

MUSIC-BASED INTERVENTION OF EATING DISORDERS: A SCOPING REVIEW

Chen Lin*¹ and Indra V.Selvarajah²

^{1,2}Faculty of Human Ecology, University Putra Malaysia, Malaysia

Abstract

Objective: The objective of this scoping review is to explore the various types of music-based interventions utilized in the treatment of eating disorders, identify key characteristics of these interventions, and examine the methodologies and data collection techniques employed in the treatment process following diagnosis.

Introduction: The treatment of Eating Disorders (EDs) requires a multidisciplinary approach, and there is a growing body of evidence supporting the value of music-based interventions, such as music therapy and songwriting, in addressing the complex needs of individuals with eating disorders. However, little is known about this intervention more comprehensively. Given the diversity of participants, methodology, and data collection methods while dealing with different categories of eating disorders, it is necessary to explore the characteristics of MBI techniques as well as their theoretical approaches in order to offer better prospects with EDs.

Inclusion Criteria: The inclusion criteria of the paper are people of adolescent adults (female and male, excluding LGBT and trans-gender population) diagnosed with any eating disorders in inpatient and outpatient units. The intervention was used in music, especially any type of music activities delivered by musicians or researchers; those highlighting the qualification of a formal Registered Music Therapist (RMT) papers were also included.

Methods: We searched eight databases; the key information sources are EBSCOhost, Academic Search Complete, MEDLINE Complete, Psychology and Behavioral Sciences Collection, CINAHL Plus, and Cochrane Center Register of Controlled Trials. Using the population, concept, context (PCC) format in any language without time limitation. Following the JBI methodology and PRISMA-ScR checklist, 201 articles were identified for review. After duplicates were removed, two independent reviewers screened titles and abstracts and reviewed full-text articles. Sixteen articles were ultimately included in this scoping review. Two independent reviewers extracted data from 16 papers in this scoping review, resolving disagreements with the assistance of a third reviewer. Data coding was conducted using ATLAS.ti 23, and the results were exported to Excel for further analysis. The studies were reported and categorized into music therapy, music medicine, and other MBIs, each demonstrating diverse theoretical orientations in the forms of quantitative research, qualitative research, and mixed-method research according to PCC.

Results: The qualitative examination of the subject revealed four overarching themes: (1) the distinctive features of the participants involved; (2) the techniques and attributes of Music-Based Interventions (MBI) employed with Eating Disorders (EDs); (3) the theoretical orientation underpinning MBIs; and (4) a comprehensive exploration of the methodologies and data collection methods.

Conclusions: This scoping review offers crucial insights into the landscape of Music-Based

Interventions (MBI) with Eating Disorders (EDs). However, the key implications of these findings suggest that well-controlled studies are essential, as this will contribute significantly to a more robust understanding of the efficacy and underlying mechanisms of music-based interventions in the complex realm of eating disorders.

Keywords

Music-based intervention, eating disorders, music therapy, music medicine, music-based activities, anorexia nervosa, bulimia nervosa

Introduction

Eating disorders are complex mental health conditions characterized by disturbances in eating behaviors that can have significant physical and psychosocial consequences (Nagata & Golden, 2022). According to Qian et al. (2022), the lifetime prevalence of EDs globally was 3.6%. They include a range of disorders such as anorexia nervosa, bulimia nervosa, binge eating disorder, avoidant/restrictive food intake disorder, and other specific feeding and eating disorders (Nagata & Golden, 2022). Anorexia nervosa, bulimia nervosa, and binge eating disorder are recognized by the Diagnostic and Statistical Manual of Mental Disorders (DSM-5, 2013) as primary eating disorders. Anorexia nervosa is characterized by severe restriction of food intake, resulting in significantly low body weight, intense fear of gaining weight, and distorted body image (Bakalar et al., 2015). Bulimia nervosa involves recurrent episodes of binge eating followed by compensatory behaviors such as self-induced vomiting, excessive exercise, or the use of laxatives or diuretics (Bakalar et al., 2015). Binge eating disorder is characterized by recurrent episodes of binge eating without compensatory behaviors (Bakalar et al., 2015). However, it is important to note that there are other eating disorders that are not as well-known or recognized as the primary disorders. These are often referred to as "atypical" or "not otherwise specified" eating disorders (EDNOS) (Thomas et al., 2009). EDNOS encompasses a range of eating disturbances that do not meet the full criteria for anorexia nervosa, bulimia nervosa, or binge eating disorder (Thomas et al., 2009). It is estimated that up to 70% of individuals seeking treatment for an eating disorder fall into the EDNOS category (Thomas et al., 2009). In an updated version of DSM-5, EDNOS was not included in the diagnostic criteria; in this case, high-risk or at-risk of eating disorders population rose to our attention.

The onset and progression of an eating disorder typically occur gradually;; it can range from moderate to severe, from easily treatable to fatal, and from the early warning signals to the final diagnosis (Bryant et al., 2022). When an issue is found during screening, the ED diagnostic undergoes evaluation and diagnosis, which focuses on the area of concern (Berg et al., 2012).

Traditional treatment for eating disorders often involves a multidisciplinary approach, including psychotherapy, medical management, and nutritional counseling (Hill, 2016). The evidence-based psychological treatment methods in ED include Cognitive behavioral therapy for AN and BN (CBT-AN / CBT-BN), Maudsley anorexia nervosa treatment for adults (MANTRA) and Specialist supportive clinical management (SSCM). However, traditional approaches may not address the underlying psychological and emotional factors that contribute to eating disorders effectively. The complexity of these disorders requires a comprehensive and individualized approach (Froreich et al., 2016). Music-based intervention is an effective and process-oriented approach.

Music-based intervention (MBI) refers to the use of music as a therapeutic tool or approach to promote health and well-being in various populations. It involves the intentional use of music experiences and interactions to address specific goals and facilitate positive changes in individuals' physical, emotional, cognitive, or social functioning (Stegemann et al., 2019). In health care, Stegemann et al. (2019) summarized the types of music-based interventions, which are music medicine, music therapy, and other music-based interventions. Music-based interventions can take different forms and may include activities such as listening to music, singing, playing musical instruments, improvisation, songwriting, and movement to music. These interventions can be delivered by trained music therapists, musicians, or other healthcare professionals who incorporate music into their practice according to different types of MBI (Clare & Camic, 2019).

A preliminary search of MEDLINE, the Cochrane Database of Systematic Reviews, and JBI Evidence Synthesis was conducted and no current or ongoing scoping reviews on the topic were identified except for two systematic reviews related to MBI and ED. Testa et al. (2020) have summarized the benefits and risks factors of musical treatment approach. Chang et al. (2023) examined the therapeutic effects and it was targeted on its treatment results. These two systematic reviews is mainly addressed the meaningfulness and effectiveness of music-based treatment. To the best of our knowledge, there is no such a review identifying the MBI approaches with its characteristics itself. No scoping reviews has been studied and published.

Overall, the objectives of this research were to identify empirical evidence on what MBI techniques applied with people of eating disorders. The main outcome of this review was to build up features of networks in the context of intervention of eating disorders.

Review Question

The research questions aim to delve into the characteristics, techniques, theoretical underpinnings, methodologies, and challenges associated with Music-Based Interventions in the context of treating Eating Disorders, as identified in the scoping review.

1. What are the key characteristics of participants involved in Music-Based Interventions (MBI) for Eating Disorders (EDs), including demographic details and specific eating disorder diagnoses?
2. What types of Music-Based Interventions (MBI) have been applied in the treatment of Eating Disorders (EDs), and what are the distinctive features of these interventions?
3. What theoretical orientations underpin Music-Based Interventions (MBI) in the context of treating Eating Disorders (EDs), and how do these theoretical frameworks contribute to the understanding of the intervention's effectiveness?
4. How do the methodologies employed in research on Music-Based Interventions (MBI) for Eating Disorders (EDs) differ across studies, and what are the key data collection methods used to evaluate the impact of these interventions?
5. What specific challenges and opportunities exist in conducting well-controlled studies on Music-Based Interventions (MBI) for Eating Disorders (EDs), and how can future research address these issues to contribute to a more robust understanding of their efficacy and

underlying mechanisms?

Eligibility criteria

1. Studies involving people screened positive or diagnosed with any type of eating disorders, with any gender excluding LGBT and transgender age range from 18 to 65. Without limitations on inpatient and outpatient units.
2. Studies focused on MBI intervention in all stages, from at-risk of eating disorders to diagnosis of having type of eating disorders.
3. In order to investigate evidence-based research under this context, the research was focused on original studies, which are qualitative, quantitative, mix-method studies.

Participants

The population under investigation comprises adults aged 18-65 exhibiting early signs or diagnosed with any type of eating disorder, according to the criteria outlined in the DSM-5 (2013). Participants are drawn from both inpatient and outpatient units, excluding the LGBT and transgender populations.

Concept

The primary focus of this scoping review is on music-based interventions (MBI) applied in the context of eating disorders. This includes exploring the key characteristics of these interventions and understanding the methodologies and data collection methods employed in the treatment process after an eating disorder diagnosis.

Music-based interventions and music therapy are two distinct concepts within the field of healthcare. Music-based interventions encompass a broad range of protocols utilizing music, including passive or active participation, live or recorded music, and various methods such as singing and instrument playing (Clare & Camic, 2019). On the other hand, music therapy is a clinical and evidence-based profession that employs music interventions within a therapeutic relationship to address individualized goals delivered by credentialed professionals who have completed approved music therapy programs (Swanson et al., 2011). Furthermore, music therapy is distinguished from music medicine, where patients passively listen to recorded music under the guidance of medical staff (Nguyen et al., 2023). In contrast, music-based interventions, including music therapy, are used to address a variety of problems experienced by individuals across the developmental lifespan (Robb, 2000).

Context

The context of the review is set within the evidence-based utilization of MBI techniques and theoretical orientations with individual's features at risk of or diagnosed with eating disorders. The exploration encompasses diverse theoretical approaches within the realm of music therapy, songwriting, and other music activities. The review acknowledges the necessity to consider cultural and sub-cultural factors, geographic locations, and specific settings influencing the application of MBI techniques. Exclusion criteria based on specific contexts are not explicitly outlined but are implicitly considered in the focus

on formal Registered Music Therapists (RMT) and the exclusion of LGBT and transgender populations.

Types of Sources

This scoping review will consider both experimental and quasi-experimental study designs, including randomized controlled trials, non-randomized controlled trials, before and after studies and interrupted time-series studies. In addition, analytical observational studies including prospective and retrospective cohort studies, case-control studies and analytical cross-sectional studies will be considered for inclusion. This review will also consider descriptive observational study designs, including case series, individual case reports, and descriptive cross-sectional studies for inclusion.

Qualitative studies will also be considered that focus on qualitative data, including but not limited to, designs such as phenomenology, grounded theory, ethnography, qualitative description, action research and feminist research.

In addition, systematic reviews and grey literatures, including reports and opinion papers, will not be considered for inclusion in this scoping review. The reason was that grey literature, which includes reports and opinion papers, often lacks the same level of peer review and scrutiny as academic literature. Excluding grey literature ensures a more rigorous selection of evidence while still offering a comprehensive overview. Also, by excluding systematic reviews, we avoid duplicating efforts that have already been made in synthesizing primary studies.

Methods

This scoping review was conducted in accordance with the JBI methodology for scoping reviews (Peters et al., 2020). Peters MDJ, Godfrey C, McInerney P, Munn Z, Tricco AC, Khalil, H. Chapter 11: Scoping Reviews (2020 version). Aromataris E, Munn Z, editors. JBI Manual for Evidence Synthesis. JBI; 2020. Available from <https://synthesismanual.jbi.global>.

Search Strategy

The search strategy be aimed to locate published and unpublished papers and grey literature studies. We conducted a systematic search using a search engine from EBSCOhost of eight databases: Academic Search Complete, Psychology and Behavior Sciences Collection, SPORTDiscus with Full Text, CINAHL Plus with Full Text, Cochrane Methodology Register, and MEDLINE Complete. The search strategy, including all identified keywords and index terms, will be adapted for each included database and/or information source. The text words contained in the titles and abstracts of relevant articles, screening keywords on EBSCOhost were AB ("eating disorders" OR "anorexia" OR "anorexia nervosa" OR "bulimia" OR "bulimia nervosa" OR "binge eating" OR "binge eating disorder" OR "disordered eating") AND AB ("music" OR "music therapy" OR "music medicine" OR "music intervention"). Sixty-six papers were reviewed after duplicates were removed. We also conducted searching on Scopus with the keywords of TITLE-ABS-KEY ("eating disorders" OR "anorexia" OR "anorexia nervosa" OR "bulimia" OR "bulimia nervosa" OR "binge eating" OR "binge eating disorder" OR "disordered eating") AND TITLE-ABS-KEY ("music" OR "music therapy" OR "music medicine" OR "music intervention"). 279 papers were selected for review. The reference list of all

included sources of evidence will be screened for additional studies. Studies published on any date with any language were included for further screening. See Figure 1.

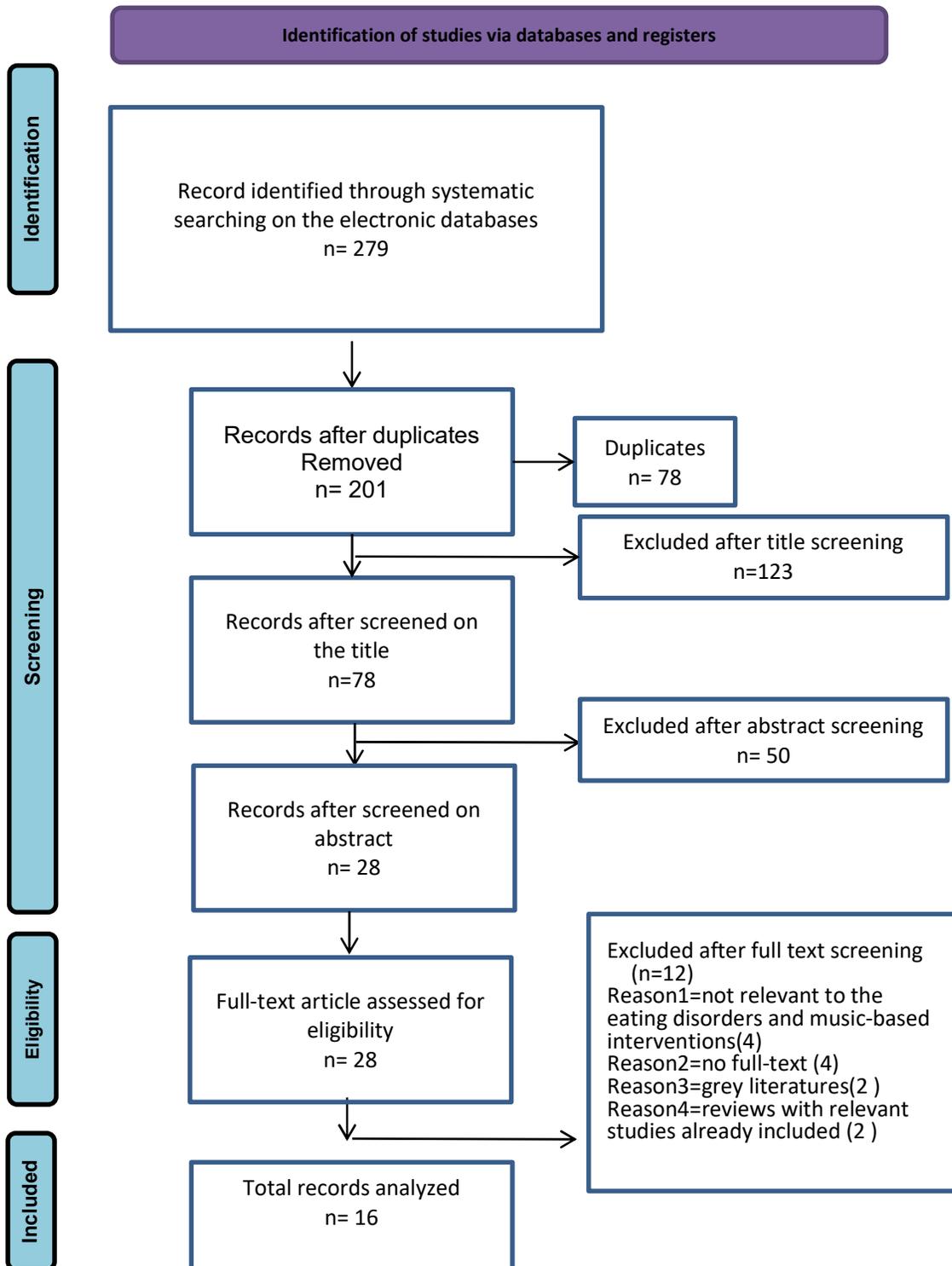


Figure 1. Inclusion and exclusion process in the scoping review.

Study/Source of Evidence Selection

Following the search, all identified citations were collated and uploaded into EndNote 20.6 (Clarivate Analytics), and duplicates were removed. After duplicates were removed by EndNote and Excel, 201 papers were left. Following a pilot test, titles and abstracts were then screened by two independent reviewers for assessment against the inclusion criteria for the review.

The full text of selected citations was assessed in detail against the inclusion criteria by two independent reviewers. Reasons for the exclusion of sources of evidence in the full text that do not meet the inclusion criteria were recorded and reported in the scoping review. Any disagreements that arise between the reviewers at each stage of the selection process were resolved through discussion or with an additional reviewer.

Data Extraction

Data was extracted from 16 papers included in this scoping review by two independent reviewers. Disagreements between the reviewers were resolved through an additional reviewer. We coded data by using ATLAS.ti 23 and export into Excel for further analysis. Codes included details about the authors, region, participant (i.e., gender, sample size, mean age, types of eating disorders), objectives, methodology and methods, method of data collection, methods of music-based intervention, frequency and duration of MBI, theoretical orientation of MBI, results and limitations.

Data Analysis and Presentation

Research Trend

Research trends in MBI with EDs can be partially reflected by analyzing word frequency, the year of publication, and the research region. First, the quantitative section generated the following word cloud based on the analysis of the source documents (Figure 2). As shown in Figure 2, the most famous words that appeared in the cloud were “music,” “therapy,” and “treatment,” indicating their high frequency in the article. As previously mentioned, this article focuses on Music-based Intervention (MBI) related to eating disorders, and we categorize MBI into music therapy, music medicine, and other MBI, categorizing the development of ED from early intervention to treatment after diagnosed. The word cloud shows the main themes in this topic, with the word “therapy” mentioned 781 times and “treatment” mentioned 395 times, “music + therapy” mentioned 2023 times.



Figure 3. Word cloud generated from 16 articles.

From the 16 articles, it is clear that the majority of the research was conducted in Australia ($n = 4$), North America ($n = 3$), the United Kingdom ($n = 3$), Italy ($n = 2$), Norway ($n = 2$), China ($n = 1$), and the United States of America (1).

The publications within the examined dataset span from 1992 to 2023, showcasing a notable shift in research focus over time. Approximately 63% of the publications fall within the most recent decade (2013-2023), indicating a significant surge in interest and attention toward Music-Based Interventions (MBI) for Eating Disorders during this period. In contrast, the remaining 37% of publications are distributed across the preceding two decades (1992-2012), underscoring the observable increase in scholarly activity and research engagement on this topic. This statistical distribution highlights a clear and growing trend in the attention given to the intersection of Music-Based Interventions and Eating Disorders over the years.

According to a review of published sources, journals in music-based intervention for eating disorders are on the rise. *Nordic Journal of Music Therapy and Appetite* are the top two choices for MBI researchers, as seen in Table 1. We can also see that the peak publication year was between 2003 and

2012. Since 2013, there has been a downward trend in research.

Table 1. Review based on journal

	1992-2002	2003-2012	2013-2023
<i>American journal of translational research</i>			1
<i>Appetite</i>			
<i>Australian Journal of Music Therapy</i>		1	1
<i>Brain Science</i>		1	
		1	
<i>Eating and weight disorders</i>		1	
<i>Eating disorders</i>		1	
<i>European Eating Disorders Review</i>		1	
<i>Frontiers in Psychiatry</i>			1
<i>Journal of Eating Disorders</i>		1	
<i>JOURNAL OF CREATIVITY IN MENTAL HEALTH</i>		1	
<i>Journal of Contemporary Psychotherapy</i>			
<i>Nordic Journal of Music Therapy</i>	1		
<i>The Arts in Psychotherapy</i>		3	1

Participants

Most studies explicitly focused on female participants in the context of eating disorders of anorexia nervosa. Three hundred participants, ranging from adolescents to adults (17-65), were investigated by the reviewed papers. The studies shared commonalities in their inclusion and exclusion criteria for participants in music-based interventions targeting eating disorders. An inclusion criterion often involved individuals diagnosed with AN, BN, BED, or unspecified eating disorders, with age ranges spanning adolescents to adults. Exclusion criteria were consistent across studies, encompassing cognitive impairment, language problems, and hearing impairment. Other shared exclusions included individuals with neurological diseases, mental impairment, learning disabilities, a history of drug use, psychotic disorders, and a history of head trauma. Some studies, such as Bibb, Castle, et al. (2016) and Valentina Cardi et al. (2015), excluded those with a lifetime diagnosis of mental illness or taking psychiatric medication.

Unfortunately, the specific percentage of male participants is not explicitly provided in the information provided. However, it is evident that the majority of the studies, as outlined, predominantly focused on female participants. Notably, studies like Ceccato and Roveran (2022) explicitly mention the inclusion of only female patients, while others, like Wang and Xiao (2021), include both male and female participants in the treatment group.

The studies presented a mix of participants in terms of treatment settings. For inpatients, Bibb, Newton, et al. (2016) focused on individuals aged between 18 and 65 who were receiving inpatient care. Frisch et al. (2006) investigated 22 inpatient cases with various eating disorders, including AN, BN, and BED.

Krishna Priya et al. (2021) included both inpatients with AN. On the other hand, for outpatients, Wang and Xiao (2021) specifically examined participants with AN in outpatient units. Krishna Priya et al. (2021) included participants with AN, encompassing both inpatient and outpatient settings in their study. These distinctions highlight the diversity in treatment settings across the reviewed studies.

Theoretical Orientation of MBI

Interventions such as music therapy and music medicine are applied under different theoretical orientations, mainly phenomenological, psychological, and philosophical fields of view, in which resources-oriented approach, body-oriented approach, patient-oriented approach, or CBT. This kind of intervention is usually led by a Registered Music Therapist (RMT). A resource-oriented approach, targeting the strengths and resources of participants to enhance the therapeutic impact of the interventions. Bibb, Newton, et al. (2016) conducted one-hour group music therapy. The focus was on stress and distress tolerance, with participants engaging in activities such as listening to songs, singing, and composing music. Similarly, in a parallel vein, patients were encouraged to actively participate by singing, listening to, selecting, and discussing familiar songs from a comprehensive songbook spanning multiple decades (Bibb et al., 2019). The therapeutic relationship of music is of vital importance in supporting the development and growth of the patient; this was emphasized by the patient-centered approach. The overarching goal of this was to normalize eating behavior and cultivate a regular eating experience. In the study conducted by Ceccato and Roveran (2022), a proficient Music Therapist guided group music therapy sessions. These sessions, spanning a comprehensive six-month period, were held daily for one hour during dinner time and incorporated both active and receptive music therapy activities. Utilizing diverse interventions such as instrument playing with Orff instruments, singing, and songwriting. Notably, improvisational activities with simple rhythmic structures in 4/4 timing were implemented. Additionally, the sessions incorporated receptive music listening for relaxation, with the therapist manipulating the volume to either facilitate relaxation or evoke emotional stimulation. A noteworthy inclusion in the therapeutic repertoire was the adoption of the musical psychodrama technique, leveraging music to actively engage and involve the participants in the therapeutic process. Trondalen (2003) used improvisation and music analysis, which focuses on musical and interpersonal levels of the interplay inspired by phenomenological approach. It means that the client's personal, biological, musical and clinical history is included in the musical therapy procedure. Also, the musical relationship and cultural codes between the client and therapist should be considered. Music analysis explored the implicit meaning, musical cues, and events. In the end, clients acquired self-listening experience. As for results, the interpersonal relationships developed between the therapist and AN patients; the clients acquired positive feelings, peace of mind, and emptiness. Trondalen (2003) argues that exploring musical structure and melody, as well as the development of rhythmic changes in improvisational composition, helps to establish a strong connection with them and explore the connection between the physical and the mental in patients with eating disorders. Trondalen and Skårderud (2007) used free musical improvisation followed by a verbal dialogue to explore the phenomenon of "affect attunement" to a 19 male with AN. The MT procedure was for the clients to choose instruments and play together with the music therapist to conclude the session with sentences at the end. Trondalen and Skårderud (2007) created music features analyzed by therapist; they were melodic shape, tempo changes in time, and pattern of pulsation in time and space.

MBI Technique

Both active and received MBI were facilitated to the participants in different stages, with receiving music therapy occurring in the initial phase. In active MBI, music as an intervention, improvisation in song lyrics generation, song melody composition, instruments, song lyrics discussion, and retheme structure were techniques most used by the therapist and the participants. In a three-stage music therapy study conducted by Lejonclou† and Trondalen (2009), improvisational activities such as melody composition and writing lyrics for Anorexia Nervosa (AN) and body listening for Bulimia Nervosa (BN) were incorporated, with instruments such as stomping, playing the drums and piano, leading to a verbal dialogue and the emergence of a calming melody. The clients wrote poems and songs, composed melodies, improvised, and sang together with the music therapist, and a variety of instruments, such as stomping, drumming, and piano playing, were applied (Lejonclou† & Trondalen, 2009). In a songwriting-focused music therapy intervention, McFerran et al. (2006) utilized a modified content analysis approach to investigate the thematic content and features of lyrics related to eating disorders (EDs). Using this technique, common motifs found in songs written by people with anorexia nervosa (AN) were identified. According to the survey, relationship dynamics, identity information, goals, and emotional awareness were the themes that appeared in the songs the most frequently. Studies on receive MBI focus on objectives such as generating relaxation, triggering emotional stimulation, and manipulating mood. This method focused on the participants' sensitivity to external stimuli, attempting to determine how these treatments may successfully produce the intended goals in terms of relaxation, emotional reactions, and mood regulation. In the study conducted by Valentina Cardi et al. (2015), they employed the reception of relaxing and uplifting background music. This particular musical method was intended to induce a positive mood in individuals with eating disorders. Valentina Cardi et al. (2013) used a music condition consisting of four pieces of modern classical music played for roughly 20 minutes in a receptive MBI. This method sought to investigate the effect of receptive engagement with the chosen musical stimuli on participants' psychological and physiological reactions. Wang and Xiao (2021) used music therapy, especially everyday music listening with pre-selected music from Chinese music background elements.

Music, as a therapeutic tool, can be applied to trigger specific types of emotion or mood. Compared with healthy participants, Spalatro et al. (2021) utilized common and preferred music as stimulation and found substantial changes in personality traits, general psychopathology, and emotional processing. Two meal-support studies employed music conditions as a comparison with vodcasts to examine the impact of vodcasts or as a part of vodcasts. The music intervention was combined with other forms, including images and scripts. The vodcast consisted of a short psych education video-clip, the music condition was pre-selected classical music, and the intervention was lasted for 20 minutes (Valentina Cardi et al., 2013). Valentina Cardi et al. (2015) found a significant correlation between improvements in mood and specific eating disorder symptoms after using “uplifting music” to induce positive mood. These findings suggest that music, being a stimulating medium, can serve as an efficient adjunctive treatment for psychological and emotional problems associated with a range of conditions, including eating disorders.

Frequency and duration of MBI

The duration and frequency of therapy sessions varied between studies. Lejonclou† and Trondalen

(2009) proposed a musical therapy strategy with weekly one-hour sessions separated into three parts. Similarly, Bibb, Newton, et al. (2016) took once a week over 13 weeks for 1 hour per session, and Bibb et al. (2019) undertook The Day Patient Program (DPP), held four days each week from 9:30 am to 3:30 pm for four-week block group music therapy sessions, the group attendance was 7 maximum. In a study conducted by Wang and Xiao (2021), a music treatment group was asked to listen to music every day that focused on emotional reactions, composed with a 2 hours CBT session (40 minutes break) for 12 weeks, that focused on psychological education. However, recognizing the need for more intensive and comprehensive therapy for eating disorders (EDs), Porter and Waisberg (1992) developed a five-week day treatment program that included dance, art, music, theater, and stress management instruction. Music was used to elicit emotions in their music-based approach, with exercises supporting the nonverbal investigation of emotional components associated with EDs. Within the therapeutic setting, the emphasis was on developing self-exploration, self-acceptance, emotional expressiveness, and general satisfaction. For music medicine studies, music as an induction of positive or negative emotions; in Valentina Cardi et al. (2013) study, four pieces of modern classical music were selected for background relaxation for about 20 minutes, and one “uplifting music” (Mozart’s Toy Symphony) for five minutes (Valentina Cardi et al., 2015). The study observed significant effects on food consumption, anxiety levels, and attention bias towards food following the induction of a positive mood in individuals with EDs.

Methodology and Methods

Almost a third of the studies were related to meal support for patients with AN. Two of them adopted mixed methods design where quantitative and qualitative data were collected within a quasi-experimental design, especially non-randomized pre-post design) followed by an interview (Bibb, Castle, et al., 2016; Bibb, Newton, et al., 2016). Individuals suffering from anorexia nervosa (AN) may face substantial difficulties and anxiety around meals. These challenges stem mostly from their overwhelming worry of gaining weight, which usually leads to an obsessive concern with feelings of guilt and a drive to participate in purging behaviors (Hage et al., 2015). Their aim was to investigate the experience and role of music therapy in reducing anxiety during supported post-meal times. Three studies implemented quantitative study with pre-post or repeated measures design (Bibb et al., 2019; Valentina Cardi et al., 2013; Ceccato & Roveran, 2022). Ceccato and Roveran (2022) investigated whether music therapy pre-meal is capable of reducing anxiety during dinner, while Bibb, Newton, et al. (2016) have demonstrated that MT session after lunchtime significantly lower post-meal anxiety inpatient and outpatient units of AN patient. From these studies, music therapy were adopted in reducing meal related anxiety among AN inpatient and outpatient.

Four qualitative studies focused on the application of music therapy in the context of Anorexia Nervosa (AN) and Bulimia Nervosa (BN), particularly within a psychodynamic framework in addressing psychological issues and promoting overall well-being. An intensive study of pre-and post-day treatment research design, including multiple programs, including music as a method of expressive therapies, was used to test the effect on the destructive societal values of AN patients. Porter and Waisberg (1992) aimed to employ a brief, intensive (day treatment) multidimensional approach, incorporating music therapy, with the goal of resolving psychological issues associated with eating disorders. Trondalen (2003) focused on promoting the experience of being connected in time and space through self-listening in music therapy for individuals with AN. McFerran et al. (2006) and Lejonclou†

and Trondalen (2009) centered around the use of a psychodynamic orientation. McFerran et al. (2006) aimed to utilize a psychodynamic framework to explore the expressive potential of lyrics generated by AN patients. By identifying characteristics in the lyrics related to emotion, identity, and interpersonal relationships, this objective contributes to a deeper understanding of the role of music therapy in facilitating self-expression and emotional exploration for those with AN.

The reviewed literature of quantitative research studies aimed at investigating the impact of various therapeutic interventions, with a predominant focus on expressive therapy, art therapy, skill-focused activities or fitness-recreation programs, music activity as a part of multi-forms of stimulation or treatment, MBI as part of the intervention. Porter and Waisberg (1992) conducted an intensive pre- and post-day treatment research design, utilizing multiple programs, including music as a method of expressive therapies, to assess their impact on the destructive societal values of AN patients. Valentina Cardi et al. (2015) explored the effects of induced positive mood vodcasts, specifically utilizing background music as a method of comparison against other modalities like vodcasts and images. Another noteworthy study by Spalatro et al. (2021) delved into the effects of music stimulation on EEG activity in AN patients compared to healthy participants. Frisch et al. (2006) adopted a survey research approach to investigate the prevalence and popularity of art-based therapy in North America for individuals with EDs. Krishna Priya et al. (2021) conducted a survey to examine the emotional and memory associations with music in individuals with Anorexia Nervosa (AN), aiming to determine whether these connections lean predominantly towards positive or negative experiences. In contrast, Wang and Xiao (2021) pursued a quantitative investigation into the combined efficacy of music and art therapy with Cognitive Behavioral Therapy (CBT), emphasizing the potential synergies between these therapeutic modalities for influencing emotional reactions and physical indices. Their research offers valuable insights into the development of comprehensive treatment approaches that extend beyond traditional interventions for individuals with eating disorders. These studies contribute valuable insights into the potential benefits of integrating such interventions into comprehensive treatment paradigms for individuals with EDs.

Method of data collection

Of all the data collection techniques used in the studies that were assessed, surveys and questionnaires were very common (n=11). The Eating Disorder Examination Questionnaire (EDE-Q) and its derivative, the Eating Disorder Examination Questionnaire 6.0 (EDE-Q-6.0), were the most commonly used scales because they provided thorough insights into the behaviors and attitudes associated with eating disorders. Furthermore, the Depression Anxiety Stress Scale (DASS) was a key element, offering a strong framework for evaluating psychological health on a variety of dimensions (Valentina Cardi et al., 2015; V. Cardi et al., 2013). Likert scales were utilized as a flexible instrument to assess the subjective experiences and perceptions of participants (V. Cardi et al., 2015). Moreover, Subjective Units of Distress Scale (SUDS) offered a quantitative of distress levels (Bibb, Newton, et al., 2016), The Beck Depression Inventory–II (BDI–II), The Symptom Checklist-90 (SCL-90) (Spalatro et al., 2021) provided a thorough measurement of psychopathological symptoms as well as standardized tests for assessing depression symptoms.

In the exploration of MBI-supported meal consumption in AN patients, V. Cardi et al. (2013) and Valentina Cardi et al. (2015) employed a comprehensive data collection approach that utilized multiple

methods. Such as questionnaire, E-prime task (i.e., response time, on-screen stimuli), memory tasks.

The primary methodology employed in these studies was a mixed-methods approach.

Another data collection method that was commonly used was Interviews (n=4). The qualitative information gathered from participant interviews demonstrated that music therapy served as a means of socialization, a distraction from the meal, and an interruption from worry (Bibb, Newton, et al., 2016). In another study, the interviews from participants shed light on various methods for applying MBI to ED treatment, highlighting the significance of customized, research-based care (Dvorak, 2023). See Figure 5.

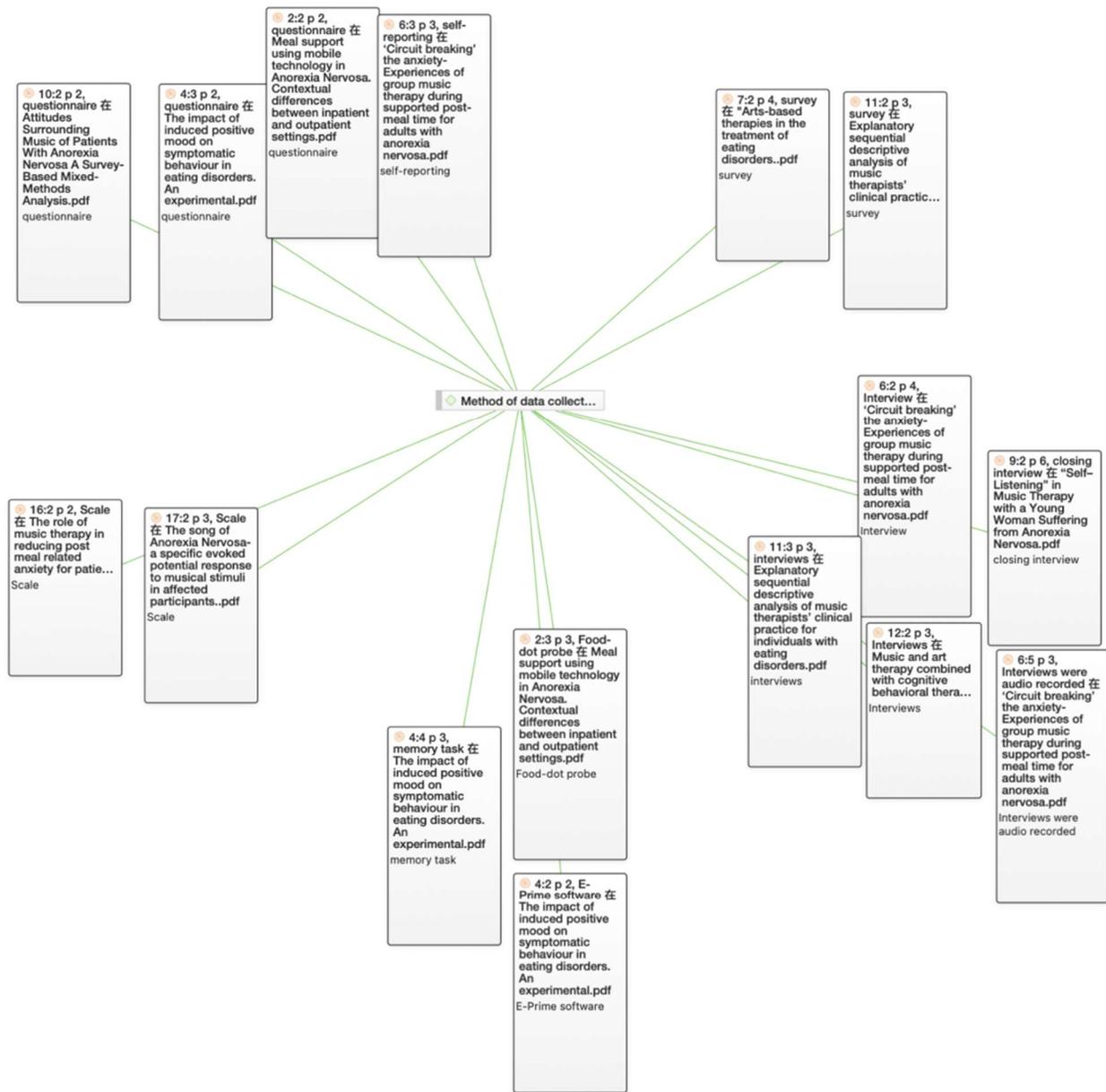


Figure 5. Data collection methods network.

Results

Music therapy has been found to offer motivation for recovery, a distraction from negative thoughts, and a sense of autonomy and creative expression for individuals with eating disorders (Bibb, Newton,

et al., 2016). From listening to recorded music to improvisation on lyrics, writing, composing melodies, improvising, and singing, participants self-reported that new self-confidence and positive feelings were acquired to the body (Lejonclouf & Trondalen, 2009). Furthermore, Research has examined the effects of music therapy and music-related activities, such as singing, songwriting, song-listening, and sharing, on AN, mealtime psychological burden, and physical sensations. Found that the potential of music therapy was to enhance emotional regulation, reduce anxiety, and promote self-expression, offering a unique avenue for therapeutic support for individuals with eating disorders (Bibb, 2021; Bibb, Castle, et al., 2016; Bibb et al., 2019; Ceccato & Roveran, 2022; Dvorak, 2023). Additionally, music therapy has been recognized as an integral part of the meal-support treatment program for individuals with anorexia nervosa; positive music or mood podcasts increased the amount of food consumed during mealtimes among AN patients, providing assistance while addressing the deeply-rooted problems commonly associated with these disorders (Valentina Cardi et al., 2015; Valentina Cardi et al., 2013)

Limitations

The limitations differ in the extent of their impact, with sample size and study duration being particularly critical, followed by issues related to long-term follow-up, generalizability, geographical diversity, and the lack of randomization and control groups. The investigation of MBI effectiveness stands out as a potential avenue for future research. Small sample size (Trondalen & Skårderud, 2007) (Wang & Xiao, 2021) (Spalatro et al., 2021) and insufficient duration of interventions during the treatment (Wang & Xiao, 2021) can impact the robustness and generalizability of study findings. Furthermore, lack of long-term follow-up assessment and observations (Porter & Waisberg, 1992) (Wang & Xiao, 2021) (V. Cardi et al., 2015; V. Cardi et al., 2013) which may hinder the comprehensive understanding of the sustained effects of interventions over time. In addition, Bibb et al. (2019) reported that participants were recruited from a single service, limiting the generalizability of the results to a broader population. Dvorak (2023) and Trondalen and Skårderud (2007) emphasized the need to consider global differences in the implementation of Music Therapy (MT) for eating disorders (EDs). Last but not least, Trondalen and Skårderud (2007) and Spalatro et al. (2021) lacked randomization (Randomized Controlled Trial - RCT) in their studies, introducing potential biases and no control groups were limited the ability to establish causation and assess the specific impact of interventions (Bibb et al., 2019) (Spalatro et al., 2021).

Conclusions

This scoping study offers information about Music-Based Interventions for Adolescents and Adults with Eating Disorders (EDs). The convergence of data from multiple researches emphasizes music therapy's promising potential as a beneficial supplementary treatment, particularly for people suffering from Anorexia Nervosa (AN). The variation in methodology, theoretical orientations, and intervention strategies demonstrates the versatility of music interventions in meeting the nuanced and personalized demands of this group.

However, it is crucial to acknowledge and address the limitations identified in previous studies. By overcoming these challenges, we can pave the way for more comprehensive and rigorously controlled research. This, in turn, will lead to a deeper understanding of the effectiveness and underlying mechanisms of music-based therapies in the context of eating disorders. Future research efforts should therefore focus on enhancing study methodologies, standardizing intervention protocols, and exploring

potential variations to provide a more nuanced understanding of how music therapy can best support individuals with eating disorders.

References

1. Bakalar, J. L., Shank, L. M., Vannucci, A., Radin, R. M., & Tanofsky-Kraff, M. (2015). Recent Advances in Developmental and Risk Factor Research on Eating Disorders. *Current Psychiatry Reports*. <https://doi.org/10.1007/s11920-015-0585-x>
2. Berg, K. C., Peterson, C. B., & Frazier, P. (2012). Assessment and Diagnosis of Eating Disorders: A Guide for Professional Counselors. *Journal of Counseling & Development*, 90(3), 262-269. <https://doi.org/https://doi.org/10.1002/j.1556-6676.2012.00033.x>
3. Bibb, J. (2021). The role of music therapy in Australian mental health services and the need for increased access to service users [Article]. *Australasian Psychiatry*, 29(4), 439-441. <https://doi.org/10.1177/1039856220980255>
4. Bibb, J., Castle, D., & Newton, R. (2016). 'Circuit breaking' the anxiety: Experiences of group music therapy during supported post-meal time for adults with anorexia nervosa. *Australian Journal of Music Therapy*, 27, 1-11. <https://search.ebscohost.com/login.aspx?direct=true&db=rzh&AN=121858140&site=ehost-live>
5. Bibb, J., Castle, D., & Skewes McFerran, K. (2019). Reducing Anxiety through Music Therapy at an Outpatient Eating Disorder Recovery Service. *Journal of Creativity in Mental Health*, 14(3), 306-314. <https://doi.org/10.1080/15401383.2019.1595804>
6. Bibb, J., Newton, R., & Castle, D. (2016). The role of music therapy in reducing post meal related anxiety for patients with anorexia nervosa [Article]. *Journal of eating disorders*, 4, 1-6. <https://doi.org/10.1186/s40337-015-0088-5>
7. Bryant, E., Spielman, K., Le, A., Marks, P., Touyz, S., & Maguire, S. (2022). Screening, assessment and diagnosis in the eating disorders: findings from a rapid review. *Journal of eating disorders*, 10(1), 78. <https://doi.org/10.1186/s40337-022-00597-8>
8. Cardi, V., Esposito, M., Clarke, A., Schifano, S., & Treasure, J. (2015). The impact of induced positive mood on symptomatic behaviour in eating disorders. An experimental, AB/BA crossover design testing a multimodal presentation during a test-meal. *Appetite*, 87, 192-198. <https://doi.org/10.1016/j.appet.2014.12.224>
9. Cardi, V., Lounes, N., Kan, C., & Treasure, J. (2013). Meal support using mobile technology in Anorexia Nervosa. Contextual differences between inpatient and outpatient settings. *Appetite*, 60(1), 33-39. <https://doi.org/10.1016/j.appet.2012.10.004>
10. Cardi, V., Lounes, N., Kan, C., & Treasure, J. (2013). Meal support using mobile technology in Anorexia Nervosa. Contextual differences between inpatient and outpatient settings [Article]. *Appetite*, 60, 33-39. <https://doi.org/10.1016/j.appet.2012.10.004>
11. Ceccato, E., & Roveran, C. (2022). Effects of Music Therapy in the Reduction of Pre-Meal Anxiety in Patients Suffering from Anorexia Nervosa [Article]. *Brain Sciences* (2076-3425), 12(6), 801-801. <https://doi.org/10.3390/brainsci12060801>
12. Chang, E. X., Brooker, J., Hiscock, R., & O'Callaghan, C. (2023). Music-based intervention impacts for people with eating disorders: A narrative synthesis systematic review [Article].

- Journal of music therapy, 60(2), 202-231. <https://doi.org/10.1093/jmt/thac018>
13. Clare, A. W., & Camic, P. M. (2019). Live and Recorded Group Music Interventions With Active Participation for People With Dementias: A Systematic Review. *Arts & Health*. <https://doi.org/10.1080/17533015.2019.1675732>
 14. Dvorak, A. (2023). Explanatory sequential descriptive analysis of music therapists' clinical practice for individuals with eating disorders [Article]. *Arts in Psychotherapy*, 85, N.PAG-N.PAG. <https://doi.org/10.1016/j.aip.2023.102067>
 15. Frisch, M. J., Franko, D. L., & Herzog, D. B. (2006). Arts-based therapies in the treatment of eating disorders. *Eating disorders*, 14(2), 131-142. <https://doi.org/10.1080/10640260500403857>
 16. Froreich, F. V., Vartanian, L. R., Grisham, J. R., & Touyz, S. (2016). Dimensions of Control and Their Relation to Disordered Eating Behaviours and Obsessive-Compulsive Symptoms. *Journal of eating disorders*. <https://doi.org/10.1186/s40337-016-0104-4>
 17. Hage, T. W., Rø, Ø., & Moen, A. (2015). “Time’s up” – staff’s management of mealtimes on inpatient eating disorder units. *Journal of eating disorders*, 3(1), 13. <https://doi.org/10.1186/s40337-015-0052-4>
 18. Hill, F. (2016). Family Therapy for Adolescent Eating and Weight Disorders: New Applications. *Advances in Eating Disorders*. <https://doi.org/10.1080/21662630.2016.1172914>
 19. Krishna Priya, A., Applewhite, B., Au, K., Oyeleye, O., Walton, E., Norton, C., Patsalos, O., Cardi, V., & Himmerich, H. (2021). Attitudes Surrounding Music of Patients With Anorexia Nervosa: A Survey-Based Mixed-Methods Analysis. *Frontiers in Psychiatry*, 12, 639202. <https://doi.org/10.3389/fpsy.2021.639202>
 20. Lejonclouf, A., & Trondalen, G. (2009). “I’ve started to move into my own body”: Music therapy with women suffering from eating disorders. *Nordic Journal of Music Therapy*, 18, 79-92. <https://doi.org/10.1080/08098130802610924>
 21. McFerran, K., Baker, F., Patton, G. C., & Sawyer, S. M. (2006). A Retrospective lyrical analysis of songs written by adolescents with anorexia nervosa. *European Eating Disorders Review*, 14(6), 397-403. <https://doi.org/https://doi.org/10.1002/erv.746>
 22. Nagata, J. M., & Golden, N. H. (2022). New US Preventive Services Task Force Recommendations on Screening for Eating Disorders. *Jama Internal Medicine*. <https://doi.org/10.1001/jamainternmed.2022.0121>
 23. Nguyen, K. T., Vu, N. T. H., Tran, M. T. T., & Chan, C. W. H. (2023). A Qualitative Study on Stress, Coping Strategies and Feasibility of Music Intervention among Women With Cancer Receiving Chemotherapy During COVID-19 Pandemic in Vietnam. *Scientific Reports*. <https://doi.org/10.1038/s41598-023-27654-9>
 24. Porter, J., & Waisberg, J. (1992). Overcoming destructive societal values in the treatment of anorexia nervosa: An intensive day treatment model. *Journal of Contemporary Psychotherapy: On the Cutting Edge of Modern Developments in Psychotherapy*, 22, 77-88. <https://doi.org/10.1007/BF00945996>
 25. Qian, J., Wu, Y., Liu, F., Zhu, Y., Jin, H., Zhang, H., Wan, Y., Li, C., & Yu, D. (2022). An update on the prevalence of eating disorders in the general population: a systematic review and meta-analysis. *Eat Weight Disorder*, 27(2), 415-428. <https://doi.org/10.1007/s40519-021->

01162-z

26. Robb, S. L. (2000). The effect of therapeutic music interventions on the behavior of hospitalized children in isolation: developing a contextual support model of music therapy. *J Music Ther*, 37(2), 118-146. <https://doi.org/10.1093/jmt/37.2.118>
27. Spalatro, A. V., Marzolla, M., Vighetti, S., Daga, G. A., Fassino, S., Vitiello, B., & Amianto, F. (2021). The song of Anorexia Nervosa: a specific evoked potential response to musical stimuli in affected participants. *Eating and weight disorders: EWD*, 26(3), 807-816. <https://doi.org/10.1007/s40519-020-00898-4>
28. Stegemann, T., Geretsegger, M., Phan Quoc, E., Riedl, H., & Smetana, M. (2019). Music Therapy and Other Music-Based Interventions in Pediatric Health Care: An Overview. *Medicines*, 6(1), 25. <https://www.mdpi.com/2305-6320/6/1/25>
29. Swanson, S. A., Crow, S. J., Le Grange, D., Swendsen, J., & Merikangas, K. R. (2011). Prevalence and correlates of eating disorders in adolescents. Results from the national comorbidity survey replication adolescent supplement. *Arch Gen Psychiatry*, 68(7), 714-723. <https://doi.org/10.1001/archgenpsychiatry.2011.22>
30. Testa, F., Arunachalam, S., Heiderscheit, A., & Himmerich, H. (2020). A Systematic Review of Scientific Studies on the Effects of Music in People with or at Risk for Eating Disorders. *Psychiatr Danub*, 32(3-4), 334-345. <https://doi.org/10.24869/psyd.2020.334>
31. Trondalen, G. (2003). "Self-listening" in music therapy with a young woman suffering from anorexia nervosa. *Nordic Journal of Music Therapy*, 12(1), 3-17. <https://doi.org/10.1080/08098130309478069>
32. Trondalen, G., & Skårderud, F. (2007). Playing with affects: And the importance of "affect attunement". *Nordic Journal of Music Therapy*, 16(2), 100-111. <https://doi.org/10.1080/08098130709478180>
33. Wang, C., & Xiao, R. (2021). Music and art therapy combined with cognitive behavioral therapy to treat adolescent anorexia patients. *American journal of translational research*, 13(6), 6534-6542. <https://search.ebscohost.com/login.aspx?direct=true&db=mdc&AN=34306394&site=ehost-live>