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MUSIC THERAPY FOR DEPRESSION, ANXIETY AND WORK-RELATED STRESS AND BURNOUT: A NARRATIVE REVIEW

ABSTRACT

Introduction: According to previous research and reviews, music therapy has been found to be an effective and motivating way of treating mental health disorders. Research has been conducted especially related to depression. This narrative review aims to provide an updated view of music therapy in treatment of depression, and closely related disorders, anxiety and exhaustion among working-age individuals. **Methods:** Literature included randomized controlled trials, pilot and feasibility studies, case studies, process studies and case reports, in which music therapy had been used for treating either depression, anxiety or exhaustion among working-age populations. Of all screened articles (1748) a total of 23 studies were included in the review. Additionally, three more articles were presented in the results to enrich the view of this subject, even though they did not fully meet the inclusion criteria. **Results:** The search offered a versatile and rich view to the use of music therapy in treatment of working-age population with depression, anxiety and work-related stress. The studies mainly focused on decreasing depression and depressive symptoms, but improving anxiety, stress, self-esteem and emotion regulation were also the focus of many included studies. Improvisation, music listening in some form and songwriting were among the most used music therapy methods. Mainly quantitative but also qualitative and mixed research methods were found. **Discussion:** The reporting of music therapy research seems to have improved during recent years, for example, in terms of the quality of intervention descriptions. Multiple clinical methods were utilized in different therapy settings, and clinical improvisation seemed to be one very common and effective approach, allowing new modalities for emotion expression and self-exploration. The intensity of therapy seemed to affect the treatment outcomes.

KEYWORDS: MUSIC THERAPY, DEPRESSION, ANXIETY, EXHAUSTION, BURNOUT, NARRATIVE REVIEW

INTRODUCTION

Mental health problems affect tens of millions of Europeans. They cause a heavy burden for individuals and also for society as a whole (1). In Finland mental health issues are the most common reason for extended sick leave (2). Depression is the biggest reason for disability pension and the most common cause for receiving sickness allowances (3). The number of different anxiety disorders has also grown (4), often comorbid with depression (5), and the prevalence of burnout symptoms has increased significantly during the past five years (6). Employment status, income, physical health, experiences during childhood and adolescence among other social, economic and

cultural factors impact on our mental health significantly through our lifespan. However, mental wellbeing can also be promoted and mental ill-health prevented in many ways (7). According to Finnish Current Care Guidelines (CCG) (8,9), both depression and anxiety disorders are usually treated with psychotherapy, antidepressants or both. Currently there is no CCG for burnout since it is not recognized as a diagnosis. This can have an effect in detecting the actual problem and in organizing the needed support and treatment for burnout and exhaustion.

Music therapy (MT) is clinical and evidence-based use of different music interventions aimed at accomplishing individualized goals within a therapeutic relationship conducted by a professional music therapist (10). MT can be offered as

an independent therapeutic process or added to standard care. According to Finnish CCG (11), MT is a suitable form of treatment and rehabilitation for children, adolescents, adults and older adults with different psychological or neurological disorders or limitations in general functioning. CCG state that MT can be used as a therapeutic tool, especially for children and adolescents with autism spectrum disorder (ASD). MT is also mentioned in the CCG for dementia, developmental language disorders (DLD) and schizophrenia (12). The Social Insurance Institution of Finland, Kela, reimburses MT as intensive medical rehabilitation (13) and as rehabilitative psychotherapy. Rehabilitative psychotherapy is reimbursed only for adolescents and young adults aged 16–25, based on psychiatrist's statement, if their ability to work is impaired by a mental health disorder (14). There is, however, a lot of research-based evidence to support the more extensive use of MT in treatment of adults with depression-related disorders.

Psychotherapy in its original and traditional practice is essentially a verbal experience, whereas music psychotherapy is defined by the use of music experiences together with or instead of verbal discussion (15). Music in MT can provide non-verbal means of communication and self-expression and serve as a bridge between verbal and non-verbal modes of communication (16). The role and emphasis given to music and music experiences in a therapeutic process can vary a lot. According to Bruscia (15) there are four levels of music engagement used in music psychotherapy, and the difference between these levels is how the role of music is considered and how the therapeutic issue is accessed, worked and resolved. In 1) *Music as psychotherapy*, this happens through music listening and creation with no need for verbal discussion. In 2) *Music-centred psychotherapy*, music is used similarly, but the additional verbal discussion is used to guide, interpret or enhance the music experience and its relevance to the therapeutic process and the client. In 3) *Music in psychotherapy*, the therapeutic issue is processed through both musical and verbal experiences. Music is used for its specific and unique qualities and considered as essential to the current issue and its treatment. And finally in 4) *Verbal psychotherapy with music*, music is considered as an enriching or facilitating component but not essential in terms of the therapeutic issue and its treatment. The therapeutic issue is accessed, worked and resolved primarily through verbal discussion.

Bruscia (16) originally defined four main MT methods or types of music experience that are used for assessment, treatment and evaluation. These methods are improvising, recreating, composing and listening. In this article we refer to the first three methods as active MT methods since the client

or participant is actively engaging in music creation in one way or another. In practice these can be techniques such as musical improvisation, songwriting, playing an instrument or singing. Music therapists may use these techniques with any kind of instrument including their own voices (17). The fourth method we refer to here as receptive MT methods since they are based on the use of pre-composed music. These methods include, for instance, music relaxation, imaginal listening, music and imagery, song (lyric) discussion, song reminiscence or listening to client's favourite music (18). The music experience can be either objective, subjective, energetic, aesthetic, collective or transpersonal (16).

MT has been used with many kinds of client groups and there are several reviews conducted in the field of MT related to different disorders (19–21), including neurological and psychological ones. Concerning MT and depression, Aalbers et al. (21) conducted a systematic review that thoroughly assessed the effects of MT in this area. Their findings suggest that MT improves symptoms of depression when added to treatment as usual (TAU) compared to TAU alone, thus providing short-term beneficial effects for people with depression. According to the authors, MT can also be beneficial for anxiety and improve the level of functioning of depressed individuals. In addition, MT added to TAU was not associated with more or fewer adverse events than TAU alone. Authors state that relatively little research has addressed working-age individuals with depression.

METHODS

STUDY AIMS AND DESIGN

The aim of this narrative review is to provide an updated and comprehensive view of the current knowledge related to the use of MT in the treatment of depression and closely related mental health conditions, including anxiety and exhaustion. To our knowledge, there were at least several large-scale studies conducted on this topic after the systematic review by Aalbers et al. (21) in 2017. We wanted to create an overview including these new studies and previous studies other than RCTs to enrich the view to this area of research. In addition, we wanted to widen the scope to also cover anxiety disorders and exhaustion that also largely affect individuals of working age.

Narrative review is a type of review article that provides a conceptual description of the topic (22). These types of review are common, for instance, in the medical literature (23). In comparison to systematic review, narrative review has a lot of

flexibility in terms of, for example, evaluating literature and organizing and presenting findings (22). Narrative review was chosen to be able to describe and deepen the knowledge of previous research that has already identified factors related to the effectiveness of MT. Based on previous reviews, we paid specific attention to not only the results but also to the methods, MT models and implementation of interventions used in different adult populations meeting the inclusion criteria. Scale for the Assessment of Narrative Review Articles (SANRA) (23) has been utilized in the writing process. The selection process of the studies is presented next.

INCLUSION CRITERIA

Several inclusion criteria were applied for this narrative review. Only studies applying MT conducted by certified music therapists were included. MT was defined as clinical use of music interventions based on scientific research using different elements of music, such as rhythm, harmony, melody, tone, dynamics, to meet specific goals within a therapeutic relationship by a credentialled MT professional (10). Also, only studies with human participants aged 18–65 with a primary problem in depression, anxiety, exhaustion, work-related stress or burnout were included. The studies had to be peer reviewed and reported in English.

SELECTION OF STUDIES

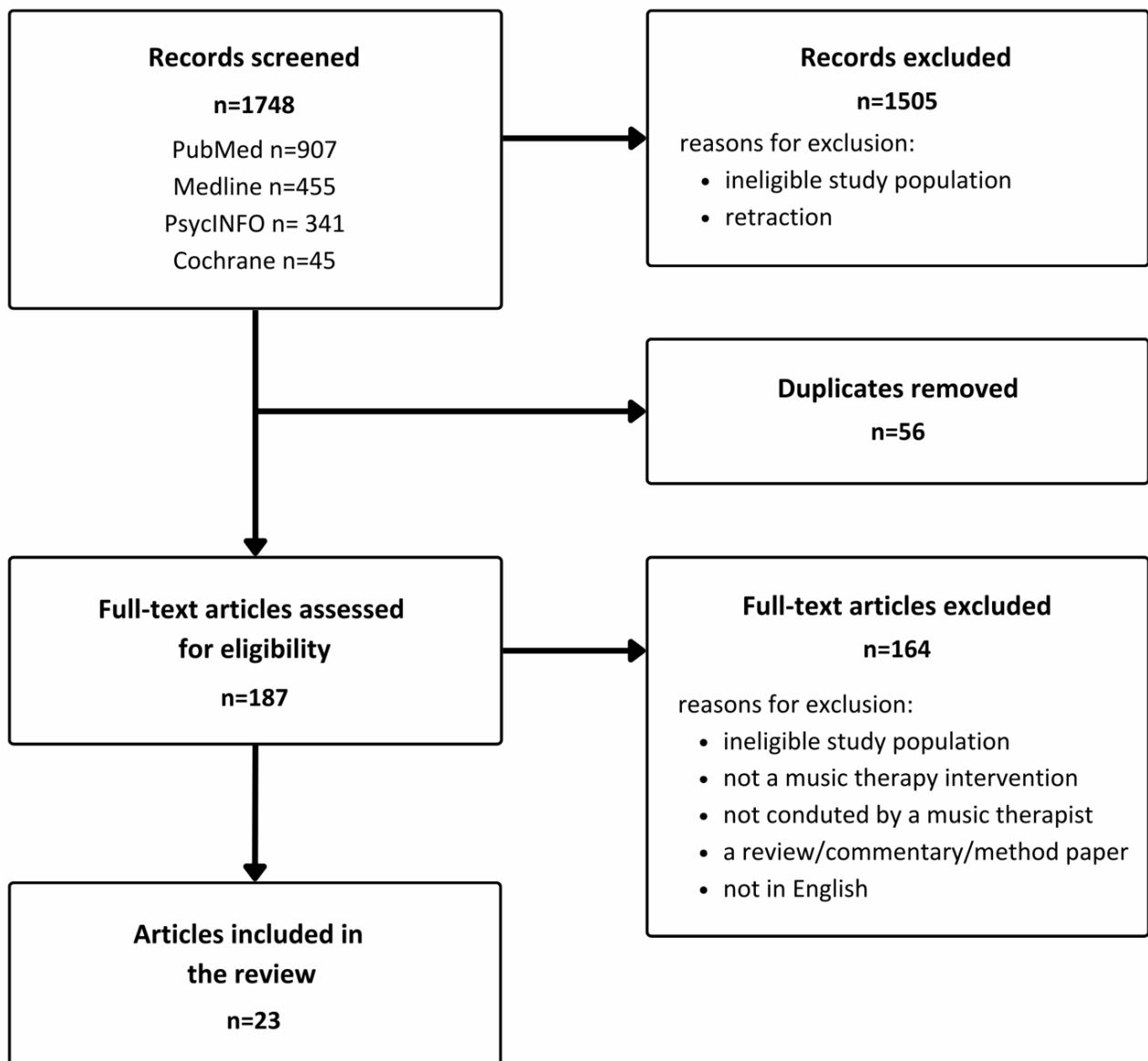
To identify the eligible studies, computer-based searches were conducted in the medical and psychological electronic literature databases including PubMed, Medline, PsycINFO and Cochrane Library. All studies that met the inclusion criteria were included in this review. The search string used was the following in English: ("music therap*") AND (depress* OR anxi* OR exhaust* OR burnout OR burn-out OR "burn out" OR "work-related stress" OR "job-related stress" OR "occupational stress"). In addition, we used four filters to limit the results. Records had to be peer-reviewed, published between 1.1.1992–27.5.2025, concern age groups from 18–65 (working-age individuals) and human population group. The starting point of the publication date range originated in the year of the first conducted randomized controlled trial (RCT) study in MT by Chen (24) and continued until the end of May 2025.

Altogether 1748 records were found and screened. 1505 records were excluded based on the record title that indicated ineligible study population, such as ineligible age group (under 18 years old or over 65 years old) or primary problem (e.g. cancer, dementia, stroke, personality disorders, acute substance abuse). Two of the records were excluded due to retraction of

the article. After this, 56 duplicates were indicated and a total of 187 articles were then assessed for eligibility by full-text articles. 164 were excluded due to ineligible study population, such as ineligible age group (under 18 years old or over 65 years old) or primary problem (e.g. cancer, dementia, stroke, personality disorders, acute substance abuse), intervention (not music therapy but, e.g. music listening), intervention being conducted by someone other than a certified music therapist (e.g. a researcher, a teacher, a nurse), article being a review, a commentary or, for example, a description of a method or in other language than English. A total of 23 studies met all the inclusion criteria for this review and were included in the review (*Figure 1*).

The literature was searched by two researchers independently. To ensure the inclusion of the newest articles, the same process was repeated a month later. The results were compared and discussed together with the whole research group.

Figure 1. Flow chart of the study selection process for this narrative review.



ANALYSIS

The articles were first read thoroughly to ensure the eligibility. The next step was focusing on study designs and aims, outcome measures and instruments, target groups, interventions, used MT methods or models, and results, implications and limitations of the studies. All this information was collected in a detailed table to be further analysed. *Tables 1* and *2* presented in this review are based on this detailed table. Also, Atlas.ti software was used to aid the coding and storing of the collected data. Content analysis was applied as described in (25) to summarize the present evidence, offer new knowledge based on the multiple original studies and describe how the present understanding of this particular topic should guide research, evaluation and clinical practice in future.

mainly related to the RCTs (26,28,37) and also to a feasibility study (35). Two of the RCT studies (26,27) are also included in the systematic review published by Aalbers et al. (21).

RESULTS

The included articles have been published between years 2011–2025 (see *Table 1*) and involved altogether 680 participants between ages 18–65 whose primary problem concerned depression, anxiety or work-related stress. Participants were adult outpatients with depression (26–31), adults or young adults with depressive symptoms (32–34), adult patients or outpatients with long-term depression (35), hospitalized patients with depression or schizophrenia (36), prisoners with anxiety or depression (37), adult outpatients with anxiety (38), adults with anxiety symptoms (39), hospitalized patients with anxiety (40) and working-age individuals on sick leave due to work-related stress (41).

Nine studies utilized individual MT settings, and six studies were implemented in group settings. In individual settings, reported session duration was mainly 60 minutes with the exception of one study having 120-minute sessions (41) and another study having varying duration between 20–65 minutes (40). The individual processes lasted from 4 weeks to 18 months including 1–45 sessions. Correspondingly in group settings, session duration varied from 60 to 120 minutes. These processes lasted 4–14 weeks including 4–42 sessions. Two studies did not report session length (34,36). Of the 15 original studies, seven were RCTs (26–28,30,34,37,41), two pilot studies (38,40), two feasibility studies (35,42) of which one (42) was a sub-study for one of the multiple single-case studies (33), three multiple single-case studies (32,33,39), one qualitative study (36), and two case reports (29,43) of which one (43) was a sub-study to an RCT (37). There were also five other sub-studies (43–48)

Table 1. Included articles.

Author(s) of the original study	Author(s) of the sub-study	Year	Study design	Individual (I) / Group (G)	Duration of Sessions (min)	Number of Sessions	Duration of Treatment	Follow-up	Age range (years)	Gender (m=male, f=female)	N	Drop-outs
Erkkilä et al.		2011	RCT	I	60	20	3 mo	6 mo	18–50	f+m	79	12
	Fachner et al.	2013	sub-study, case report						18–50	f+m	62	
Beck et al.		2015	RCT	I	120	6	9 wk	6 mo	n/a	f+m	20	1
Gutiérrez & Camarena		2015	pilot study	G	120	12	3 mo	n/a	25–45	f+m	10	3
Atiwannapat et al.		2016	RCT	G	60	12	12 wk	6 mo	18–65	f+m	18	3
Chen XJ et al.		2016	RCT	G	90	20	10 wk	10 wk	18–57	m	184	16
	Chen XJ & Hannibal	2019	sub-study, case report						30	m	1	
Zarate		2016	multiple single-case	I	60	12	12 wk	n/a	20–35	f+m	16	1
Aalbers et al.		2017	multiple single-case	I	60	7	7 wk	n/a	26–64	f	10	1
Lotter & van Staden		2019	qualitative research	I	n/a	8	4 wk	n/a	18–57	f+m	20	n/a
Aalbers et al.		2020	multiple single-case	I	60	10	10 wk	4 wk	19–30	f	15	4
	Aalbers et al.	2022	feasibility						19–30	f	11	
Erkkilä et al.		2021	RCT	I	60	12	6 wk	6 mo	19–57	f+m	70	7
	Hartmann et al.	2023	sub-study						19–57	f+m	58	
	Saarikallio et al.	2023	sub-study						19–57	f+m	64	
	Snape et al.	2024	sub-study						19–57	f+m	14	
Zhang et al.		2022	RCT	G	n/a	4	4 wk	4 wk	18–20	f+m	75	4
Carr et al.		2023	feasibility	G	90	42	14 wk	6 mo	37–55	f+m	30	12
	Windle et al.	2020	sub-study, interviews						n/a	f+m	10	
Brown et al.		2024	retrospective pilot	I	20–65	1–3	n/a	n/a	25–90	f+m	56	n/a
Gaebel, Stoffel et al.		2025	RCT	G	120	10	10 wk	10 wk	18–65	f	102	14
	Gaebel, Jarczok et al.	2025	sub-study						18–65	f	102	
Lund & Drago		2025	case report	I	60	45	18 mo	n/a	44	m	1	0

mo=month, wk=week

The search offered a multifaceted view to the use of MT in treatment of depression, anxiety and work-related stress in the working-age adult population (see [Table 2](#)). The majority of the studies had an emphasis on ameliorating depression and decreasing depressive symptoms, but improving anxiety, stress, self-esteem and emotion regulation were also the focus of many studies included in this review. Most of the studies were quantitative but there were also qualitative and mixed methods studies (34,36,48). Improvisation was the most used activity among the studies included. Nine studies (26,28,29,32,33,36,38–40) used improvisation in an individual

setting and six studies (27,30,31,34,35,37) in a group setting. Improvisation-based methods seemed to be effective in terms of recovery (26,28–34,36–40). Music listening in some form was used in nine studies (27,28,35–38,40,41,49) and songwriting in four (27,35–37) in an effective way. We will next introduce these studies in more detail.

Table 2. Methods and main results.

Author(s)/ year	Study design	Individual (I) / Group (G)	Methods, Active (A)/ Receptive (R)	Main findings
Erkkilä et al. 2011	RCT	I	A (IPMT)	improvement in general functioning, depression & anxiety
Fachner et al. 2013	sub-study			a link between increased theta power & decreased anxiety, decreased left fronto-lateral and fronto-central activity and differences in emotional expression & affect regulation
Beck et al. 2015	RCT	I	R (GIM)	improvement in wellbeing, mood disturbances & cortisol levels
Atiwannapat et al. 2016	RCT	G	A+R	statistically not significant trend towards better outcomes
Chen XJ et al. 2016	RCT	G	A+R	improvement in self-esteem, anxiety & depression
Chen XJ & Hannibal 2019	sub-study, case report			group MT has the potential to facilitate therapeutic growth and change
Erkkilä et al. 2021	RCT	I	A (IIMT)	improvement in quality of life, functioning, depressive symptoms & anxiety levels
Hartmann et al. 2023	sub-study			musical interaction seems to be associated with clinical improvement
Saarikallio et al. 2023	sub-study			emotional expression and awareness correlated positively with session value & MADRS change, pain in late part of MT predicted lower recovery
Snape et al. 2024	sub-study			listening homework seems to strengthen all kinds of effects of the therapy
Zhang et al. 2022	RCT + mixed methods	G	A (GIMT)	improvement in emotion regulation & depressive symptoms
Gaebel, Stoffel et al. 2025	RCT	G	A+R (GMT)	improvement in momentary depression, emotion and mood regulation and general health status
Gaebel, Jarczok et al. 2025	sub-study			positive effect on stress
Gutiérrez & Camarena 2015	pilot study	G	A+R	improvement in anxiety & depression levels



Author(s)/ year	Study design	Individual (I) / Group (G)	Methods, Active (A)/ Receptive (R)	Main findings
Carr et al. 2023	feasibility	G	mainly A	improvement in social adjustment & depression
Windle et al. 2020	sub-study, interviews			findings highlight the meaning of group dynamics in the therapeutic group process
Brown et al. 2024	retrospective pilot	I	A+R	improvement in anxiety
Zarate 2016	multiple single-case	I	A	improvement in anxiety
Aalbers et al. 2017	multiple single-case	I	A (ISIMT)	improvement in depressive symptoms
Lotter & van Staden 2019	qualitative research	I	A+R	instead of decreasing symptoms or improving mood, the goal of MT can be to enable emotion recognition and self-exploration
Aalbers et al. 2020	multiple single-case	I	A (EIMT)	improvement in emotion regulation & depressive symptoms
Aalbers et al. 2022	sub-study, feasibility			EIMT seems feasible to evoke changes in emotion regulation
Lund & Drago 2025	case report	I	A+R	there can be beneficial effects of combined MT and pharmacotherapy in outpatient treatment of depression

IPMT= Improvisational psychodynamic music therapy, GIM= Guided imagery and music, IIMT= Integrative improvisational music therapy, GIMT= Group improvisational music therapy, GMT= Group music therapy, ISIMT= Individual short-term improvisational music therapy, EIMT= Emotion-regulating improvisational music therapy

RANDOMIZED CONTROLLED TRIALS

Altogether seven randomized controlled trials studying the efficacy of MT and six related sub-studies appeared in the search. Trials are introduced here mainly in chronological order, but in such a way that the studies connected to each other are presented one after the other. The results of the trials suggest that MT is an effective treatment for depression and anxiety and also for work-related stress among adults of working age. It can be utilized efficiently in both individual and group settings with different kinds of active and receptive methods in various situations. Most of the authors identify a need for larger sample size even though they have already been relatively high and thus had mostly sufficient power.

The earliest RCT study included in this review was conducted by Erkkilä et al. (26) in 2011. The aim of the trial was to determine the efficacy of MT added to standard care compared to standard care only in treatment of depression in adult population (n=79). By the time of the publishing, it was the largest and most rigorous study in the field concerning working-age individuals with depression. The individual active MT model used was based on free musical improvisation with a mallet instrument, a percussion instrument and an acoustic djembe drum and reflective discussion. The created improvisations were recorded and thus possible to play back for further processing

and discussion. The authors found out that MT added to standard care improved the participants' levels of depression, anxiety and functioning. The effect did not, however, sustain as significant to the 6-month-follow-up. According to authors, the additional value of improvisational MT seemed to be the possibility to experience and be in contact with emotions associated with depression on a symbolic and non-verbal level. They also state that improvisational interplay in client-therapist dyad offers space for transference and creative imagery. Authors report that active music playing was important to many participants, and by playing they often expressed their feelings and inner pressure. In addition, they assume that the intensity of the therapy (two sessions per week) also contributed to positive outcomes. Participants' level of engagement in the therapy process was high.

To deepen the understanding of the neural mechanisms of the treatment, Fachner et al. (44) carried out a sub-study related to the RCT described above (26). They studied depression and anxiety in relation to frontal alpha asymmetry (FAA) and frontal midline theta (FMT) and analysed topographic changes before and after the MT intervention. According to the authors, at intake the participants' FAA and FMT scores were unexpectedly low in contrast to previous findings related to depressed populations (50). All the participants had a clinical diagnosis of depression, but fronto-temporal asymmetry found was significantly related

to anxiety. Results suggest a link between increased theta power and decreased anxiety as well as decreased left fronto-lateral and fronto-central activity, and differences in emotional expression and affect regulation emergent in MT.

Erkkilä et al. (28) later conducted another RCT (n=70) to build on the positive outcomes of the first one. In this trial they utilized integrative improvisational music therapy (IIMT) model. This 12-session intervention was a slightly elaborated version of the clinical model used in previous RCT. The instruments used were pianos and djembe drums for both the participants and the therapists. The aim was to investigate whether the IIMT model can be further enhanced with the additional elements of resonance frequency breathing (RFB) and listening homework (LH) in treatment of adult participants with depression. The authors learned that MT can significantly reduce depressive symptoms and that the model can be enhanced at least with RFB. The effect sustained until follow-up at six months. The intervention also decreased participants' anxiety levels during the intervention, but this effect was not seen at the follow-up. In addition, the intervention had a positive effect on participants' health-related quality of life and general functioning. Adverse events were rare, and the drop-out rate was relatively low. The authors identify lack of no-treatment control group and limited sample size as the main limitations for this study. The authors note that future studies would benefit from also having other than purely outcome-oriented measures to understand the results more thoroughly.

Related to the RCT by Erkkilä et al. (28), multiple complementary viewpoints were examined in separate sub-studies. Hartmann et al. (45) studied the correlation between client improvement and musical interaction among 58 participants. They found that clinical improvisations seemed to be more interactive in the middle of MT. The intensity of interaction was considered an indicator of increased emotional processing. The findings suggest that clients who benefited more from therapy also interacted more with the therapist and vice versa.

Delving deeper into emotional processing, Saarikallio et al. (46) studied Music therapeutic Emotional Processing (MEP) through client self-reports of 64 participants. The emergent MEP factors, expression, awareness and pain, were correlated with recovery from depression and clients' perceptions of the therapeutic value of the sessions. Musical expression of emotions (expression) and personal awareness of emotional experiences (awareness) appeared to be central aspects of favourable MEP, demonstrating positive correlations with experienced session value and recovery from depression. The pain factor was seen as more complex since, when not experienced until the end

of the therapy process, it predicted poor therapeutic outcome. Instead, the presence of pain at the beginning and in the middle of the process was seen as not beneficial but not harmful either, as music enables approaching difficult emotions in a symbolic, self-detached and bearable manner. Authors see this finding as potentially suggesting that the participants experiencing pain during the last sessions would have needed a longer process.

The additional component of listening homework, introduced in the above mentioned RCT (28), was studied by Snape et al. (47). Between the sessions, 32 participants were asked to listen to recordings of their clinical improvisations at home and fill out an online diary after listening. According to authors homework seemed to strengthen both positive and negative effects of the therapy. They reported that adherence to the homework was very low, and the experiences varied from extremely negative to positive. Challenges related to lack of motivation, stress, lack of time, technical problems and the severity of depression and anxiety. Their findings suggest that homework tasks need further investigation before implementation and should be utilized on a case-by-case basis, as difficulties in understanding the therapeutic music making, lack of skills to express oneself or a risk of dissociation can make the task intolerable.

The studies above had a focus on active MT methods where the participant is actively engaged in music creation. Instead, Beck et al. (41) studied receptive methods that utilize pre-composed music with Guided Imagery and Music (GIM) intervention to examine the effects of GIM on biopsychosocial measures of work-related stress and the length of sick leave. This was a two-arm RCT study (n=20) with MT and a wait-list control group. The intervention was based on the Bonny Method of Guided Imagery and Music (BMGIM) (51). Modifications such as including shorter music listening periods, music with less stimulating intensity profile and extra time for guided relaxation were used to meet the specific needs of the chronically stressed participants. Authors discovered that GIM was more effective than standard care alone in improving self-reported stress symptoms with this target group. It was shown to improve participants' wellbeing, decrease mood disturbances, anxiety and physical stress symptoms compared to wait-list controls. Early intervention showed a faster return to work and had an impact on perceived stress and psychological wellbeing. In addition, GIM group hormone test results indicated a reduction in cortisol levels compared to the wait-list controls. Authors found these findings encouraging and state that GIM is a promising short-term rehabilitation intervention for workers on long-term sick leave with stress. A need for a study with a larger sample size was recognised.

Only a year later Atiwannapat et al. (27) published an RCT study that compared the effects of active group MT intervention and receptive MT intervention to group counselling in treatment of major depressive disorder (MDD) in adult population (n=18). Both therapy groups showed improvement in depressive symptoms, but the results were not significant. The authors saw a trend that both MT groups improved more in terms of depressive symptoms and quality of life when compared to the control group. The effect seemed to sustain for at least three months. They also noted that the active MT group may have had a higher peak therapeutic effect, but the receptive group may have reached the peak effect faster. These findings should, however, be treated with caution due to the non-significant results. There were no dropouts in the active MT group, one out of five in receptive MT group and two out of four in control group. The authors suggest future studies to consider a wait-list control group instead of no-treatment control to reduce the drop-out rate. The authors identified the small sample size as one of the main limitations of the study. They, however, consider MT as an interesting adjunctive treatment of MDD.

Chen et al. (37) have also conducted an RCT in this field to investigate the effects of group MT on reducing anxiety and depression and improving self-esteem of Chinese prisoners (n=184). In this intervention, they used both active and receptive MT methods including clinical improvisation, music imagery and songwriting. Of these three methods, clinical improvisation was the most used. The results indicated that MT can help to reduce anxiety and depression and to improve self-esteem of prisoners with mental health problems. MT was helpful for prisoners in general but especially for those of a young age or low education level. The state anxiety of young prisoners improved faster compared to older prisoners during the therapy, but the effect didn't sustain until the end of the therapy. Concerning self-esteem, there was a greater improvement among younger prisoners. Lower education level was connected to more evidently reduced anxiety. Authors assumed that it might take less time for younger people to build a therapeutic alliance with the therapist and become engaged with the therapy. Younger people also tended to have less stable self-esteem compared to older people. The authors also assumed that criminal records might affect the future life of those with higher education levels. The drop-out rate was low and the most common reason for dropping out was transfer to another prison. Authors identified small sample size, lack of control group and lack of standardized measures as the main limitations of the study. They note that long-term effects of the therapy and its impact remain unclear and that more research is needed to examine the effects and also the therapeutic process to gain a more comprehensive

understanding of MT. However, they consider the findings as strengthening the randomized evidence for MT.

As a sub-study for the RCT above, Chen and Hannibal (43) published a case report illustrating the change process of one inmate that took part in the group MT intervention. The authors learned that music imagery can help one to bridge the inner world and deepen the inner exploration: improvisation can give one a freedom to experience and explore subconscious and conscious feelings through spontaneous music creation, and songwriting can enable one to convert their unconscious feelings and thoughts into words and melodies. By studying this process in more detail, the authors learned that group MT has the potential to facilitate therapeutic growth and change.

As the previous group MT study had a focus on prisoners, Zhang et al. (34) in turn studied the effect of Group Improvisational Music Therapy (GIMT) with college students (n=75) with depression and difficulties in emotion regulation. RCT design was applied. According to authors, statistical methods were used to measure emotional changes and semi-structured interviews to analyse the intervention effect. Their aim was to evaluate the effect of GIMT on student's depressive symptoms and ability to regulate their emotions. Free improvisation was used to create personalized music to stimulate emotional experiences. Emotional regulation abilities were also at the centre of the process, and the participants were required to record their positive coping strategies and feelings when facing emotional difficulties. The authors found out that the emotion regulation abilities had improved significantly in the GIMT group, whereas with the control group the result was the opposite. They also found out that the levels of depression had decreased significantly in the GIMT group. Authors state that GIMT encourages participants to musical improvisation that, for example, promotes emotional expression, enhances social skills and elevates self-esteem and self-confidence. The authors identify several limitations including the lack of later follow-up to measure the endurance of the effect.

Finally, Gaebel et al. (30,31) recently published two articles reporting the results of an RCT study about group MT in treatment of major depression disorder (MDD) in adult female population (n=102). Both papers are relevant in terms of this review, since the focus is not only on depression and anxiety but also on work-related stress, exhaustion and burnout. The aim of the authors was to evaluate the efficacy of group music therapy (GMT) in reducing depression and stress in this outpatient group compared to TAU. The results were in line with previous findings of the health-promoting effects of MT. In the depression-related article (30), the authors report that they were able to find greater reductions in momentary

depression compared to TAU but not in self- and observer-rated depression. Improvements in emotion and mood regulation and general health status were also found post-measurement when compared to TAU alone. However, these effects did not sustain to follow-up at ten weeks. The COVID-19 pandemic posed several challenges for the study, including subsequent data loss and higher drop-out rate, but the power of the study was nevertheless sufficient.

In addition, according to the article focusing on psychobiological stress regulation (31), the psychological stress outcomes indicated that MT had a more positive effect on stress than TAU alone. Thus, MT has the potential to improve emotion regulation and to promote health by influencing psychological and psychobiological stress. The study also emphasizes the potential of MT to influence both psychological and psychobiological stress (31). Authors state that this study includes sufficient power, a comprehensive evaluation of depression and methodological innovations that offer new knowledge and pave the way for future analyses (30). They, however, also indicate that more research with robust study designs and longer interventions, than the ten weeks applied in this study, are needed to see if the effects found can be sustained (31). In addition, they recognise a need to better understand the efficacy of individual interventions inside GMT method and thus the mechanisms of MT (30).

PILOT AND FEASIBILITY STUDIES

In addition to RCTs there were also pilot and feasibility studies, evaluating different MT methods and models conducted in this field, that met the inclusion criteria of this review. Two of the studies (35,38) explored MT in a group setting and two (40,42) in an individual setting. Two studies (38,40) had a focus on individuals with anxiety and the other two (35,42) on individuals with depression. Results were promising in all studies and authors saw MT having a positive effect on the symptoms and wellbeing of the participants. In two studies (35,38), the authors recommend more robust studies with some changes or further development. One study (40) utilized tailored interventions to meet the individual needs of the participants and found this approach promising. These studies are next presented in more detail. One of the studies (42) was found feasible as such. It is a part of a larger research project (33) and will be introduced in more detail alongside the main publication later in this article.

The pilot study (n=10) was conducted by Gutiérrez and Camarena (38) to explore the possibilities of a MT application to reduce anxiety and depression levels of patients with generalized

anxiety disorder (GAD) receiving pharmacological treatment. They applied both receptive and active MT methods in a group setting by using pre-recorded music, or music performed by the therapist, and by creating music themselves using either instruments or their own voices and bodies. Authors found out that the intervention significantly reduced both the anxiety and depressive symptoms. Authors speculate that using intense movement of the body in creative form might promote physical and psychological tension release and thus explain the positive effect of active MT methods. Authors were aware that music enhances the exploration of memories associated with challenging life events. They used receptive MT techniques to encourage and promote recall and emotion expression to be able to facilitate cognitive changes and modify irrational thoughts and beliefs, and thus to promote participants' abilities to manage conflict. Although the results are promising, authors recommend more robust studies in future with a bigger sample size, a control group, randomization and follow-up measurements to make the results more generalizable.

The feasibility and acceptability study in turn was implemented by Carr et al. (35). This study was about group songwriting MT intervention for adult patients (n=39) with long-term depression. They used Synchrony group MT with songwriting intervention that was mostly about working on songs with the possibility to rehearse and record or perform the created musical pieces at the end of the process. In the early phases, sharing pre-known songs was used as an ice-breaker. Also, group improvisation was used before songwriting. The outcomes suggested promising effect on depression reduction and social adjustment improvement, but this effect was seen at 3-month follow-up assessment only. Instead, numerous participants scored worse depression symptoms at post-testing. Thus, there was a delay in time with the effect. Overall attendance was poor, and the intervention needs further piloting regardless of being feasible and acceptable as such.

To increase the understanding of the individual experiences in the songwriting groups, Windle et al. (48) interviewed ten of the participants of the study by Carr et al. (35). They conducted semi-structured interviews to examine the process from the participants' perspective including helpful and unhelpful factors within the groups, and changes during the therapy and participants' contributions to possible change. Their phenomenological analysis revealed three themes, which were: 1) importance of group safety and cohesion, 2) music as a different means of processing feelings and experiences and 3) the importance of initial expectations, group composition and set-up. The qualitative findings highlight the meaning of group dynamics in the therapeutic group process, as the different

groups tended to prefer different approaches to songwriting based on individual preference and areas of discomfort. To some participants, group songwriting provided a sense of belonging and acceptance and feelings of achievement and satisfaction, while some participants felt that the personal issues they would have liked to address did not appear during this group therapy process.

Brown et al. (40) conducted a retrospective pilot study to understand the use of MT interventions on anxiety. Hospitalized patients (n=56) with verbally rated anxiety received mainly a single MT session of either active or receptive MT. The therapist tailored interventions to meet the individual needs of the patients and receptive methods such as music listening and music-assisted relaxation were the primary interventions used. Also, active methods including improvisation and writing new lyrics to familiar songs were used. The results of the study suggest that this kind of tailored MT intervention can significantly reduce the anxiety of adult hospitalized patients. Only 30 participants were between 18-65 years of age and thus on the scope of this review. However, according to the authors the results suggest responses to MT did not differ significantly based on demographic factors such as age or gender. Authors identified several limitations to this study including small sample size, researcher bias and restrictions of the retrospective nature of the study. They, however, state that this study shows that MT can be a valuable resource for hospitals in anxiety reduction and thus should be further investigated.

CASE STUDIES, PROCESS STUDIES AND CASE REPORTS

The studies in this section also underline the beneficial effects of MT and its possibilities in improving participants' everyday functioning, anxiety and depressive symptoms. The single-case study (29) and the multiple single-case studies (32,33,39) offer insight into the use of MT and identify promising patterns of change, while the qualitative study (36) goes deep into the verbal affordances of MT.

Zarate (39) conducted a multiple single-subject design (n=16) to evaluate and explore the effect of improvisational MT and vocal psychotherapy in the treatment of anxiety. The intervention offered was active MT based on clinical improvisation in an individual setting. According to the results, participants' anxiety levels decreased significantly during the therapy and especially during the first six weeks. The author recognizes a promising pattern of change in the results. They find it noteworthy that mild anxiety scores sustained throughout the study, but severe symptoms disappeared by the last session.

The author interprets this as a sign of improvement in everyday functioning and anxiety management, and states that the results indicate that MT is effective in alleviating anxiety symptoms among the convenience sample of young adults participating the study. The author, however, notes that the sample size was small and thus these findings should be interpreted with caution.

Aalbers et al. (32) conducted a multiple single-case study (n=10) and introduced an easily implementable research design especially for MT clinicians who want to evaluate and monitor the impact of their interventions. Active MT model called individual short-term improvisational music therapy (ISIMT) was used with the aim to reduce the degree of participants' depressive symptoms. The changes in depressive symptoms were evaluated by the participants themselves and their informal and formal network members, such as partners, friends, relatives, psychiatrists or psychologists. According to authors, the intervention showed promising efficacy in experienced and observed depressive symptoms. The majority of the clients experienced significant benefits from MT and had significantly fewer depressive symptoms after the intervention. The network members largely confirmed the changes and reported a significant reduction in observed depressive symptoms. Authors see the similarities and differences in the scores given by the participants and their network members as having a great potential in opening a dialogue about MT and, for example, participants' needs and true feelings they might struggle to express and share. However, the authors note that the results are restricted because of a small study population, and a lack of follow-up measurements and a control group.

Aalbers et al. (33) later conducted another multiple single-case study to assess the effects of Emotion-regulating Improvisational Music Therapy (EIMT) model in reducing depressive symptoms and improving emotion regulation in young adult students (n=15) with depressive symptoms. EIMT is an improvisation-based active MT model used in an individual setting. Instruments used are cello, marimbas and djembe drums. In this study researchers found both significant reduction of depressive symptoms and significant improvement in emotion regulation at post-tests and at follow-up measurement. All participants, for example, felt better, were less sad and less tense and less or not anxious, and reported improvement in emotion regulation after MT. These results were supported by qualitative analysis. Authors considered the sample size sufficient to gain insight and explore the effects of MT but note that further research is still needed to support the generality of the results. As a part of this larger research project Aalbers et al. (42) have also conducted a process evaluation to study the feasibility of EIMT method for use in practice for young adult

students with depressive symptoms in a university context. Authors found that the client attendance rate was sufficient as well as the treatment integrity of the programme. All in all, EIMT seemed feasible to evoke changes in emotion regulation in the target population.

Lotter and van Staden (36) conducted a qualitative study and explored the verbal affordances of active and receptive MT with hospitalized adults (n=20) diagnosed with either major depressive disorder (MDD) or schizophrenia spectrum psychotic disorder (SSD). They analysed a total of 131 individual MT sessions for this study and identified 13 themes that reflect the content of participants' verbal responses to participation in active music making, receptive music listening and client-therapist dialogue. The themes concerned feeling and doing, connection with and affection of others, the reclamation of vigour and resilience and various emotions. Authors see this thematic content as central working material of the sessions, giving the therapist valuable information about the client's experience of mutual understanding that is crucial in therapy. They believe this information can help the therapist to optimize and strengthen the MT intervention and engage and reach the clients in an optimal way. The results reveal the different mechanisms of both receptive and active methods related to each thematic entity. Receptive methods elicited, for example, awareness of internal states and emotions, hopes and desires, feelings of being stuck, loss and anxiety, and motivation towards change. Active methods evoked, for example, awareness of participation in music and physical states, experiences of agency, freedom and concentration issues, symbolic representations, and offered means for emotion release and self-reflection. Often, states and feelings emerged during receptive MT, and they were further processed and released with active music making.

Authors (36) also pointed out some key differences concerning the two diagnostic groups. The MDD group, for example, articulated specific inner states of feeling more readily and displayed awareness of the suppression of emotions and their fear of facing feelings. They also expressed experiences of not being able to move and being in darkness, states of sadness, helplessness and being heartbroken. In addition, the MDD group referred to suicide numerous times, but also reported, for example, feelings of hope, emotional awakening and increased motivation and desire for happiness, shifting perspective and experiences of stress release and liberation. According to the findings of the authors, both diagnostic groups seemed to benefit from the intervention. They reported feeling better and experiencing feelings of self-significance, and experienced that MT shifted their feelings, accessed their inner strength, renewed their motivation to persist, looked to the future and

altered their self-perception. Authors emphasize that their findings demonstrate how MT provides a space for the full extent of human expression, and that the goal of MT might as well be to create an environment that allows self-discovery and emotional awareness instead of improving negative mood or decreasing symptoms. Authors note that this study was limited to the verbal affordances of MT methods and that, for example, musical expressions might reveal more than was captured in it. Saturation of the data was attained suitably but the possibility of further themes emerging by other patients was also acknowledged by the authors.

A case report by Lund & Drago (29) describes a combination of pharmacotherapy and MT with a 44-year-old male, who had suffered multiple depressive episodes and was receiving treatment for depression in a hospital outpatient unit. He was also assessed with sub-threshold autism. Various medications had been tried in the past. Within the period of 18 months, the patient received 45 individual MT sessions consisting of music listening and free improvisation and continued with pharmacological treatment. During the process, the medication helped to relieve the symptoms, and MT helped him develop strategies for managing low energy and suicidal thoughts and offered a safe space to explore and process emotions. The authors note that this kind of single-case study does not allow for generalization but provides information about the beneficial effects of combined MT and pharmacotherapy in outpatient treatment of depression, and possibly inspires future research.

ADDITIONAL STUDIES

Finally, we will introduce several studies that did not fully meet our inclusion criteria and were not included in the review. They, however, offer some interesting views to the subject and are thus presented here as additional studies enriching the narration. Exclusions occurred due to ineligible study populations. One of the three studies (52) was focused on mental healthcare clients but only a part of the participants were diagnosed with mood disorders. Another two studies (53,54) were targeted to average student populations.

The effectiveness of resource-oriented MT versus TAU for mental healthcare clients with low motivation for other therapies was examined in a multi-centre RCT (52). MT seemed to be superior compared to TAU for negative symptoms, functioning, clinical global impressions, social avoidance through music and vitality. The attendance rates were promising, and MT seemed to help keep clients longer in contact with psychiatry, as their attendance in psychiatric assessment in the study was generally good. The authors emphasize that therapeutic attention should

be concentrated on the clients' strengths and potential.

Finnerty et al. (54) conducted an RCT on online MT in anxiety and stress management of undergraduate students. The comparison of online active MT, online receptive MT, online verbal-based therapy and no intervention control was conducted during COVID-19 pandemic to explore the efficacy of online group MT as a proactive intervention. Outcome measures showed significant reduction of anxiety and stress in all intervention groups with no significant between-group differences. Physiological measures turned out to be partly unreliable and unpowered due to recruitment issues, but the measured cortisol levels differed significantly between the receptive MT group and the control group. The authors suggest that many students could benefit from being able to choose the therapy type and that MT can provide an alternative option for students unable to access or reluctant to engage in verbal therapy.

Chen Q et al. (53) conducted a study about MT in treatment of student mental health challenges. The aim of the study was to evaluate the effectiveness of a 4-step structured MT programme in improving mood and symptoms of depression and anxiety among medical school students. Mental health issues were quite prevalent in this group but did not concern all participants. The implemented four-step programme included sociality, interaction via relaxation and music activities, music lessons and creative expression including creation of rhythms, songs or dances, sharing favourite songs and expressing feelings. Authors observed that the tailored four-step MT programme improved the students' mood regulation and overall wellbeing. The results were especially promising among male students, junior grade students and students specializing in clinical medicine.

DISCUSSION

The purpose of this review was to present an up-to-date and in-depth overview of the existing evidence related to the use of MT in treatment of depression and closely related mental health conditions, including anxiety and work-related stress and exhaustion in working-age population. The results indicate that MT is an effective treatment for these conditions and can be implemented successfully in both individual and group settings with many different methods. These include different modifications of improvisation-based working models (28,33,39), multi-method interventions with both active and receptive techniques (30,36,37), songwriting activities (35), guided imagery and music (41), and so on. These findings are consistent with the previous review of MT in treatment of depression by Aalbers et al. (21).

The conclusions of this review are based on 23 articles derived from 15 original studies involving altogether 706 participants, of whom 680 belong to the target group. Sample sizes in the articles ranged from one to 184 participants covering different kinds of study design from case reports to RCTs. By including different designs, we were able to reach comprehensive knowledge concerning both individual- and group-level phenomena. It is, however, possible that exclusion of studies conducted by experts other than music therapists and our definition of music intervention may have excluded some relevant information. This observation also concerns the exclusion of other than peer-reviewed articles that could have given some complementary information. This review also addresses studies reported in English only. Future studies could benefit from a wider language selection.

The attendance rate was sufficient among the included studies. Only one study (35) reported a high number of withdrawals. This was an intense group process conducted three times a week assessing the feasibility of a certain group MT method. In general, the drop-out rates were considerably low, and the participants were well engaged with the intervention. In some cases, the reasons for several dropouts were external, such as fear of infection due to the COVID-19 pandemic (30) or change in participants' location (37). In one of the additional studies, (52) it appeared that attendance rates in MT were promising even with clients with low therapy motivation. These results seem to resemble some previous findings about high motivation to participate in MT even in challenging circumstances (55,56).

In the field of MT research, similar to the fields of psychotherapy and other therapy modalities, large research designs are challenging to implement due to their complexity and cost. It appears to be typical that the same study leads to several different research reports that examine different details of the same study, and in many ways complement and enrich the information found using the actual outcome variables. During the data screening phase, it was, however, sometimes challenging to conclude which studies were independent and which ones were carried out as part of a larger research project. Transparency in reporting the relation to the original studies would help access the original sources, when needed, and deepen the understanding of the more exploratory findings in relation to the main study. In many cases this was achieved well. There also appeared to be major differences in defining MT. It turned out that in many cases pure music listening or therapeutic use of music conducted by someone other than a trained music therapist was considered as MT. These studies were not included in this review.

This review was targeted at working-age individuals between 18 and 65 years of age. Most of the studies had wide age range while others were focused on certain groups such as young adult students (33,34). One study (40) also included participants older than 65 years of age. These participants could not be separated from the analysis, but the results indicated that there were no significant differences in the effectiveness of MT due to participants' age or gender (40). This is an interesting and important finding that is both supported (26) and, concerning gender, challenged (34) by other included studies. In all included studies, gender was conceptualized in a binary manner, which may partly stem from the traditions of medical research. Some studies focused only on women (30,32,33) and some on men (37) partly due to circumstances and partly based on a decision to, for example, increase statistical power and prevent methodological bias (49). However, to achieve a more diverse understanding, in future research it might be worth expanding the concept of gender to also understand the specificities of MT and mental health in relation to participants of different genders.

In previous investigations, the intensity of the therapy has been assumed to contribute to the positive outcomes of the study. This is the impression gained in this review as well. However, the process can also be too intense and demanding and thus cause dropouts (35). The intensity of 1–2 sessions per week seems to be effective in the light of successful outcomes. Homework was used in some studies (28,42). In Erkkilä et al. (28) the homework component did not yield significant differences. Also, the more detailed findings of the related sub-study (47) were controversial. Homework task appeared to be difficult due to, e.g. motivational and technical issues or to the severity of depression or anxiety. Aalbers et al. (42) on the other hand also used homework and found it helpful in expressing emotions through music, in strengthening positive feelings and relaxation and in motivating the practice of emotion regulation in everyday life.

Musical improvisation has been reported to evoke expression of emotions and feelings and enabling self-exploration (26,42). It has also been seen as extending and complementing verbal expression and communication, enabling working with emotions on a symbolic, non-verbal level and offering an open stage for creative imagery and transference (26). Receptive methods were seen to serve as a stress management tool (41) and also as an ice-breaker before entering into active music making (35). The latter seems to be in line with some previous results that describe the role of music listening as a pathway leading towards more active agency of the participant (57). GIM also seemed to have a strong and long-lasting impact on mood-related

measures including depression, anxiety, mood disturbances and wellbeing (41).

Using research designs and collecting both quantitative and qualitative data from the therapy process can be beneficial for the clinicians in monitoring the quality and the effectiveness of their interventions (32). The results also indicate that it can be useful to involve participants, their families and other professionals treating them in the evaluation of the therapy process. It was reported that participants themselves found the use of questionnaires meaningful, giving them a clear insight into the effectiveness of the MT they had received, and that similarities and differences in results between participants and their networks can create discussion about what was helpful and not helpful in MT, what might cause the differences in the scores they have given, and so on (32).

As a general overview of MT research, one key limitation found in the systematic review by Aalbers et al. (2017) was the insufficient methodological reporting, for example, regarding the description of used interventions and specific diagnoses. Historically, MT research has been focusing mainly on case studies and reports and there has been a lack of larger scale and high-quality studies. In this current review, the impression of the reporting quality was overall more positive, and reporting tended to be more accurate and detailed than estimated before. Also, sample sizes tended to be bigger and MT interventions and models described in more detail. That said, the differences in reporting styles, and occasional deficiencies in reported details still raised some challenges in comparison of the studies since, for instance, some design was based on a very short intervention and reported with some deficiencies regarding the sessions conducted (34).

All in all, there was a lot of well-reported good quality systematic research based on studied MT interventions and models. Several studies (26, 28, 33–35, 41) also report that therapists are receiving specific training for the method used in the study. All this creates an impression that the research field is heading towards more internationally shared MT models. When assessing RCT studies the question of large enough sample sizes can, naturally, always be discussed and bigger sample sizes targeted. However, the sample sizes in the studies included in this review have already been well sufficient in power and would support the broader use of MT methods in treatment of working-age population with depression, anxiety and exhaustion.

In addition to larger systematic trials that could verify and enrich current results, it would also be necessary to gain more information about the factors explaining the underlying mechanisms of MT and the dynamics of therapeutic change.

The outcome-oriented trials offer fundamental information about the efficacy of MT. However, studying experienced therapeutic change requires different kinds of methods and viewpoints. For example, qualitative and mixed methods data exploring the therapy processes and participant and therapist experiences in more detail could offer views to the factors explaining therapeutic change and the internal mechanisms of MT. The ongoing study (iMTDep) for working-age individuals with depression-related disorders is applying and comparing active and receptive MT methods with a mixed methods study design and multimodal analysis of different types of data (58). Also, a study comparing the effectiveness of group arts therapies compared to group counselling for psychiatric patients (the ERA study) is currently under implementation (59).

This review offers information filling the gap in knowledge concerning latest MT research in this field. The results show that music therapy can be effective in treatment of depression when added to standard care and also in treatment of anxiety and stress. MT can be successfully implemented in both individual and group settings with multiple different methods such as improvisation, music and imagery, music listening and songwriting. MT can support agency, self-expression and emotion regulation, offer means for emotion release and promote wellbeing. In addition to improving mental health and decreasing symptoms MT seems to facilitate self-reflection and self-awareness. This information can be applied in future research, development of clinical practice and treatment policy.

Abbreviations

A: Active music therapy
ASD: Autism spectrum disorder
CCG: Current care guidelines
COVID-19: Coronavirus disease 2019
DLD: developmental language disorder
EBM: Evidence-based medicine
EIMT: Emotion-regulating improvisational music therapy
FAA: Frontal alpha asymmetry
FMT: Frontal midline theta
G: Group music therapy
GAD: Generalized anxiety disorder
GIM: Guided imagery and music
GIMT: Group improvisational music therapy
I: Individual music therapy
IIMT: Integrative improvisational music therapy
iMTDep: Integrative music therapy for depression
IPMT: Improvisational psychodynamic music therapy

ISIMT: Individual short-term improvisational music therapy
MDD: Major depressive disorder
MEP: Music therapeutic emotional processing
ML: Music listening
MT: Music therapy
R: Receptive music therapy
RCT: Randomized controlled trial
RFB: Resonance frequency breathing
SANRA: a scale for the quality assessment of narrative review articles
SSD: Schizophrenia spectrum psychotic disorder
TAU: Treatment as usual
VAT: Vibroacoustic treatment
BMGIM: the Bonny method of guided imagery and music
GMT: Group music therapy

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References

1. OECD/European Union. Health at a Glance: Europe 2018: State of Health in the EU Cycle [Internet]. OECD; 2018. [cited 2024 Nov 20] Available from: https://www.oecd-ilibrary.org/social-issues-migration-health/health-at-a-glance-europe-2018_health_glance_eur-2018-en
2. Kela. KELA | FPA. Mielenterveysongelmat veivät jo yli 100 000 suomalaista pitkälle sairauspoissaololle vuonna 2023 [Mental health problems caused over 100 000 long-term sick leaves in Finland in 2023] [Internet]. Kela; 2024. [cited 2024 Nov 20] Available from: <https://www.kela.fi/ajankohtaista/mielenterveysongelmat-veivat-jo-yli-100-000-suomalaista-pitkalle-sairauspoissaololle-vuonna-2023>
3. Terveyden ja hyvinvoinnin laitos (THL). [Finnish Institute for Health and Welfare.] Mielialahäiriöt [Mental disorders] [Internet]. THL; 2024. [cited 2024 Mar 21] Available from: <https://thl.fi/aiheet/mielenterveys/mielenterveyshairiot/mielialahairiot>
4. Terveyden ja hyvinvoinnin laitos (THL). [Finnish Institute for Health and Welfare.] Ahdistuneisuushäiriöt [Anxiety disorders] [Internet]. THL; 2024. [cited 2024 Mar 21] Available from: <https://thl.fi/aiheet/mielenterveys/mielenterveyshairiot/ahdistuneisuushairiot>
5. Aina Y. Understanding comorbidity with depression and anxiety disorders. J Am Osteopath Assoc. 2006 May;106(5 Suppl 2): S9-14.
6. Työterveyslaitos (TTL). [Finnish Institute of Occupational Health.] Miten Suomi voi? [How is Finland doing?] [Internet]. TTL; 2022. [cited 2024 Mar 21] Available from: <https://www.ttl.fi/tutkimus/hankkeet/miten-suomi-voi>
7. OECD. A New Benchmark for Mental Health Systems: Tackling the Social and Economic Costs of Mental Ill-Health (OECD Health Policy Studies) [Internet]. OECD; 2021. [cited 2024 Nov 20] Available from: https://www.oecd-ilibrary.org/social-issues-migration-health/a-new-benchmark-for-mental-health-systems_4ed890f6-en
8. Ahdistuneisuushäiriöt: Käypä hoito -suositus. [Anxiety disorders: Current Care Guidelines.] Suomalaisen Lääkäriseuran Duodecimin, Suomen Psykiatriyhdistys ry:n ja Suomen Nuorisopsykiatrisen yhdistyksen asettama työryhmä [Working group set up by the Finnish Medical Society Duodecim, Finnish Psychiatric Association and Finnish Youth Psychiatry Association] [Internet]. Helsinki: Suomalainen Lääkäriseura Duodecim; 2024. [cited 2025 May 20] Available from: <https://www.kaypahoito.fi/hoi50119>
9. Depressio: Käypä hoito -suositus. [Depression: Current Care Guidelines.] Suomalaisen Lääkäriseuran Duodecimin ja Suomen Psykiatriyhdistys ry:n asettama työryhmä [Working group set up by the Finnish Medical Society Duodecim and Finnish Psychiatric Association] [Internet]. Helsinki: Suomalainen Lääkäriseura Duodecim; 2025. [cited 2025 May 20] Available from: <https://www.kaypahoito.fi/hoi50023>
10. American Music Therapy Association (AMTA). What is Music Therapy? [Internet]. AMTA; 2005. [cited 2025 May 29] Available from: <https://www.musictherapy.org/>
11. Erkkilä J, Kontu E. Musiikkiterapia [Music Therapy] [Internet]. Käypä hoito -suositus. [Current Care Guidelines]. Helsinki: Suomalainen Lääkäriseura Duodecim; 2024. [cited 2025 June 10] Available from: <https://www.kaypahoito.fi/nix03414>
12. Hakutulokset musiikkiterapia [Search results Music Therapy] [Internet]. Käypä hoito -suositus. [Current Care Guidelines]. Helsinki: Suomalainen Lääkäriseura Duodecim; 2024. [cited 2025 June 10] Available from: <https://www.kaypahoito.fi/?s=musiikkiterapia>
13. Kela [Internet]. Therapies. Kela; 2025. [cited 2025 June 10] Available from: <https://www.kela.fi/therapies>
14. Kela [Internet]. Rehabilitative psychotherapy. Kela; 2025. [cited 2025 June 10]. Available from: <https://www.kela.fi/rehabilitative-psychotherapy>
15. Bruscia KE. The dynamics of music psychotherapy. Gilsum (NH): Barcelona Publishers; 1998.
16. Bruscia KE. Defining music therapy. Third edition. University Park, Illinois: Barcelona Publishers; 2014.
17. Edwards J. Methods and Techniques. In: The Oxford handbook of music therapy. Oxford University Press; 2017.

18. Grocke D, Wigram T. Receptive methods in music therapy: techniques and clinical applications for music therapy clinicians, educators and students. London; Philadelphia: Jessica Kingsley Publishers; 2007.
19. Geretsegger M, Mössler KA, Bieleninik L, Chen XJ, Heldal TO, Gold C. Music therapy for people with schizophrenia and schizophrenia-like disorders. *Cochrane Database Syst Rev*. 2017 May;5(5). Available from: <http://doi.wiley.com/10.1002/14651858.CD004025.pub4>
20. Geretsegger M, Fusar-Poli L, Elefant C, Mössler KA, Vitale G, Gold C. Music therapy for autistic people. *Cochrane Database Syst Rev*. 2022 May;5(5). Available from: <http://doi.wiley.com/10.1002/14651858.CD004381.pub4>
21. Aalbers S, Fusar-Poli L, Freeman RE, Spreen M, Ket JC, Vink AC, et al. Music therapy for depression. *Cochrane Database Syst Rev*. 2017(11). Available from: <https://www.readcube.com/articles/10.1002%2F14651858.cd004517.pub3>
22. Sarkar S, Bhatia G. Writing and appraising narrative reviews. *J Clin Sci Res*. 2021 July;10(3):169–72.
23. Baethge C, Goldbeck-Wood S, Mertens S. SANRA—a scale for the quality assessment of narrative review articles. *Res Integr Peer Rev*. 2019 Dec;4(1):5.
24. Chen X. Active music therapy for senile depression. *Zhonghua Shen Jing Jing Shen Ke Za Zhi*. 1992 Aug;25(4):208–10, 252–3.
25. Mikkonen K, Kääriäinen M. Content Analysis in Systematic Reviews. In: Kyngäs H, Mikkonen K, Kääriäinen M. *The Application of Content Analysis in Nursing Science Research*. Cham: Springer; 2020. p. 105–115.
26. Erkkilä J, Punkanen M, Fachner J, Ala-Ruona E, Pöntiö I, Tervaniemi M, et al. Individual music therapy for depression: randomised controlled trial. *Br J Psychiatry*. 2011 Aug;199(2):132–9.
27. Atiwannapat P, Thaisuttikul P, Poopityastaporn P, Katekaew W. Active versus receptive group music therapy for major depressive disorder—A pilot study. *Complement Ther Med*. 2016 June;26:141–5.
28. Erkkilä J, Brabant O, Hartmann M, Mavrolampados A, Ala-Ruona E, Snape N, et al. Music Therapy for Depression Enhanced With Listening Homework and Slow Paced Breathing: A Randomised Controlled Trial. *Front Psychol*. 2021 Feb 16;12:613821.
29. Lund HN, Drago A. Music Therapy and Pharmacotherapy as a Combination Treatment: A Case of Periodic Depression in Comorbidity With Subthreshold Autism. *Clin Case Rep*. 2025 Apr;13(4):e70229.
30. Gaebel C, Stoffel M, Aguilar-Raab C, Jarczok MN, Rittner S, Ditzen B, et al. Effects of group music therapy on depressive symptoms in women – The MUSED-study: Results from a randomized-controlled trial. *J Affect Disord*. 2025;374:1–10.
31. Gaebel C, Jarczok MN, Aguilar-Raab C, Rittner S, Warth M, Stoffel M, et al. Psychobiological Stress Regulation in Depressive Women Achieved Through Group Music Therapy: Results From the Randomised-Controlled Music Therapy for Depression Study. *Stress Health*. 2025;41(2):e70026.
32. Aalbers S, Spreen M, Bosveld-van Haandel L, Bogaerts S. Evaluation of client progress in music therapy: an illustration of an N-of-1 design in individual short-term improvisational music therapy with clients with depression. *Nord J Music Ther*. 2017 May 27;26(3):256–71.
33. Aalbers S, Spreen M, Pattiselanno K, Verboon P, Vink A, Van Hooren S. Efficacy of emotion-regulating improvisational music therapy to reduce depressive symptoms in young adult students: A multiple-case study design. *Arts Psychother*. 2020 Nov;71:101720.
34. Zhang M, Ding Y, Zhang J, Jiang X, Xu N, Zhang L, et al. Effect of Group Impromptu Music Therapy on Emotional Regulation and Depressive Symptoms of College Students: A Randomized Controlled Study. *Front Psychol*. 2022 Mar 31;13:851526.
35. Carr CE, Millard E, Dilgul M, Bent C, Wetherick D, French J, et al. Group music therapy with songwriting for adult patients with long-term depression (SYNCHRONY study): a feasibility and acceptability study of the intervention and parallel randomised controlled trial design with wait-list control and nested process evaluation. *Pilot Feasibility Stud*. 2023 May 5;9(1):75.
36. Lotter C, Van Staden W. Verbal affordances of active and receptive music therapy methods in major depressive disorder and schizophrenia-spectrum disorder. *Arts Psychother*. 2019 July;64:59–68.
37. Chen XJ, Hannibal N, Gold C. Randomized Trial of Group Music Therapy With Chinese Prisoners: Impact on Anxiety, Depression, and Self-Esteem. *Int J Offender Ther Comp Criminol*. 2016 July;60(9):1064–81.

38. Gutiérrez EOF, Camarena VAT. Music therapy in generalized anxiety disorder. *Arts Psychother.* 2015 July;44:19–24.
39. Zarate R. Clinical improvisation and its effect on anxiety: A multiple single subject design. *Arts Psychother.* 2016 Apr;48:46–53.
40. Brown CS, Patmon F, Freilich J, Heiderscheid A. A Retrospective Study: Reduction of Anxiety Through Music Therapy During Hospitalization. *Music Ther Perspect.* 2024 Apr 10;42(1):83–9.
41. Beck BD, Hansen ÅM, Gold C. Coping with Work-Related Stress through Guided Imagery and Music (GIM): Randomized Controlled Trial. *J Music Ther.* 2015;52(3):323–52.
42. Aalbers S, Vink A, De Witte M, Pattiselanno K, Spreen M, Van Hooren S. Feasibility of emotion-regulating improvisational music therapy for young adult students with depressive symptoms: A process evaluation. *Nord J Music Ther.* 2022 Mar 15;31(2):133–52.
43. Chen XJ, Hannibal N. Meet Hui in music: a case report of group music therapy for a Chinese male prisoner. *Nord J Music Ther.* 2019 Mar 15;28(2):75–87.
44. Fachner J, Gold C, Erkkilä J. Music Therapy Modulates Fronto-Temporal Activity in Rest-EEG in Depressed Clients. *Brain Topogr.* 2013 Apr;26(2):338–54.
45. Hartmann M, Mavrolampados A, Toiviainen P, Saarikallio S, Foubert K, Brabant O, et al. Musical interaction in music therapy for depression treatment. *Psychol Music.* 2023 Jan;51(1):33–50.
46. Saarikallio S, Toiviainen P, Brabant O, Snape N, Erkkilä J. Music therapeutic emotional processing (MEP): Expression, awareness, and pain predict therapeutic outcome. *Psychol Music.* 2023 Jan;51(1):140–58.
47. Snape N, Saarikallio S, Ala-Ruona E, Hartmann M, Brabant O, Erkkilä J. Depressed adults' experiences of listening to their own clinical improvisations at home: A process evaluation of the music therapy homework. *Nord J Music Ther.* 2024 Aug 7;33(4):299–318.
48. Windle E, Hickling LM, Jayacodi S, Carr C. The experiences of patients in the synchrony group music therapy trial for long-term depression. *Arts Psychother.* 2020 Feb;67:101580.
49. Gaebel C, Rittner S, Stoffel M, Jarczok MN, Aguilar-Raab C, Ditzen B, et al. Study protocol of the MUSED study: A randomized controlled trial to evaluate the psychobiological effects of group music therapy in women with depression. *Nord J Music Ther.* 2021 Mar 15;30(2):131–56.
50. Jakobi UE. A Meta-analysis about EEG-Alpha-Asymmetries and Depression in Adults: Proof of a vulnerability marker for depression? VDM Publishing; 2009.
51. Bonny HL. Music consciousness : the evolution of guided imagery and music. Gilsum, NH: Barcelona Publishers; 2002.
52. Gold C, Mössler K, Grocke D, Heldal TO, Tjemslund L, Aarre T, et al. Individual Music Therapy for Mental Health Care Clients with Low Therapy Motivation: Multicentre Randomised Controlled Trial. *Psychother Psychosom.* 2013;82(5):319–31.
53. Chen Q, Mao C, Qi L, Luo Y, Yang G, Wang L, et al. Music-based therapeutic interventions for medical school students with emotional regulation and mental health: a pre-post cohort study. *Front Psychol.* 2024 May 30;15:1401129.
54. Finnerty R, McWeeny S, Trainor L. Online group music therapy: proactive management of undergraduate students' stress and anxiety. *Front Psychiatry.* 2023 Apr 21;14:1183311.
55. Dingle GA, Gleadhill L, Baker FA. Can music therapy engage patients in group cognitive behaviour therapy for substance abuse treatment? *Drug Alcohol Rev.* 2008 Mar;27(2):190–6.
56. Wu Q, Chen T, Wang Z, Chen S, Zhang J, Bao J, et al. Effectiveness of music therapy on improving treatment motivation and emotion in female patients with methamphetamine use disorder: A randomized controlled trial. *Subst Abuse.* 2020;41(4):493–500.
57. Taipale M, Carlson E, Saarikallio S. The role of music listening in the music therapy process for people with anxiety disorders: The therapist's perspective. *Nord J Music Ther.* 2025 Mar 15;34(2):86–104.

58. Ala-Ruona E. Integrative music therapy for depression-related disorders [Internet]. 2024 [cited 2025 Apr 21]. Available from: <https://doi.org/10.1186/ISRCTN26812986>
59. Carr CE, Medlicott E, Hooper R, Feng Y, Mihaylova B, Priebe S. Effectiveness of group arts therapies (art therapy, dance movement therapy and music therapy) compared to group counselling for diagnostically heterogeneous psychiatric community patients: study protocol for a randomised controlled trial in mental health services (the ERA study). *Trials*. 2023 Aug 26;24(1):557.