provided feedback on their experiences. The control group underwent the same procedure as the music intervention group but without the music.	The study identifies that 83.4% of participants found the music intervention helpful and significantly impactful in alleviating stress and promoting relaxation. However, the results show that it did not affect anxiety and physiological parameters such as temperature, pulse rate, systolic and diastolic blood pressure, oxygen saturation (SpO2), and respiratory rate. There was no significant difference in pain in the control and experimental groups. Since these results suggest that while music listening may not affect all physiological or emotional symptoms, its positive impact on stress could be beneficial for managing depression among patients undergoing cancer treatment.

Study No.	Methodology & Design	Participants	Data Collection Method	Research Objectives	Intervention Design	Intervention Procedure	Results & Conclusions
13	Qualitative	N=32	The data was collected through semi-structured interviews. These interviews were directed by predefined questions relevant to the research areas—music's role in everyday living and hospitalisation, its influence on pain perception, and changes in daily functioning. The interviews were between 25 to 30 minutes, with some at 45 minutes, and were carried out on the participant's last day of hospitalisation.	The aim of the study was to identify how music listening can be used as a way of determining what affects the experiences, pain perception, and daily functioning of breast cancer patients during the postoperative period. The study explored the potential to improve quality of life by reducing pain perception and enhancing physical, psychosocial, and behavioural outcomes.	The intervention design was as follows: First, issue areas, objectives, and research questions were identified. An informative booklet and a researcher-participant agreement were developed to acquire informed consent and assure ethical compliance. The researchers planned ways to capture observations, developed questions for semi-structured interviews, and organised the study. Prior to surgery, participants chose their preferred music, which was played twice daily for 30 minutes through headphones during hospitalisation, with the exception of the first postoperative day, with the option for longer listening. The participants listened to music while resting in bed.	The participants in the study chose their preferred music the day before surgery. During hospitalisation, music was played (by themselves) twice daily via headphones, 30 minutes of music listening in the morning and 30 minutes of music listening in the evening—except for the first postoperative day, when they only listened once for 30 minutes in the evening due to the surgical schedule. Participants could listen for longer if they wanted. The participants listened to music while resting in bed, and none showed any hesitation.	The study discovered that listening to music (specifically, clients' preference for music) significantly improved the lives of breast cancer patients, reducing their physical pain and improving their emotional states and daily hospital functioning. Music helped the patients shift their focus from discomfort to relaxation and joy, allowing them to cope with the diagnosis.

4.4 Quality

Two tools were used to evaluate the quality of the selected studies. The SURE (Supporting the Use of Research Evidence) appraisal quality checklist was used for the quantitative and qualitative studies, and the MMAT (Mixed Methods Appraisal Tool) appraisal checklist was used for the mixed-methodology studies.

4.4.1 Quantitative Studies

The systematic literature review included seven quantitative studies, most of which were randomised control trial (RCT) studies (3, 4, 8, 10, 11, and 12). The only paper not an RCT is study number 1, a quasi-experimental study. All seven studies addressed a clear focal question, the interventions were well described, ethical approval was obtained, the sample sizes were adequate, and participants were appropriately accounted for. Furthermore, all seven reported conflict of interest, but study 3 did not. The publication of the trial protocol could have been more precise in all seven studies. Table 4 below displays an overview of the SURE critical appraisal and how the quantitative studies were evaluated. Below, table 4 is coded through colours (red = no, yellow=unsure/unclear and green=yes).
The following questions will be answered in Table 4:

1. *Does the study address a clearly focused question/ hypothesis?*
2. *Was the population randomised?*
3. *Was allocation to intervention or comparator groups concealed?*
4. *Were participants/ investigators blinded to group allocation?*
5. *Were interventions well described and appropriate?*
6. *Was ethical approval sought and received?*
7. *Was a trial protocol published?*
8. *Were the groups similar at the start of the trial?*
9. *Was the sample size sufficient?*
10. *Were participants properly accounted for?*
11. *Are the statistical methods well described?*
12. *Results*
13. *Is any sponsorship/ conflict of interest reported*

<u>Table 4</u>

Quality appraisal for quantitative studies

	1	2	3	4	5	6	7	8	9	10	11	12	13
Bilgiç & Acaroğlu	Green	Red	Yellow	Red	Green	Green	Yellow	Green	Green	Green	Green	Green	Green
Bulfone et al.	Green	Green	Yellow	Red	Green	Green	Yellow	Green	Green	Green	Green	Green	Red
Burns et al.	Green	Green	Red	Red	Green	Green	Yellow	Green	Green	Green	Green	Green	Green
Henneghan et al.	Green	Green	Red	Yellow	Green	Green	Yellow	Green	Green	Green	Green	Green	Green
Lagattolla et al.	Green	Green	Yellow	Yellow	Green	Green	Yellow	Green	Green	Green	Green	Green	Green
Mou et al.	Green	Green	Green	Green	Green	Green	Yellow	Green	Green	Green	Green	Green	Green
Ünal et al.	Green	Green	Yellow	Yellow	Green	Green	Yellow	Green	Green	Green	Yellow	Green	Green

Colour Code: Red= no/not stated   Yellow=unsure/unclear   Green= yes

4.4.2 Qualitative Studies

Three qualitative studies (2, 5, and 13) met the inclusion criteria of this systematic literature review. In all three studies, the focus question was clear and concise, the choice of method was appropriate, and the sampling strategy was clearly described. Ethical issues and reporting on conflicts of interest were not discussed in any of the papers. Table 5 will demonstrate their credibility and quality. Below, Table 5 is coded through colours (red = no, yellow= unsure/unclear and green=yes).

The following questions will be answered in Table 5:

1. *Does the study address a clearly focused question/ hypothesis?*
2. *Is the choice of qualitative method appropriate?*
3. *Is the sampling strategy clearly described and justified?*
4. *Is the method of data collection well described?*
5. *Is the relationship between the researcher(s) and participants explored?*
6. *Are ethical issues explicitly discussed?*
7. *Is the data analysis/ interpretation process described and justified?*
8. *Are the findings credible?*
9. *Is any sponsorship/ conflicts of interest reported?*

<u>Table 5</u>

Quality appraisal for qualitative studies

	1	2	3	4	5	6	7	8	9
Bonde									
Elwafi & Wheeler									
Vilč et al.									

Colour Code: Red= no/not stated Yellow=unsure/unclear Green= yes

4.4.3 Mixed-Methodology Studies

Due to the quantitative methodology, sections of the studies are non-randomised. The MMAT has adjusted the questions to focus on screening, mixed-methodology, qualitative, and quantitative questions (with only randomised questions applicable to all three studies). The quality of most of these three studies (6, 7, and 9) is high. The only uncertainty question is whether confounders were sufficiently controlled for in the design and analysis. Below, table 6 is coded through colours (red = no, yellow= unsure/unclear and green=yes).

The following questions will be answered in Table 6:

Screening

1. *Are there clear research questions?*
2. *Do the collected data allow addressing the research questions?*

Mixed-Methodology

3. *Is there an adequate rationale for using a mixed methods design to address the research question?*
4. *Are the different components of the study effectively integrated to answer the research question?*
5. *Are the outputs of the integration of qualitative and quantitative components adequately interpreted?*
6. *Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?*
7. *Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?*

Qualitative

8. *Is the qualitative approach appropriate to answer the research question?*
9. *Are the qualitative data collection methods adequate to address the research question?*
10. *Are the findings adequately derived from the data?*
11. *Is the interpretation of results sufficiently substantiated by data?*
12. *Is there coherence between qualitative data sources, collection, analysis, and interpretation?*

Quantitative (non-randomised studies)

13. *Are the participants representative of the target population?*
14. *Are measurements appropriate regarding both the outcome and intervention (or exposure)?*
15. *Are there complete outcome data?*
16. *Are confounders accounted for in the design and analysis?*
17. *During the study period, is the intervention administered (or exposure occurred) as intended?*

Table 6

Quality appraisal for mixed-methodology studies

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Gimeno																	
Giordano et al.																	
Kiernan & Vallerand																	

Colour Code: Red= no/not stated Yellow=unsure/unclear Green= yes

4.5 Methodology

Most of the studies in the final selected studies were quantitative, followed by qualitative, mixed methodology studies. Six of the seven quantitative studies (3, 4, 8, 10, 11, and 12) used random control trials (RCT), while Study 1 used a quasi-experimental study. The three qualitative studies (2, 5, and 13) focused on semi-structured interviews and listening logs. Lastly, three mixed-methodology studies (6, 7 and 9) were selected in the final set of papers for the systematic literature review.

4.6 Participants

Across all the studies, 831 participants were involved. Of these, 398 were females, and 245 were males. In studies 1, 4, 7, and 13, the gender of the 188 remaining participants is either unspecified or undisclosed. Therefore, the data confirm a higher representation of female participants than male participants in the studies.

4.7 Data Collection Methods

The data collection methods varied across the selected studies. Out of the 13 studies, different data collection methods were used, such as questionnaires and surveys, interviews, medical data collected, observations, session lots and pre/post interventions. The selected studies used quantitative (Study 1, 3, 4, 8, 10, 11, and 12) and qualitative (Study 2, 5, and 13) approaches for data collection, and all of them employed a mixed-methods (Study 6, 7, and 9) design. Studies 1, 3, 4, 7, 8, 9, 20 and 12 all used questionnaires and surveys to collect their data. Semi-structured interviews or intervention-based approaches were utilised as data collection methods in studies 2, 6, 7, 11, and 13. Medical data, which was collected through clinical information from the participant's charts, looking at vital signs and medical history, was used in studies 4, 6, 10 and 12. Monitoring and observation of physiological measures (heart rate, vomiting, nausea levels) were data collection methods in studies 6,7 and 11. Studies 5, 6, 9 and 12 used session logs, feedback and documentation as data collection methods. Lastly, pre-/post-intervention data collection was used to assess the impact of chemotherapy-induced nausea, anxiety and distress levels, and physiological data were used in studies 6, 9, 10, and 12. As identified, there were also overlaps in the data collection methods.

4.8 Research Objectives

The 13 selected studies indicate distinct research objectives. However, they all share a similarity in investigating and exploring music listening interventions, such as Guided Imagery and Music (GIM), music listening, and receptive music therapy, specifically concerning cancer patients. Studies 1, 9, and 12 investigate the effects of music listening on cancer patients' comfort, discomfort, distress, and chemotherapy-induced nausea (CIN). In particular, Study 12 focused on the physical side effects of brachytherapy and implemented a music-listening approach to alleviate them. Additional studies, such as 2, 6, and 7, explored how participants' emotional and physical experiences could be integrated with music therapy, particularly receptive music and imagery. These studies address physical and emotional symptoms by combining music with imagery. In studies 3, 4, 10, and 11, the effects of receptive music therapy on psychological symptoms, such as anxiety, depression, and distress, were identified as the research objectives. These studies investigated how music therapy could reduce emotional distress and promote better psychological well-being in cancer patients. Lastly, studies 5, 8, and 13 research objectives explored cancer patients' broader emotional and psychological experiences, emphasising music's role in improving their emotional resilience and overall quality of life. In summary, the research objectives of all 13 studies highlight the diverse applications and experiences of music listening and receptive music therapy for cancer patients at various stages of treatment and across different types of cancer.

4.9 Intervention

The following table (Table 7) summarises the music-listening interventions employed in the selected studies. A brief description of each music-listening intervention is provided. The term "music listening" appears prominently in the type of intervention in the table, and the additional column to the right thoroughly describes this intervention.

Table 7

Type of interventions

No. of Study	Type of Intervention	Details
1	Music Listening	Listening to music for 20 to 30 minutes during chemotherapy via CD featuring violin, harp and wave sounds.
2	Guided Imagery and Music (GIM)	Each participant had a total of 10 individual GIM sessions, which were conducted every two weeks. Each session was approximately 2 hours. Western classical music was used in this intervention.
3	Music Listening	The intervention group listened to music (classical compositions, new age, Celtic melodies and nature sounds) via a Walkman device with headphones 15 minutes before chemotherapy sessions.
4	Supportive Music Imagery and Preferred Music Listening	Patients received 50-minute sessions where the Supportive Music and Imagery group used guided relaxation with recorded music (The music therapist selected pieces primarily from Western Art Music [Classical] and New Age genres), and the Preferred Music Listening group listened to their chosen music (Country, New Age, 2000s [the decade of], Christian, Jazz, 60s/70s, 80s/90s, Classical [Western Art Music], Broadway, and Spiritual) during infusion.
5	Music Listening	Patients were given CDs of the session's music to listen to daily and kept listening logs to record their reactions. Music genres used in the intervention include rock, soul, classic rock, folk, reggae, gospel, country, R&B, Motown, rap, pop rock, easy listening, instrumental jazz, blues, Celtic, show tunes, and acoustic rock.

6	Music and Imagery (MI) and Imagery (IO)	Each 60–90-minute session occurred over six weeks, with participants encouraged to practice relaxation techniques at home using CD recordings tailored to their session type. The music used primarily consisted of New Age music, characterised by slow tempi, repetitive musical themes, narrow melodic ranges, regular rhythms, and minimal instrumentation, with selections including nature sounds, guitar, flute, harp, piano, cello, and solo guitar.
7	Guided Imagery and Music (GIM)	Sessions followed a structured procedure using an adapted version of the Bonny Method of Guided Imagery and Music (GIM), beginning with relaxation exercises and ending with guided music listening. This was conducted over 8 months. Each participant had four sessions before chemotherapy treatment. The music used in this intervention included classical music from the Western tradition, pop, rock, new age, soundtracks, and light jazz, customised into playlists based on patients' preferences and specific musical elements.
8	Music Listening	The Music Listening (ML) group listened to classical music selections by composers such as Mozart, Bach, and Beethoven for 8 weeks and 12 minutes daily. Each participant recorded their daily practice in a log.
9	Music Listening	The 12 participants listened to their preferred music daily for 30 minutes (whilst taking antiemetic medication) in a 5-day music listening program that began two days after chemotherapy. The type of music was not discussed in the paper.
10	Receptive Music Therapy and Group Music Therapy	MTri (60 min) included relaxation, pre-recorded music, improvisation, and feedback, while MTiGrp (90 min) involved group improvisation, visualisation, singing, and reflection. The music chosen for the MTri group was designed to be soothing, featuring a predictable harmonic structure, a major key, and simple, repetitive elements, all without sudden dynamic shifts.

11	Music Listening	Patients spent around 30 minutes using wireless headphones to listen to peaceful music that had been pre-selected by patients. The music used in this study included classical, light, and folk genres, each chosen for their soothing melodies and pleasant rhythms, which are known to promote relaxation. The pieces featured a slow rhythm, low tones, and a tempo of 60–80 beats per minute, played at a controlled volume through wireless headphones. The patients listened to music during the entire catheterisation process, which lasted approximately 30 minutes.
12	Music Listening	Participants in the music intervention group listened to calming pentatonic tunes through portable sound systems throughout the brachytherapy process, including during the applicator's application and treatment.
13	Music Listening	Participants selected their preferred music (primarily local pop music) before surgery and listened to it via headphones twice daily during hospitalisation, with one 30-minute session on the first postoperative evening.

4.10 Results of the Studies

As detailed above, Table 3 summarises all 13 papers, including the results. This section will demonstrate how the five themes, i.e. symptom reduction, enhanced quality of life, intervention, cognitive benefits, and connectedness, were identified through a thematic analysis of the studies' respective findings. The results from the thirteen studies were coded in a separate document (Appendix A), with each code being assigned a code label corresponding to its study number as indicated in Table 8 (e.g., 1a, 1b, etc.). The codes were organised into the following categories: anxiety reduction, decreased depression, stress reduction, addressing physical symptoms, reflections on the intervention, improved emotional state, promotion of relaxation, improved quality of life, improved coping, cognitive benefits, spirituality, connectedness and gaining personal insight. The final step was to organise the categories into themes. Table 8 summarises the themes with their corresponding categories and codes.

Table 8

An overview of the thematic analysis of the selected studies' results

Theme 1	Categories	Codes
Symptoms Reduction	Anxiety Reduction	1b) Reduced anxiety 3a) Reduced anxiety 4f.3)Reduced anxiety 7b)Reduced anxiety 10c)Reduced anxiety 10g)Reduced anxiety (in MTiGrp) 11c)Reduced anxiety
	Decreased Depression	1h) No significant difference in depression 4c) Decreased depression 4f.5) Decreased depression 10d) Decreased depression
	Stress Reduction	8c) Lower PSS ratings for the ML group 8e) The KK group showed no variance in PSS scores 10b) Decreased stress 10f) Reduced stress in MTiGrp 12a) Reduced Stress
	Addressing Physical Symptoms	1a) Reduced chemotherapy-related pain 1d) Reduced Nausea 1e) Reduced Fatigue 1i) No significant difference in shortness of breath 4a) Reduced discomfort 4b) Improved body awareness 5h) Pain Relief 5g) Less Fatigue 6a) Reduced heart rate 6b) Decreased nausea and vomiting 6d) IO significantly reduces nausea vs MI, and the control group

		6e) Similar effects on emesis and heart rate 6g) IO is more effective for nausea than emesis 6h) No difference in emesis reduction between MI and IO 9b) Reduced CIN 11a) Lowered heart rate after PICC implantation 11b) Lowered systolic blood pressure after PICC implantation 13a) Reduced physical pain 13c.3) Improved physical condition (less discomfort)
Theme 2	**Category**	**Coding**
Benefits of music listening as a non-pharmacological intervention	Benefits of music listening as a non-pharmacological intervention	3b) Non-invasive 3c) Cost-effective 7a) Effective intervention 7e) Pre/post-session effectiveness 9a) Feasible intervention 11d) Cost-effective intervention 11e) Safe intervention 11f) Effective intervention
Theme 3	**Categories**	**Coding**
Coping and Enhanced Quality of Life	Improved Emotional State	1c) Reduced emotional distress 1f) Improved overall mood 2e) Enhanced emotional resilience 4f.1) Emotional regulation 4f.6) Enhanced self-awareness 10a) Improvements in emotional well-being 13b) Improved emotional states
	Promotes Relaxation	1g) Improved relaxation 4f.2) Increased relaxation 5a) Relaxation 6c) Guided imagery with music is effective for relaxation 10j) Benefits of calmness 12b) Promoted relaxation

		13e) Shifted focus from discomfort to relaxation
	Improved Quality of Life	7d) Improved quality of life 8f) Improvement in QOL scores
	Improved Coping	2b) Improved coping mechanisms 5f) Inspired Strength 13c.1) Improved Coping 13f) Helped patients cope with the diagnosis
Theme 4	**Category**	**Coding**
Cognitive Benefits	Cognitive Benefits	4e) Reduced intrusive thoughts 5b) Memories 8a) Improvement in cognitive (thinking and memory) abilities. 8b) Cognitive Improvement in Memory
Theme 5	**Categories**	**Coding**
Connectedness	Spirituality	2a) Increased feelings of hope 2f) Come to terms with life and death 5d) Spiritual Connectedness 5e) Reminder of Beauty
	Connectedness	5i) Promoted connectedness with family 10h) MTriGrp reported peer connection
	Gaining Personal Insights	2c) Gained insights into past, present, and future 2d) Improved self-understanding 10i) Benefits of introspection

4.11 Conclusion

This chapter accounts for the systematic literature review process. It provides a detailed summary of the thirteen selected studies and demonstrates the thematic analysis of their results. Chapter 5 discusses the study's findings in relation to the research questions and supporting literature.

Chapter 5: Discussion

This systematic literature review examined the role of music listening in cancer care. The findings (demonstrated in Chapter 4) highlighted its role across several broad themes, including symptom reduction, coping and enhanced quality of life, features of interventions, cognitive benefits, and connectedness. This chapter addresses the two research questions– 1)*What types of music-listening interventions are used in cancer care, according to the literature?* and 2) *What role does music listening play for individuals diagnosed with cancer, as reported in the literature?* These questions will be answered through the supported findings and other academic papers that can reinforce the analysis.

5.1 What types of music-listening interventions are used in cancer care, according to the literature?

The first question explores which types of music-listening interventions are used in cancer care. The findings in Table 7 show that various types of music-listening interventions were used in the reviewed literature, including: GIM, pre-recorded music listening (CD players), live music listening, music and imagery, receptive music therapy, and a combined group receptive music listening intervention. Given the identification of various types of music-listening interventions (Table 7), this exploration of the first research question seeks to further investigate these interventions by examining specific factors, including the duration of the interventions, the types of music employed, and the overall affordance of these interventions within the context of cancer care.

5.1.1 Duration of the interventions

As noted, some studies that referred to pre-recorded music listening had a music listening duration ranging from 12 to 30 minutes (Study 1, 3, 8, 9, 11 & 13). The music-listening interventions were implemented at different times according to the respective studies, e.g. before chemotherapy, during chemotherapy, during procedures or as part of a daily ritual (studies 1, 3, 4, 7, 8, 11, 12 & 13). Prior research establishes a standardised 30-minute duration for music listening interventions as both practical and consistent across various studies (Arruda et al., 2016; Bradt et al., 2015; Firmeza et al., 2017), a practice adopted in studies 1, 9, 11, 12 and 13. Notably, study 9 employed this 30-minute time frame for its intervention; however, it also highlighted that a shorter duration could have enhanced adherence and practicality, particularly for participants who were too unwell to complete the entire 30-minute session. In contrast to the 30-minute duration, in study 8, a participant cautioned the researchers not to make the intervention too long in the future, stating, "I can make 12 min happen." For participants, the intervention was delivered remotely, was easy to learn, was low-cost, and required minimal instructions. The 12-minute duration was highlighted as an essential factor, allowing the intervention to easily incorporate into participants' busy schedules (Henneghan et al., 2020). Notably, the interventions in the findings varied in duration; however, only Study 9 highlighted the possibility that a shorter duration benefited participants by improving completion rates. Similarly, a paper that attributes explicitly the effectiveness of reducing anxiety due to the duration is Study 11. Mou et al. (2020) stated that, generally, over time, anxiety would decrease after the procedure, but the music intervention accelerated and amplified anxiety reduction.

Studies 2, 4, 5, 6, 7, and 10 implemented interventions lasting between 30 minutes and 2 hours. The longer duration was due to the nature of the specific music interventions, such as Guided Imagery and Music (GIM), Preferred Music Listening (PML), Music and Imagery, and Receptive Music Therapy. Although many studies did not explicitly examine the duration of the interventions, the results show that longer sessions were still beneficial for cancer patients, with most participants completing them; however, some were unable to do so due to illness (Study 6). Gimeno (2010) emphasised that participants in fragile health may have had difficulties due to the significantly longer duration of the intervention, which might have resulted in incomplete sessions. This emphasises how crucial it is to adjust the length of an intervention to each patient's unique demands and physical state.

5.1.2 Genres of music used in the interventions

As demonstrated in the findings, various genres of music were used in the interventions. Western classical music was the most prominent, used in studies 2, 3, 7, and 8. In contrast, others used new-age music with calming qualities such as nature sounds, repetitive themes, and slow tempos (studies 3, 4, and 6). In study 11, pre-selected music was used, whereas in studies 4, 9 and 13, the preferred music of the participants/patients was used. In Bradt et al. (2015) paper, they discuss how the preferred or chosen music created comfort and familiarity, which created a safe holding environment. Comfort and increased relaxation were evident in studies 4 and 13 when patients/participants chose their preferred music. Furthermore, allowing the patients or participants to choose their music empowers them by maintaining their "locus of control". It ensures easy access to the music they enjoy, making it a practical option (Kiernan et al., 2023, p.288). Some papers have no explanation for why client/patient-preferred music was chosen. However, in Study 9, the rationale for self-selected music was rooted in its ability to promote emotional regulation and physiological responses, such as serotonin modulation (Evers & Suhr, 2000). This aligns with evidence suggesting that familiar and personally meaningful music enhances engagement and therapeutic outcomes due to its emotional and psychological significance (Helsing et al., 2016;

Martin et al., 2021). Martin et al. (2021) further explored the effect of self-selected music on emotional regulation. Their research suggested that listening to music chosen by the individual can positively influence emotions and stress levels. These results of decreased stress and increased relaxation were evident in studies 4, 9, 11 and 13. In particular, study 4 highlighted the benefits of patient/client-selected music through Preferred Music Listening (PML), an intervention where participants chose their music. This approach proved to be a simple and accessible strategy that effectively promoted relaxation and improved mood. While Study 4 highlighted the benefits of patient-selected music through Preferred Music Listening (PML), the study also revealed that it did not facilitate the deeper emotional processing and body awareness that the supervised and structured approach of Supportive Music and Imagery (SMI) provided (Burns et al., 2018). A participant who experienced a deeper insight who attended GIM stated, "Listening to the music, I experienced moods and emotions that were new to me. The experience [of myself and my world] was different—more intense" (Bonde, 2007, p.140). Many "deeper and more intense" experiences were linked to music listening and imagery (studies 2, 4, 6 & 7). Consistent with this, the supportive music and imagery group also reported greater benefit findings, further supporting previous research highlighting the advantages of music and imagery interventions (Archie et al., 2013).
The researchers did not always thoroughly explain the selection of specific music types, such as classical music. For example, in Study 2, no explanation was provided for selecting classical music; however, classical music used in BMGIM is rationalised. Bonny (2000) explains how classical music can evoke and facilitate deep emotional states and altered states of consciousness due to classical music composition. The music's dynamic contrasts, intricate structures and emotional depth resonate with the listeners, guiding them into their BMGIM experience. Hence, in studies 2 and 7, the choice or use of Western classical music was not specified but is an integral part of the BMGIM process. Another paper explored the type of music used in Study 12, specifically pentatonic music. The researcher chose this approach based on previous studies demonstrating the pentatonic scale's repetitive and simple melodic structure. This scale has been shown to have calming and soothing effects. This type of music helps distract patients from their pain and promotes relaxation (Ünal et al., 2024). It is evident that while some papers provided a rationalised justification for their choice of music, others did not. These findings highlight a range of potential advantages and disadvantages (for example, not a deeper experience) associated with selecting musical genres.

5.1.3 Benefits of music listening as a non-pharmacological intervention in cancer care

Table 7 provides a comprehensive overview of the music listening interventions employed in the selected studies analysed in this review. These included music listening interventions using patient-selected music, therapist-selected music, BMGIM, Music and Imagery, Supportive Music Imagery and Receptive Group

Music Therapy. The analysis also focused on how the interventions were reflected upon in some of the studies. As indicated in Table 8, music listening interventions are deemed to be a non-invasive, cost-effective, safe, and effective approach within the field of cancer care. This aligns with Lorek et al. (2023), who state that 'listening to music can be treated as a cheap, non-invasive' approach. Their findings reinforce the potential of music listening as an accessible and beneficial intervention in healthcare settings. Greenberg et al. (2010) also conveyed that balancing clinical effectiveness with economic sustainability in cancer care is of utmost importance. The authors further advocate for integrating cost-effective treatments that improve patient quality of life and outcomes while minimising the financial strain on healthcare systems. The benefit of having a non-pharmacological intervention that can holistically support patients demonstrates its potential to offer a comprehensive approach to supporting individuals in cancer care. A music listening intervention, for example, is considered a more holistic approach (Roberts et al., 2022), addressing patients' emotional, psychological, and physical well-being (Hinz et al., 2020; Beck et al., 2010; Daut & Cleeland, 1982; Hughes et al., 2024; Bergerot et al., 2022; Wiedenfeld et al., 1990).

5.2 What role does music listening play for individuals diagnosed with cancer, as reported in the literature?

The second research question focuses on identifying the role music listening plays for individuals diagnosed with cancer. While previous sections have discussed the intervention and types of music used, this section explicitly examines the impact of music listening on individuals diagnosed with cancer.

5.2.1 The role of music listening for symptom reduction

Several key themes emerged from the findings: symptom reduction, cognitive benefits, coping and enhanced quality of life, and connectedness. When considering the symptom reduction, the findings speak to a reduction in anxiety, decreased depression, and stress reduction and address physical symptoms. Notably, the findings showed a significant decrease in physical symptoms, particularly nausea, anxiety, and stress, for the individuals diagnosed with cancer (see Table 8). When analysing symptom reduction, nausea and vomiting emerged as a significant recurrence across several studies. According to Reuben and Mor (1986), nausea and vomiting were reported in 62% of terminal cancer patients. Commonly, in the case of nausea, patients are administered medication (a combination of a corticosteroid and a 5-hydroxytryptamine 3 [5-HT3] receptor antagonist) which aims to alleviate nausea and vomiting (Warr, 2008; Ryan, 2010). As seen in the findings, the music-listening interventions as a non-pharmacological approach have aided in the alleviation of nausea and vomiting. Music listening is not the only approach/intervention being considered; some medical practitioners are exploring alternative methods of alleviation nausea and vomiting. More holistic avenues have been investigated, including complementary and alternative medicine (CAM) practices. The most commonly used CAM interventions to control nausea and vomiting include acupressure, acupuncture, hypnotherapy, aromatherapy, and creative arts therapies (Ho et al., 2023). One of the creative arts therapies is music therapy, which is beneficial in reducing nausea and vomiting.

Hughes et al. (2024) identified anxiety as a primary emotional impact experienced by cancer patients. This could be due to the anxiety of receiving news of the diagnosis, the anxiety of uncertainty and the anxiety of the anticipation of the procedure (Mou et al., 2010). Ünal et al. (2024, p.7) shared that "music interventions [are] important in the treatment of psychological problems such as depression and anxiety experienced by many patients with cancer". Different facets of cancer treatment were examined by Mou et al. (2010), and Ünal et al. (2024), with both studies highlighting the prospect of non-pharmacological approaches to lowering anxiety.

Lastly, the papers' findings showed that stress was significantly evident in symptom reduction. As previously mentioned, Wiedenfeld et al. (1990) highlight that the diagnosis of cancer and the effects of living with cancer serve as significant stressors. Stress can be referred to as "the silent killer" on its own, but compound that with cancer, and its impact can be even more profound. That is why it is essential to address stress within cancer care. Studies such as 8, 10 and 12 demonstrated a reduction of stress for cancer patients through the various music-listening interventions. Henneghan et al. (2020) paper showed that music listening aided in a more significant stress reduction compared to the other group, which followed a Kirtan Kriya (KK) meditation intervention. The authors suggested that the possible reason for the further lowering of stress levels in the music listening interventions is due to it requiring less cognitive effort, which allows for more variety and is perceived as more enjoyable and accessible (Henneghan et al., 2020).

5.2.2 Cognitive Benefits of Music Listening

The findings indicated that cognitive benefits emerged as a recurring theme in several of the 13 selected papers. Specifically, improvements in memory and reduction of intrusive thoughts were highlighted. Study 5 specifically stated how music listening stirred meaningful memories. However, interestingly, in this study, a patient (number one) shared how the music brought back good and bad memories but also acted as a means to distract her from the reality she was facing. From the same study, a patient (number five) shared that "sometimes when it seemed that fatigue would rob me of all of my physical and

emotional strength, a song on one of the music therapy CDs (Aretha Franklin's 'Freeway of Love') would remind me of how much I have always loved to dance, and the music would energise my spirit and evoke memories of good times that chased away the dark mood" (Elwafi & Wheeler, 2016, p. 43). The role of music listening in these cases aided in the improvement of memory recall. McFerran and Lotter (2024, p.217) refer to music listening as an evocative stimulus which can elicit specific memories or associations and serve as a distraction.
Another notable cognitive benefit observed in Study 4 was the reduction of intrusive thoughts. This study highlights that participants in the supportive music and imagery group experienced fewer intrusive thoughts than those in the music listening group. Participants in the supportive music and imagery group reported that the experience helped them regulate their emotional state, contributing to the reduction of intrusive thoughts.

5.2.3 The role of music listening for coping and enhanced quality of life

According to the findings, enhanced emotional states, relaxation promotion, improved quality of life, and enhanced coping were the categories from the results that fall under the enhanced quality of life theme. For this discussion, I want to highlight the promoted relaxation and enhanced coping. What was interesting from the findings was the promotion of relaxation. Receiving a cancer diagnosis and living the journey that follows can result in individuals being worried and stressed. What was evident in most studies was the shift from a distressed and anxious state before music listening interventions to a calmer and more relaxed state afterwards (Studies 1, 4, 5, 6, 12 and 13). The importance of relaxation and the reduction of stress leads to psychological and physical improvements (Bradt et al., 2016). As mentioned, cancer patients benefit from relaxation, but accessing relaxation in a time of distress can be challenging. According to Study 6, relaxation is vital for lowering anxiety and the negative effects of chemotherapy. This study suggested that patients could receive a music and imagery programme in the convenience of their homes in the form of personalised audio recordings and instructions on continuing to practice relaxation techniques outside of a medical setting. This self-guided intervention promotes empowerment and coping skills to manage one's well-being and quality of life.

The findings of several papers indicate that music listening interventions can serve as tools to enhance coping mechanisms for patients. Schäfer et al. (2013) identified that music listening could be a potential coping strategy for managing specific symptoms associated with cancer. In Bonde's (2007) paper, all participants found the music-listening intervention to be a tool for coping. Bonde (2007, p.141) stated that "it [the music listening intervention] has provided the participants with a "tool" that can be used for emotional adjustment, introspection or self-exploration, supporting self-confidence, relaxation, and finding the courage to confront even difficult psychological issues”. Study 13 reinforces the idea that listening to music serves as a coping strategy, as participants in this study mentioned how the music made it easier for them to deal with the cancer diagnosis and allowed them to develop new coping mechanisms (Vilč et al., 2023).

5.2.4 The role of music listening for connectedness

Connectedness emerged as a theme with multiple articles in the study highlighting the various dimensions and variations of connectedness. The findings highlighted different forms of connectedness, namely intrapersonal (within oneself), interpersonal (with others) and transpersonal (spiritual) connectedness. Hughes et al. (2024) refer to isolation as being one impact of living with cancer., Wang et al. (2024, p.25) identified different “types and stages of disease and treatment that might result in isolation”.

Intrapersonally, individuals gained a more profound understanding and insight through the music-listening interventions (Studies 2 & 10). In Study 2, for example, listening to music provided participants with unexpected insights and enhanced their ability to confront difficulties in life, particularly those related to living with cancer. In terms of self-awareness, the music-listening intervention allowed participants to reflect and develop more practical and suitable methods and mindsets for their current circumstances. As noted, living with cancer is a complex and challenging experience. In a paper written by Kumar and Schapira (2013), a cancer patient shared how living with cancer sometimes makes one feel as if they are inhabiting someone else's body and how that experience can lead to a sense of losing control. The loss of power and sense of not being in your body speaks to the disconnection from oneself. This paper conveyed the significance of recognising the disconnect with oneself while living with cancer. Additionally, the findings of these various studies highlight connectedness on an interpersonal level.

Some patients' interpersonal relationships with their families were greatly enhanced by music (Study 5). According to Study 5, music played a significant role in participant four's relationships and connections, which had been fractured since their cancer diagnosis. However, when participant four’s husband attended a session (with the participant’s permission) and began playing his guitar, the participant shared how this musical experience brought them closer together again. In this case, listening to music created a connective bridge between the cancer participant and her loved one. As the literature shows, it is vital that a cancer patient has support and closeness from their family and loved ones to improve their well-being and quality of life (Vrontaras, 2018).

From a transpersonal level (spiritual), the role of music listening can cause individuals to experience a connection with a higher power (Studies 2 & 5). In study 5, a participant shared how the music stirred and energised their soul, and in that moment, that participant remembered that they were not fighting their cancer battle alone but with the Holy Spirit. In study 2, three participants shared how the music and the imagery created reassurance and empowerment within themselves. Music listening aided this individual in tapping into a deeper emotional and psychological state that words could not capture (Moss, 2019; Joseph, 2014; Bist et al., 2024). Sometimes, no living being on Earth can touch, connect with, or reach someone quite like a spiritual experience, and music can. Studies have shown that music and spirituality can reach individuals on a profound emotional level, offering comfort, connection, and meaning when other forms of support may be limited (Bradt & Dileo, 2014; Hilliard, 2005).

5.3 Implications for healthcare professionals

Insights gained from the review provide considerations for implementing and/or facilitating music listening intervention as a health care practitioner. To assist patients in making the most of music-listening interventions, Study 7 indicated that the role of the intervention health care provider (in this case, a music therapist) significantly enhanced the patient's experience. The patients reflected that the music therapist was very attuned, present, and responsive to their needs. Furthermore, the patients in this study expressed appreciation for this support, highlighting the therapist’s closeness, availability, and ability to create a safe and meaningful experience. This conveys that creating a secure and comfortable atmosphere is essential for healthcare practitioners in providing a music-listening intervention experience (studies 1 & 13). Some studies acknowledged that in terms of preferred music, a practitioner should recognise that even though that might not be their type of music, that is what the patient connects to and enjoys. Study 13 highlighted that even if the selected music does not align with the practitioner’s taste, it must still be acknowledged and accepted by the patient. The music chosen by the patient contributed to an enhanced therapeutic experience for patient-preferred music-listening interventions. Study 4 suggested that music therapists (healthcare providers) must be mindful of the emotional complexity of supportive music and imagery interventions, as they can evoke both positive and distressing emotions. It emphasised the importance of a healthcare provider monitoring patients’ emotional reactions and adapting the intervention to support their psychological needs.

Additionally, study 4 highlighted the necessity of tailoring the intervention to individual preferences, which enhances the music-listening experience for patients. Another important consideration for healthcare practitioners regarding the implementation of music listening interventions is the duration of the intervention. Providers must assess the optimal length of time a patient can effectively engage in the music listening intervention, considering the individual's health condition and capacity. Several studies have highlighted that shorter intervention durations may be more effective, particularly for patients with significant illness-related limitations (studies 8, 9 & 11). Some papers highlighted the role of music therapists as healthcare providers. However, there was a lack of research on other healthcare practitioners' implementation of music-listening interventions, which could be further explored.

Chapter 6: Conclusion

6.1 Introduction

This study aimed to conduct a systematic literature review examining the role of music listening in cancer care. The search strategy utilised the keywords “music listening”, “receptive music therapy”, and “cancer.” The initial search yielded 4383 papers, from which 13 met the inclusion criteria. Of these, seven employed quantitative methodologies, while five were qualitative. The analysis followed the PRISMA protocol, with a subsequent SURE quality appraisal to assess the rigour of the selected studies. The next phase involved summarising the papers, focusing on the research questions, the interventions examined, and the reported results. A thematic analysis was then conducted to identify key study patterns and findings. The results of this analysis revealed several emerging themes, which will be discussed in the following sections.

6.2 Summary of the Findings

Through close examination of the thirteen selected studies, the results of the study provide an overview of music listening interventions in a cancer care setting, which include: GIM, pre-recorded music listening (CD players), live music listening, music and imagery, receptive music therapy, and a combined group receptive music listening intervention. The thematic analysis of the findings of the thirteen studies yielded five themes: symptom reduction, coping and enhanced quality of life, the benefits of music listening as a non-pharmacological intervention, cognitive benefits, and connectedness.

6.3 Limitations

Many of the 13 selected studies shared similar limitations, such as a lack of control groups, small sample sizes, narrow populations and short intervention durations. In this section, I will highlight some of the limitations of the selected studies. Small sample numbers and lack of control groups were noted as limitations in Studies 2, 6, 7, 9 and 10. In particular, Studies 2, 6, and 11 demonstrated how the limited sample size impacted the findings' generalisability. Regarding the narrowed populations within some studies, they reported that the results with a specific cancer diagnosis restricted the findings' broader relevance and application (Study 5 and Study 8). Lastly, length was shown to be a common constraint in research in Studies 1, 2, 3, 4, 8, 11, 12, and 13. Many of these studies indicated in their limitations section that they would have liked additional time to conduct their research or examine the long-term effects, which still needed investigation.

6.4 Suggestions for Further Research

The 13 chosen studies have common recommendations for further research that address their limitations. A common suggestion for further research was to have more extensive and diverse sample sizes to provide more generalisable results (Studies 1, 3, 5, 6, 11, 12). Additionally, many studies advocate for the inclusion of control groups and using randomised controlled trials (RCTs) to strengthen the validity of findings (Studies 1, 3, 6, 7, 9, 10, 13). Regarding addressing the short intervention durations, studies 1, 2, 3, 4, 5, 6, 8 and 12 suggest a longer duration for the studies to aid in assessing sustained effects. Similarly, Studies 1, 3, 6, 10 and 11 recommended further research for long-term follow-up assessments to see outcomes such as anxiety levels and quality of life for participants. Studies 1, 7 and 13 suggested future research integrating preferred music and other therapeutic interventions to explore potential synergies.

6.5 Conclusion

In conclusion, this research paper underscores the promising role of music-listening interventions for cancer patients. While diverse, the various types of music listening interventions all emphasise the receptive music listening aspect in cancer care settings. As noted in the limitations, there is still a wealth of knowledge to be gained and explored in the realm of music listening in cancer care across diverse contexts. Specifically, future research could focus on age-specific interventions, context-specific experiences such as differences between private versus public healthcare settings or between South Africa and other countries, and practitioner-specific interventions and therapeutic processes. Exploring these areas could significantly enhance the effectiveness and applicability of music listening interventions in cancer care.

On a personal note, with family and loved ones who have experienced the overwhelming battle with cancer, I hope that this modest research paper can offer a ray of hope. It's a reminder that there are diverse ways to find solace and support during this journey. Music has always been my refuge, a place of comfort and self-discovery. For others, exploring music-listening interventions could open up a new, holistic approach to their cancer care journey, a perspective they might not have considered before.

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Appendices

Appendix A

Article No.	Outcomes	Codes
1	Patients who listened to music experienced an overall reduction in chemotherapy symptoms such as pain, anxiety, emotional distress, nausea, and fatigue, while also improving their overall mood and relaxation compared to the control group. However, there was no significant difference in depression and shortness of breath between the two groups.	1a) Reduced chemotherapy-related pain 1b) Reduced anxiety 1c) Reduced emotional distress 1d) Reduced nausea 1e) Reduced fatigue 1f) Improved overall mood 1g) Improved relaxation 1h) No significant difference in depression 1i) No significant difference in shortness of breath
2	The results indicated positive outcomes for the participants. The participants shared that they felt more hopeful, improved their coping mechanisms, gained fresh insights into their past, present, and future, and felt better overall. These results highlight the therapeutic advantages of BMGIM in promoting personal development and emotional resilience.	2a) Increased feelings of hope 2b) Improved coping mechanisms 2c) Gained insights into past, present, and future 2d) Promoted personal development 2e) Enhanced emotional resilience 2f) Come to terms with life and death
3	The results of the study showed that music listening aided in the reduction of anxiety, with a 9.9-point decrease in state anxiety scores (P < .001) for the experimental group. The control group showed an increase in anxiety levels. Therefore, music listening has been deemed effective in lowering anxiety levels in breast cancer patients. The study identifies that listening to music is additionally an approach that is non-invasive and	3a) Reduced anxiety 3b) Non-invasive 3c) Cost-effective

	cost-effective.	
4	The study's findings indicated that while the music-listening group reported less discomfort, the supportive music and imagery group responded better to music intervention and demonstrated more substantial benefits such as enhanced body awareness, decreased depression, increased emotional engagement and reduced intrusive thoughts. Furthermore, the results show that listening to preferred music and using images have distinct therapeutic effects, such as emotional regulation, relaxation, reduced anxiety and distress, decreased depression, enhanced self-awareness, and interpersonal connection. Lastly, listening to music evoked a narrower range of emotions compared to supportive music and imagery.	4a) Reduced discomfort 4b) Improved body awareness 4c) Decreased depression 4d) Increased emotional engagement 4e) Reduced intrusive thoughts 4f) Music listening preferred (client pre. promotes): 4f.1) Emotional regulation 4f.2) Increased relaxation 4f.3) Reduced anxiety 4f.4) Reduced distress 4f.5) Decreased depression 4f.6) Enhanced self-awareness 4f.7) Improved interpersonal connection 4g) Music listening only led to a narrower range of emotions
5	The study identified ten critical themes from patient responses to music listening experience: Relaxation, Memories, Emotions, Spirituality, Beauty, Strength, Energy/Fatigue, Pain Relief, Family, and Physical Problems/Illness. Each theme was supported by patient examples highlighting the therapeutic benefits of the music.	5a) Relaxation 5b) Memories 5c) Emotions 5d) Spirituality 5e) Beauty 5f) Strength 5g) Energy/Fatigue 5h) Pain Relief 5i) Family 5j) Physical Problems/Illness
6	Results showed a significant drop in heart rate after MI and IO interventions. Nausea and vomiting also decreased significantly over the 6 weeks of treatment. Participants reported that guided imagery with music, both during sessions and at	6a) Reduced heart rate 6b) Decreased nausea and vomiting 6c) Guided imagery with music effective for relaxation 6d) IO significantly reduces nausea vs. MI and control 6e) Similar effects on emesis and heart rate 6f) Nonspecific relaxation observed

	home, was very effective in helping them relax. IO was statistically significant when compared to MI, and the control group in reduced nausea. Both treatments similarly decreased emesis and heart rate, indicative of nonspecific relaxation. In general, IO was relatively more efficacious in diminishing nausea than emesis, while MI and. Overall, both MI and IO reduced the heart rate, whereas, for emesis, there was no difference between MI and IO.	6g) IO more effective for nausea than emesis 6h) No difference in emesis reduction between MI and IO
7	The findings showed that this effective and feasible intervention of GIM showed a significant reduction in anxiety, nausea and vomiting (pre/post sessions) and improved quality of life for adolescents undergoing chemotherapy.	7a) Effective intervention 7b) Reduced anxiety 7c) Decreased nausea and vomiting 7d) Improved quality of life 7e) Pre/post-session effectiveness
8	Over time, both the KK and ML groups showed improvement on tests such as FACT Cog PCI and QOL, as well as HVLT I and COWA scores. The Perceived Stress Scale (PSS), which measures stress, showed lower ratings for the ML group. However, there were no significant differences between the groups in terms of any cognitive or affective outcomes, and the KK group did not show variances in their PSS scores.	8a) Improvement, in FACT, Cog PCI scores 8b) Improvement in HVLT I and COWA scores 8c) Lower PSS ratings for the ML group 8d) No significant differences in cognitive or affective outcomes 8e) The KK group showed no variance in PSS scores 8f) Improvement in QOL scores
9	The study demonstrated that a 30-minute music-listening intervention was feasible and effectively reduced CIN severity and distress over five days, particularly in the delayed phase.	9a) Feasible intervention 9b) Reduced CIN

	Significant reductions were observed in both acute and delayed CIN phases.	
10	The MTri and MTiGrp interventions both showed emotional well-being improvements, such as decreased stress, anxiety, depression and anger in patients. However, MTiGrp reported a more significant reduction in stress and anxiety levels compared to MTri. Patients in the MTriGrp reported feeling more connected to and supported by their peers, while those in the MTri intervention recognised the advantages of introspection and calmness in helping them cope with the stress of surgery.	10a) Improvements in emotional well-being 10b) Decreased stress 10c) Reduced anxiety 10d) Decreased depression 10e) Decreased anger 10f) Reduced stress in MTiGrp 10g) Reduced anxiety in MTiGrp 10h) MTriGrp reported peer connection and support 10i) Benefits of introspection 10j) Benefits of calmness
11	When compared to the control group, passive music therapy dramatically lowered both the vital signs of heart rate and systolic blood pressure after PICC implantation. According to the research's results, passive music therapy can reduce anxiety during invasive operations in a cost-effective, safe, and efficient manner.	11a) Lowered heart rate after PICC implantation 11b) Lowered systolic blood pressure after PICC implantation 11c) Reduced anxiety 11d) Cost-effective intervention 11e) Safe intervention 11f) Effective intervention
12	The study identifies that 83.4% of participants found the music intervention helpful and significantly impactful in alleviating stress and promoting relaxation. However, the results show that it did not affect anxiety and physiological parameters such as temperature, pulse rate, systolic and diastolic blood pressure, oxygen saturation (SpO2), and respiratory rate.	12a) Reduced Stress 12b) Promoted relaxation

	There was no significant difference in pain in the control and experimental groups. Since these results suggest that while music listening may not affect all physiological or emotional symptoms, its positive impact on stress could be beneficial for managing depression among patients undergoing cancer treatment.	
13	The study discovered that breast cancer patients displayed significant improvements, such as reduced physical pain, improved emotional states and daily functioning at the hospital due to listening to music (specifically, clients' preference for music). Music helped the patients shift their focus from discomfort to relaxation and joy, allowing them to cope with the diagnosis.	13a) Reduced physical pain 13b) Improved emotional states 13c) Improved daily functioning at the hospital 13d) Positive impact of preferred music 13e) Shifted focus from discomfort to relaxation and joy 13f) Helped patients cope with the diagnosis