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Development of an Improvisational Music Therapy Intervention for young Adults with depressive Symptoms: An Intervention Mapping Study

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Highlights

- Based on insights from theory, evidence and clinical practice, an improvisational music therapy intervention was described in order to reduce depressive symptoms among young adults
- Synchronisation and emotional resonance may change emotion regulation components, which may decrease depressive symptoms
- A multiple baseline study may give insight in the effectiveness and principles of the intervention

Abstract

Depression is a highly prevalent and seriously impairing disorder. Evidence suggests that music therapy can decrease depression, though the music therapy that is offered is often not clearly described in studies. The purpose of this study was to develop an improvisational music therapy intervention based on insights from theory, evidence and clinical practice for young adults with depressive symptoms. The Intervention Mapping (IM) methodology was used and resulted in (1) a model to explain how emotion dysregulation may affect depressive symptoms using the Component Process Model (CPM) as a theoretical framework; (2) a model to clarify as to how improvisational music therapy may change depressive symptoms using synchronisation and emotional resonance; (3) a prototype Emotion-regulating Improvisational Music Therapy for Preventing Depressive symptoms (EIMT-PD); (4) a ten-session improvisational music therapy manual aimed at improving emotion regulation and reducing depressive symptoms; (5) a program implementation plan; and (6) a summary of a multiple baseline study protocol to evaluate the effectiveness and principles of EIMT-PD. EIMT-PD, using synchronisation and emotional resonance may be a promising music therapy to improve emotion regulation and, in line with our expectations, reduce depressive symptoms. More research is needed to assess its effectiveness and principles.

Keywords

Improvisational music therapy; depressive symptoms; emotion regulation; young adults; synchronisation; intervention mapping.

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Background

Worldwide, depression is the most prevalent mental illness (Vos et al., 2015). Over 300,000,000 people of all ages are affected by depression (WHO, 2017). It is a common illness in many countries throughout the world and is generally found to be one of the most prevalent disorders in community epidemiological surveys, with a lifetime prevalence averaging approximately 12% and 12-month prevalence estimates averaging approximately 6% (Kessler et al., 2009). According to De Graaf and colleagues, depression is the most prevalent mental disorder (5.2%; 2012).

Depression is an emotion dysregulation disorder that impairs the capacity to label and identify affective states (Compare, Zarbo, Shonin, Van Gordon, & Marconi, 2014). Depression is often seriously impairing (Kessler et al., 2009). Earlier age of onset of first depressive episode is associated with greater illness burden, e.g. social and occupational impairment, poor quality of life, more negative view of life and the self, more depressive episodes, increased symptom severity, more suicide attempts and greater suicidal ideation (Zisook et al., 2007). Without adequate treatment, depression may become a recurrent and chronic disease (Moussavi et al., 2007).

An important risk group are young adults. Up to 20% of young people experience a depressive episode by the age of 18 years (Merry et al., 2011). Depression often affects their academic performance adversely (Andrews & Wilding, 2004). Students also face many stressors such as academic overload, pressure to succeed, competition with peers, lack of leisure time, less time to spend with their families and sometimes financial problems, which may lead to various mental health problems such as depression symptoms (Tosevski, Milovancevic, & Gajic, 2010). Because of the high impact and risks of early-onset depression, it is important to develop effective early interventions for young age groups, in order to prevent depression (Richards, 2011; Kessler et al., 2005; Merry et al., 2011, Werner-Seidler, Perry, Calear, Newby, & Christensen, 2017). This may have important implications for health policies in educational contexts (Andrews & Wilding, 2004), such as the development and implementation of in-school prevention programs for students in a university context.

Common treatment for depression includes a combination of medication and psychotherapy, often Cognitive Based Therapy (CBT). CBT is an effective therapy for depression (Butler, Chapman, Forman, & Beck, 2006), related to emotion regulation (ER) and changing appraisal

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of emotion. The altering of interpretations, e.g. reappraisal, is seen as a powerful way to improve ER in the course of CBT (Gross, 2014). Other adopted therapies for ER in depression have their main focus on awareness and acceptance respectively, e.g., Mindfulness Based Therapy (MBT; Khoury et al., 2013) and Acceptance Based Therapy (ABT; Aldao et al., 2010; Hofmann & Asmundson, 2008). Emotion-Focused Therapy adopts a person-centered approach for ER in depression (EFT; Greenberg, 2017) based on the principles of humanistic psychology, focussing on subjective experiences of a person to construct shared narratives and to give meaning (Locher, Meier, & Gaab, 2019).

In spite of the successes of various treatments for many people there are those who will not benefit from these prominent approaches (Kirsch, 2014; Nischal, Tripathi, Nischal, & Trivedi, 2012) and require further options to be provided. Recognising that not all existing treatment approaches will be useful for everyone, especially those treatments that rely on verbal reflecting and expressing (Coventry et al., 2011) there is space to consider how the effectiveness of a wider range of non-pharmacological treatments can be theorised and evaluated.

Music therapy may offer young people a promising non-pharmacological therapy with less focus on verbally reflecting on emotions and experiences. Music therapy is a clinical and evidence-based use of music to accomplish individualised goals within a therapeutic relationship by a trained music therapist (American Music Therapy Association, 2018). Music therapy can be delivered in a variety of contexts, both in groups and individually. Music therapy can be guided by different traditions, such as behavioural, psychodynamic or humanistic or person-centered. Methods can be both active and/or receptive. In active methods (improvisational, re-creative, compositional), clients make music and in receptive methods clients ‘receive’ (listen to music) music (Aalbers et al., 2017b; Bruscia, 2014, Edwards, 2016; Wheeler, 2015).

There is moderate evidence that music therapy is effective for depression, decreasing depressive symptoms, anxiety and improving functioning (Aalbers et al., 2017b; Erkkilä et al., 2011). Music evokes emotions, even without the interference of language and talking (Koelsch, 2014; Koelsch, 2015). Music therapy can be used to feel and express emotions (Erkkilä et al., 2011; Erkkilä et al., 2019) and tends to be readily accepted by individuals (Erkkilä et al., 2008; Erkkilä et al., 2011).

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To date, published trials show a lack of transparency in reporting detailed descriptions of music therapy for the treatment of depression or depressive symptoms (Robb, Carpenter, & Burns, 2011). Without these descriptions, clinicians cannot reliably implement interventions in their clinical practice and researchers may experience difficulties replicating studies (Hoffmann et al., 2014). Therefore, detailed descriptions of music therapy are needed and can provide thorough insight in what may work and how. This study aims to contribute to the need for a well-described improvisational music therapy. In this study we focus on young adults with depressive symptoms, because of the high impact and risks of early-onset depression (Richards, 2011; Kessler et al., 2005; Merry et al., 2011; Werner-Seidler et al., 2017).

The main purpose of the study is to provide a detailed description of a preventive improvisational music therapy intervention based on theory-, evidence- and practice-based evidence, for young adults with depressive symptoms (not diagnosed with a depressive disorder) who are in an outpatient setting. The intervention will be directed on ER using the Intervention Mapping method (Bartholomew et al., 2016). The objectives of the improvisational music therapy development are: (1) to identify a model to explain how emotion dysregulation may affect depressive symptoms; (2) to identify a model to clarify as to how improvisational music therapy may change depressive symptoms; (3) to develop a prototype music therapy treatment for preventing depressive symptoms; (4) to design a manual for improvisational music therapy aimed at reducing depressive symptoms; (5) to describe a plan for implementation of the improvisational music therapy; and (6) to summarise an evaluation plan to assess treatment effects and principles of EIMT-PD.

Method

Intervention Mapping

IM is a planning approach that can be used as an iterative and cumulative process for theory-, evidence- and practice-based development of health interventions (Bartholomew et al., 2016). The word ‘intervention’ in this study refers to treatment including an active, thoughtful, collaborative, respectful, and relational therapeutic process. It indicates that the therapy process is enacted with the intent to do something to change a client’s state (Edwards, 2016). In this study, all six steps of IM were described, e.g. (1) a description and model of the problem; (2) a description of how music therapy may change depressive symptoms; (3) a music therapy prototype treatment for depressive symptoms; (4) a music therapy manual for

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depressive symptoms; (5) recommendations for successful implementation; and (6) a summary of an evaluation plan to assess treatment effects and principles in respect to the treatment goals. Each of the six steps, was based on three sources, i.e. literature, practice-based knowledge combined with discussions with keypersons, and input from workshops. In intervention mapping studies, keypersons are people with specific expertise (Bartholomew et al., 2016).

Sources and procedure for each step of the Intervention Mapping process

Regarding the input from the literature, we searched in Ebsco/PsycInfo and Ebsco/CINAHL (June 2017) for studies using depression AND emotion regulation, emotion regulation AND synchronisation, depression AND synchronisation, music AND synchronisation, music AND emotion regulation. We searched in Google (July 2017) using evidence based AND implementation AND interventions AND schools. We performed a further search in January 2019. We used the review 'music therapy for depression' (Aalbers et al., 2017b) as a keydocument. Additionally, we used several handbooks on depression AND/OR emotion regulation, a handbook on intervention mapping and handbooks on single case research designs. We also checked reference lists of handbooks and eligible studies, organisational records and websites and asked content experts in case more information was needed.

Practice-based knowledge from the main author on music therapy and depression and discussions with keypersons were both used to describe concept narrative summaries and concept models. Models are graphic compositional figures containing relevant concepts to understand the problem of depressive symptoms (step 1, theory of the problem) and to understand how music therapy may change depressive symptoms (step 2, theory of change). Concerning keypersons, we needed people with specific expertise, i.e. student counselling, music therapy, depression, research methodology and/or implementation matters. Therefore we included music therapy trainees, music therapists experienced in music therapy for depression, a statistician (co-author), a neuropsychologist (co-author), a psychologist (co-author), a psychiatrist (co-author), a researcher (co-author), a head of counsellors, a counsellor, a head of school, a data protection officer, a data security officer and a marketing communication specialist as keypersons.

With respect to the input from the music therapy workshops, potential users (in this study students aged 16 to 40 years), music therapy trainees and music therapists experienced in music therapy for depression, joined a workshop and gave feedback concerning the music

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therapy prototype (step 3), including objective and rationale, improvisation, components of ER, instrument choice, musical components, the synchronisation technique, and emotional resonance.

For each step, we did a final member check in a subgroup of the team (authors of the study) to establish consensus of each narrative summary and for the two models and produced the consensus narrative summaries and consensus models (*Figure 1)*.

< Insert figure 1>

Purposes and tasks of every step in the Intervention Mapping process

The following is a detailed description of the main purpose and tasks of every step in the Intervention Mapping process. The main purpose of step 1 was to comprehend the problem of depressive symptoms. We defined determinants that could lead to dysfunctional ER and therefore depressive symptoms and created a model of the problem to visualise and improve comprehension of the problem of depressive symptoms (theory of the problem; *Figure 2*). The main purpose of step 2 was to gain insight into how music therapy may change depressive symptoms. Determinants that could change ER and therefore depressive symptoms were defined, change objectives were formulated and a model of change (theory of change) was created (*Figure 3*). The purpose of step 3 was to design a coherent, deliverable prototype for a music therapy intervention for young people with depressive symptoms. We held two-hour music therapy workshops to introduce a concept music therapy intervention to potential users, music therapy trainees and music therapists. Their experiences were used as input to further fine-tune the music therapy prototype. Also, to improve the completeness of reporting and replicability of interventions, we used the Guidelines for music-based interventions (Robb et al., 2010; Vink & Hanser, 2018), Template for Intervention Description and Replication (TIDieR) checklist and guide (Hoffmann et al., 2014), CONSORT 2010 template, SPIRIT 2013 and STROBE statement (Hoffmann et al., 2014; Boutron, Moher, Altman, Schulz, & Ravaud, 2008; Schultz, Altman, & Moher, 2010). Practice-informed, theory- and evidence-based change methods were chosen and intervention ingredients were generated, including intervention name, objective and rationale, participants, materials and procedure, provider of the intervention, mode of delivery, setting and location, duration, dose, tailoring, treatment fidelity, treatment adherence, outcome and monitoring (Hoffmann et al., 2014). The purpose of step 4 was to develop a music therapy manual for depressive symptoms. We described a general introduction to the sessions, a table of the ten-session music therapy manual including

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content and change objectives *(table 1)* and a description of each of ten sessions which we decided to document in the appendix to improve readability of the full study. The purpose of step 5 was to formulate a summary of implementation considerations to improve the quality of implementation of EIMT-PD within the university context. Implementation science is based on the desire to address challenges associated with evidence-based practice (EBP) and research, using a theoretical framework to understand how implementation may succeed (Nilson, 2015). Therefore, we decided to use the framework of Bartholomew and colleagues (2016) as a keydocument to report the results of this step. We identified program adopters, implementers, and maintainers, stated outcomes for stages of implementation, and designed an implementation plan. The purpose of step 6 was to summarise the main topics of an evaluation plan to study EIMT-PD.

Results

Step 1: Identify a model to explain how emotion dysregulation may affect depressive symptoms

Depression can be defined by a constellation of co-occurring symptoms that cause functional impairment in areas such as family and peer relations, as well as school, work and participation in activities. It can be present or absent or a continuum of symptoms (Rice, Davidovich, & Dunsmuir in Essau, Leblanch, & Ollendick, 2017). Symptoms include a depressed mood or diminished interest or pleasure, for a period of at least two weeks, representing a change from previous functioning. This is accompanied with at least four symptoms affecting behaviour (weight, sleep, movement, fatigue) and/or cognition (worthlessness or guilt, concentration or indecisiveness, thoughts of death). Functional magnetic resonance imaging studies provide evidence for functional abnormalities in specific neural systems supporting emotion processing and ER in people with depression (American Psychiatric Association, 2013). Risk factors for depression are highly complex. It is likely that they have a causal chain or multiple causal chains that are influenced by the interaction between biological, psychological and social risk factors (Kraemer, Stice, Kazdin, Offord, & Kupfer, 2014).

Emotion (dys)regulation is seen as one of the key features in depression (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Joormann & Gotlib, 2010; Ochsner & Gross, 2007). Individuals who experience episodes of depressive symptoms are characterised by an inability to regulate their emotions (Teasdale, 1988; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008).

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Maladaptive ER strategies, such as rumination (Liverant, Kamholz, Sloan, & Brown, 2011; Nolen-Hoeksema et al., 2008), a lack of savouring positive moments (Raes, Smets, Nelis, & Schoofs, 2012), a tendency to interpret emotional events in a negative way (Gross, 2014) and emotional suppression to inhibit effects of physiological states and emotional expression (Gross, 2014; Joormann & Gotlib, 2010) have negative effects on the development, intensity and duration of depression.

ER is a broad and complex concept (Gross, 2014). It is critical to adaptive functioning and refers to the ability to identify experience, modulate and express emotions (Bryant, 2015). The process of ER can be seen as a continuum of possibilities ranging from explicit, conscious, effortful and controlled regulation to implicit, unconscious, effortless and automatic regulation (Gyurak, Gross, & Etkin, 2011; Mauss, Bunge, & Gross, 2007). The Component Process Model (CPM; Scherer, 2009) may be helpful as a theoretical framework to explain the process of ER. According to this model emotion is seen as a biopsychosocial phenomenon involving a dynamic and coordinated response of five subsystems or components: (1) Feeling; (2) Bodily reaction; (3) Expression; (4) Action tendency; and (5) Appraisal (Scherer, 2005, 2009, 2013, 2015, 2016). The components of an emotion episode are the states of the five systems and the process of ER consists of the coordinated changes over time. People respond on meaningful events (environmental determinants) involving these five systems, where feelings are subjective feelings or experiences, bodily reactions are bodily symptoms and arousal, such as temperature sensations and trembling. Expression is facial and vocal expression, as well as gestures and posture. Action tendency is associated with emotional arousal (e.g. fight-flight tendencies) and appraise is the cognitive component of emotions that drive the coordinated changes in the aforementioned components (Scherer, 2004, 2016). Emotion can be defined as an episode of interrelated, synchronised changes in these systems in response to the evaluation of an external or internal stimulus (Scherer, 2005). One subsystem tends to elicit changes in other subsystems (Scherer, 2009) and the degree of synchronisation of the components generates awareness (Scherer, 2005; Grandjean, Sander, & Scherer, 2008). ER processing occurs at different levels, e.g. a low-level neural circuit, schematic level, a level involving various cortical association areas, automatically or deliberate and a conceptual level, involving prefrontal cortical areas (Scherer, 2009). Appraisal can also involve these different levels interacting with one another (Leventhal & Scherer, 1987).

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Concerning depressive symptoms, one could argue that when someone (a) does not adequately express feeling to others; (b) experiences difficulties in feeling; (c) is unaware of or shows inappropriate bodily reactions; (d) evaluates the consequences of events in an incorrect or unrealistic way; (e) or uses action tendencies in an inadequate way, one could expect emotion dysregulation (Scherer, 2009), leading to depressive symptoms *(Figure 2).*

< Insert figure 2>

Step 2: Identify a model to clarify as to how improvisational music therapy may change depressive symptoms

According to the theory of Scherer, reducing depressive symptoms needs a more healthy ER process, indicating that someone (a) expresses and communicates their feelings of anxiety; (b) becomes more aware of these feelings; (c) responds in a less tensed way; (d) appraises these feelings as 'normal and nothing to be afraid of'; and (e) does not withdraw (Scherer, 2009). Of these five aforementioned components, feeling plays a key role in ER, making a person aware of the emotion process with the purpose to monitor, reappraise, respond and express in an adequate way (Scherer, 2009; Fontaine & Scherer, 2013). Improvisational music therapy may affect these components of emotion regulation and in return reduce depressive symptoms. For example, Fachner and colleagues (2013) found that Psychodynamic Improvisational Music Therapy reduced feelings of anxiety in depression. The use of music in music therapy modulates activity in core emotion brain networks that function abnormally in patients with depression (Koelsch, 2015). Music may activate the central nuclei of the amygdala that is involved in the expression of emotion. The nucleus accumbens is involved in feeling, being activated for example when music is experienced as pleasurable. Music stimulates the insula that is involved in autonomic regulation and sensory interoceptive representation of bodily responses. Also, music stimulates the orbitofrontal cortex involved in the control of emotional behaviour and (consious and non-consious appraisal). Finally, it is suggested that the superficial amygdala, nucleus accumbens and mediodorsal thalamus constitute a network that modulates action tendency (approach-withdrawal behaviour) in response to socio-affective information such as music (Hou et al., 2017; Koelsch, 2009, 2010, 2014, 2015; Moore, 2013).

Improvisational music therapy has the potential to address all aforementioned components of ER. In improvisational music therapy, the music therapist starts after focusing on the action tendency and expression of the client. For example, the music therapist invites the client to

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choose an instrument. The client is encouraged to make a decision and move, thus stimulating the client's action tendency. As soon as both client and music therapist sit or stand behind an instrument, the music therapist invites the client to wait and feel, and then use the impulse or action tendency to start making music. Music can give rise to action tendencies in order to move to music (Koelsch, 2014). Music activates brain structures involved in movement (Juslin & Vastfjall, 2008; Koelsch, 2014) which may stimulate the client to act. It is possible to address the expression of emotions and become aware of feelings and bodily reactions. Making music could provoke the expression of emotions (Koelsch, 2014). In return, this musical expression in music therapy can evoke motoric expression or bodily responses (Klineburger & Harrison, 2015; Koelsch, 2014), such as frowning, sighing and smiling (Scherer & Fontaine, 2013 in Fontaine et al., 2013). These embodied emotions help the client to prepare for adaptive responses to emotion eliciting-events (Scherer & Fontaine, 2013 in Fontaine et al., 2013), e.g. stimulate and modulate approach-withdrawal behaviour (Koelsch, 2014). In this study, the music therapy is based on the ideas and principles of improvisational music therapy (Bruscia, 1987), emotion theories for depression (Gross, 2014; Scherer, 2009), music and emotion (Koelsch, 2015) and person-centered psychotherapy (Greenberg, 2017).

In order to change ER components, the therapist attunes and resonates to the music and movement of the client. In this process, the therapist waits for a moment, listens and attunes. Shortly after, the music therapist mirrors and emotionally resonates the client's music by closely observing and mirroring the musical and motoric expressions. Client and therapist now play together. During the music making, physiological feedback of muscular and autonomic activity may evoke corresponding subjective feelings, both positive and negative (Koelsch, 2014; Klineburger & Harrison, 2015). The client may gradually become aware of feelings, embodied emotions and thoughts. For example, playing low frequent beats at the cello or marimba activates the body (Koelsch, 2014), meaningful to a person that one was not or less aware of before, such as feeling safe and relaxed. In return, this may stimulate positive thoughts such as 'I know I can do this'. The moments in which a client becomes aware of these feelings are considered as meaningful moments (Maratos et al., 2011; Trondalen, 2016). The awareness of these feelings and the accompanied bodily responses could be stimulated by reflection on these moments and the way they are appraised by the client. This is used as a starting point to reappraise experiences. Emotional wording, imagination, metaphors and wording bodily sensations and feelings (Nummenmaa, Glerean, Hari, & Hietanen, 2012) are techniques to support this process. In turn, the use of these techniques may intensify

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emotional responses to music (Juslin, 2013). Besides reflection on these moments, the therapist can try to adjust clients feelings by starting another improvisation in which the client is invited to change musical expression (for example, play faster or louder) and in return express and feel differently.

Improvisational music therapy, synchronisation and emotional resonance

It is considered that changing the ER components -and as a consequence decreasing depressive symptoms- may be achieved by improvisational music therapy (Aalbers et al., 2017b; Erkkilä et al., 2011; Erkkilä et al., 2019). Improvisational music therapy uses musical improvisations in a therapeutic way, i.e. in an environment of trust and support established to meet the need of clients (Wigram, 2004). Musical improvisations are sounds created within a framework of beginning and ending. In improvisational music therapy, the therapist applies synchronisation as a technique of mirroring. The music therapist does what the client does simultaneously, in various levels of precision, timing so that their actions coincide. The therapist stays in the same modality of expression (same instrument, similar movement, matching pulse, rhythm, dynamic and/or melody) (Bruscia, 1987), may use canonic imitation (one or more beats behind what the client does; Bruscia, 1987) or desynchronise with one musical element (e.g. melody) and resynchronise with another (e.g. rhythm). During synchronisation, it is possible for the music therapist to resonate the emotions in music or to resonate non-verbal behaviour that is observed in the client during the musical improvisation. Research has shown that synchrony in music is an effective indicator to evaluate the expansion of positive emotive exchanges, as is seen among children with autism spectrum disorder (Venuti et al., 2017). In this way, synchronisation in music therapy is used to attune, emotionally resonate, elicit emotional responses (Bruscia, 1987), and facilitate the alliance (Koole & Tschacher, 2016).

From this perspective, it is possible to modulate the ER components by synchronising and resonating emotions or behaviour during the musical improvisations. For example, sounds can modulate arousal (calm, exited), music may express joy due to a faster tempo and the expression (smile) is copied, music can lead to empathy, perceived structural clarity is (cognitively) mirrored and sparks thoughts, movements are mirrored and may incite emotional processes (Koelsch, 2015). Also, a person that tends to withdraw, freeze, avoid or supress during an improvisation can be invited to ‘keep playing’ (using synchronisation and

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canonic imitation) and so helped to withstand, experience and reappraise bodily responses and meaningful feelings, such as anxiety and anger, but also fun and joy.

In between and after improvisations, verbal reflection is used in improvisational music therapy. This may give the client insight in emotional patterns, such as withdrawal and supression (Gold et al., 2009; Aalbers et al., 2017a, 2017b; Erkkilä et al., 2011; Leubner & Hinterberger, 2017; Porter et al., 2017). Experiential 'chunks' of words and 'broken stories' (Banning & Banning-Mul, 2005) can be used as a starting point to talk about experiences and feelings, such as guilt, insecurity or joy. Both feelings and bodily responses can be experienced at a more or less conscious level (Scherer, 2009). Also, this kind of reflection gives the possibility to relate musical experiences to ER and depressive symptoms in daily life.

Expected outcomes and change objectives

The main outcomes in EIMT-PD are to decrease depressive symptoms (primary outcome) and improve ER (secondary outcome). These outcomes may be achieved by (1) learning to express emotions; (2) learning to become aware of or monitor feelings adequately; (3) to become aware of bodily reactions or to improve bodily responses; (4) to reappraise events or improve evaluation of events; and (5) to adequately use action tendencies (*Figure 3)*.

< Insert figure 3>

Step 3: Develop a music therapy prototype treatment for preventing depressive symptoms

The music therapy prototype is in line with the CPM (Scherer, 2015) and the principles that music can evoke and modulate emotion (Koelsch, 2009; 2010; 2014; 2015; Klineburger & Harrison, 2017) for the purpose to reduce depressive symptoms (Aalbers et al., 2017b; Leubner & Hinterberger, 2017) using synchronisation (Aalbers et al., 2017b; Bruscia, 1987; Trondalen, 2016) and emotional resonance (Koelsch, 2015).

Name

Emotion-regulating Improvisational Music Therapy for Preventing Depressive symptoms (EIMT-PD)

Objective and rationale

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Music therapy is a form of therapy wherein the music therapist helps a person to optimise their health using music experience and relationships for the purpose of change (Bruscia, 2014). Improvisational music therapy (in this study EIMT-PD) is administered to improve ER and reduce depressive symptoms. Studies have shown that ER is a key feature in depression (Aldao et al., 2010; Joormann & Gotlib, 2010; Nolen-Hoeksema et al., 2008; Ochsner & Gross, 2007; Teasdale, 1988;) and music therapy, such as EIMT-PD may evoke and modulate emotions (Koelsch, 2015) contributing to favourable outcomes of ER and depressive symptoms (Aalbers et al., 2017; Erkkilä et al., 2011). One of the most powerful aspects of improvisational music therapy is that the therapist can convey empathy directly by mirroring what the client is doing (Bruscia, 1987). Emotional resonance using the Bruscia's music therapy synchronisation technique helps the therapist to attune in the musical alliance and the client or student with depressive symptoms to improve ER in the musical dialogue and in return reduce depressive symptoms. The CPM and music-informed hypothesised mediators of ER that were targeted in the intervention program are expression, feeling, bodily reactions, appraisal and action tendency. EIMT-PD is rooted in a person-centered psychotherapy context focussing on subjective experiences of a person also to construct shared narratives and to give meaning (Greenberg, 2017). Music therapy was used because it is plausible that young adults experiencing depressive symptoms are likely to employ music in an attempt to reduce their depressive symptoms (Thomson, Reece, & Benedetto, 2014).

Participants

Young adults aged 16 to 40 years in an outpatient setting with depressive symptoms.

Materials

A restricted selection of three different types of music instruments were chosen for music therapy purposes, including two mallet instruments (Aalbers et al., 2017a, 2017b; Erkkilä et al., 2011; Leubner & Hinterberger, 2017; Porter et al., 2017) (marimba; Erkkilä et al., 2011), two acoustic djembe drums (Aalbers et al., 2017a; Aalbers et al., 2017b; Erkkilä et al., 2011; Leubner & Hinterberger, 2017; Porter et al., 2017) and two celli (Aalbers et al., 2017a). These instruments were chosen, because together they cover all musical parameters (components), such as pulse, tempo, rhythm, melody, consonant and dissonant, and a wide variety in pitch and types of movements. The instruments are available for training and supervision of music therapists (Bradt, 2012) who provide EIMT-PD in a planned music therapy study. An ER-card is used for observation, reflection and evaluation purposes *(Figure 4).*

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< Insert figure 4>

Figure 4. Dutch version of the ER-card: 'Omgaan met emotie' [Emotion regulation].

(Including the aforementioned title Figure 4.)

Procedure

The basic principle of the intervention is to encourage and engage clients in musical improvisations creating sounds freely through instrument and movement (Aalbers et al., 2017a; Albornoz, 2011; 2016; Erkkilä, 2008; 2011; 2014; Gold, Solli, Kruger, & Lie, 2009; Porter et al., 2017). Sessions are client-led (Porter et al., 2017). Both therapist and client have identical instruments (Erkkilä et al., 2011). This enables the client to listen and use internal impulses or action tendencies. In return, similar instruments facilitate the music therapist to mirror and (partly) do what the client does simultaneously (Aalbers et al., 2017a; Bruscia, 1987; Trondalen, 2016), attune and resonate emotionally (Koelsch, 2010) the client's musical, vocal, facial and bodily expression using the music therapy synchronisation technique (Aalbers et al., 2017a; Bruscia, 1987).

The music therapy intervention is divided into three phases. Phase 1 (session 1-3) was designed to assess healthy and unhealthy emotional patterns, including expression, feelings, bodily changes, appraisal, and action tendencies experienced in music therapy, before, during and after improvisations and formulate a music therapy plan. Phase 2 focuses on a specific emotion component in each session, e.g. expression (session 4), feeling (session 5), bodily reaction (session 6), reappraisal (session 7), and action tendency (session 8) to improve emotion regulation inside and outside the music therapy situation Phase 3 (session 9-10) was designed to maintain healthy ER strategies in music therapy situations and to encourage using these healthy ER strategies in daily life for the purpose of decreasing depressive symptoms and improving ER. Also, there is time to evaluate and say goodbye using clinical improvisation and reflection.

Every music therapy session has a similar structure. Each session starts with some minutes for welcome and tune in by evaluating experiences of last week and discussing goals and content of the session. Then, the therapist invites the participant to choose an instrument, to feel and use external stimulus (instrument) and internal impulses (action tendencies) to start playing. The therapist mirrors the participant's choice by using the same instrument and encourages the participant to improvise using synchronisation and emotional resonance. After a first

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improvisation, the therapist asks the participant whether anything was noticed whilst playing and after a short reflection invites the participant to start a second or third improvisation. The music therapist can use the ER card and mirror physical impressions (like sighs or arm movements) for reflection purposes in between improvisations. During the session, the therapist observes whether there may be any harms due to the intervention. Each session finishes with some minutes to discuss what may be helpful to do and experience at home (Mausbach, Moore, Roesch, Cardenas, & Patterson, 2010), for example listen or play music, walk or talk. The music therapist reports their notes at the start, at the end, and after the session in a digital note file and works in line with the EIMT-PD manual and a music therapy privacy protocol.

Provider of the intervention

Professionally qualified music therapists (Bachelor or Master in Music Therapy) provide the music therapy (Aalbers et al., 2017b; Erkkilä et al., 2011; Leubner & Hinterberger, 2017; Porter et al., 2017) with specific expertise in the understanding of ER and management of people with depressive symptoms. Before implementation, they study the EIMT-PD manual and receive a music therapy training in EIMT-PD to be able to apply the intervention as planned.

Mode of delivery

The intervention is delivered face-to-face in an individual setting, e.g. therapist-client (Aalbers et al., 2017a, 2017b; Cuijpers et al., 2016; Erkkilä et al., 2011; Leubner & Hinterberger, 2017).

Setting and location

The music therapy sessions take place in one and the same private music therapy room (Aalbers et al., 2017a, 2017b; Erkkilä et al., 2011; Porter et al., 2017) which is easily accessible.

Duration, dose, dose adjustment and intensity

The EIMT-PD comprises of ten sessions. A total of ten music therapy sessions has been found effective in the treatment of adults with depression (Aalbers et al., 2017b). Individual music interventions for depression scored an above average improvement in depression after almost seven sessions (Leubner & Hinterberger, 2017). Individual music therapy sessions scored medium effect sizes after ten-24 sessions, and large effect sizes after 16 sessions (Gold et al.,

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2009). The sessions are offered in a time span of ten weeks, following the time schedule of the participants, to motivate them to join both school or work and intervention activities. Sessions are on a weekly basis (Erkkilä et al., 2011; Gold et al., 2009). All sessions last 60 minutes (Aalbers et al., 2017a; Erkkilä et al., 2011).

Tailoring

Participants that would like to receive more sessions will have the possibility to join extra music therapy sessions after the follow-up in the planned study.

Treatment fidelity

Before implementation, the music therapists participate in a music therapy training. The aim of the training is to experience, to understand and to be able to apply the theoretical and clinical fundamentals of EIMT-PD.

Treatment adherence

At the time of treatment and treatment evaluation, group-based supervision including real-time peer observation, training music therapeutic techniques using reflection-in-action and treatment adherence monitoring forms, is used for treatment adherence purposes (Erkkilä et al., 2011; Porter et al., 2017).

Step 4: Design a manual for improvisational music therapy aimed at reducing depressive symptoms

General introduction to the sessions

We introduce a fixed structure for the music therapy intervention. Change objectives will mostly play an implicit role in each session. The main focus should be on improvisations and experiences, whereas introduction and verbal reflection help to feel, become aware and verbally express. Every session, a predetermined emotion regulation component is at charge, although another component can be chosen in case this is more in line with wishes, needs or experiences of the participant at a particular moment. One could work on all components in one session and one specific component could play a more central role throughout the whole music therapy process (*Table 1*).

<insert table 1>

Step 5: Describe a plan for implementation of the improvisational music therapy

Program adopters, implementers, and maintainers

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EIMT-PD may be adopted and implemented by a music therapist, multidisciplinary team and research team in a mental health organisation including private practise or in a university context due to the potential benefit to clients or students experiencing depressive symptoms. Primarily, the intervention may be maintained in collaboration with a research group studying interventions and small *n*-designs. A music therapist, a research team, a manager, a data protection officer and a communication specialist are needed to make resources available, to maintain EIMT-PD and to ensure evaluation and data protection, including a private and easy accessible music therapy room, instruments, and resources for data protection and communication.

Stages of implementation

For adoption, important personnel may review EIMT-PD, agree to use EIMT-PD and to monitor results, and to stall data according to the European General Data Protection Regulation (GDPR; Rijksoverheid, 2018). Support should be gained to execute communication concerning informing and recruitment of participants and to make a music therapy room, instruments and important personnel available. For implementation, the project should be implemented, including deployment of important personnel, i.e. a marketing communications specialist, a music therapist, other health professionals or counsellors, a supervisor, and a data protection officer. Music therapists are trained to provide EIMT-PD. Marketing communications specialists take care of production of communication materials. Health professionals or counsellors ask people with depressive symptoms to participate in music therapy. Music therapists plan music therapy sessions with participants. A supervisor supervises music therapists for treatment fidelity. For maintenance, the leader of the project discusses with decision makers for continuation of EIMT-PD after a study and improve EIMT-PD based on the results of the study.

Implementation plan

For initial use, EIMT-PD may be implemented to decrease depressive symptoms in clients or for student health or student welfare and research purposes in a university context. Once effectiveness of EIMT-PD may be established (Bartholomew et al., 2016), evaluation findings may be used to improve EIMT-PD and to adopt and continue EIMT-PD. Other music therapy trainees and music therapists may be trained to implement EIMT-PD in health care centres, private practices or other universities. Further results and principles of EIMT-PD may be

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monitored using mixed methods, such as the systemic n-of-1 method (Aalbers et al., 2017a; Spreen, 2009).

Step 6: Summarise a plan to study the effects and principles of EIMT-PD

To evaluate the efficacy and process of EIMT-PD, we conducted a multiple baseline study (Kazdin, 2011; Van Yperen, Veerman, & Bijl, 2017). The study planned to enrol young adults who were students aged 16 to 40 years with depressive symptoms as assessed by using a self-report inventory of depressive symptomatology, scoring 14 or more on the IDS-SR (Rush et al., 1986). We wrote a study protocol before conducting the study, following the Template for Intervention Description and Replication (TiDieR) and guidance for content of study protocols, e.g. Standard Protocol Items: Recommendations for Interventional Trials (SPIRIT) (Hofmann et al., 2014). The study was registered and approved by the Ethics Committee of Medical Centre Leeuwarden, Netherlands (RTPO register: TPO1036; TPO1036.2.S), including informed consent before participants enter the study. We assessed the effects and process of EMT-PD. Primary outcome was depressive symptoms and secondary outcomes ER and Positive Affect (PA) and Negative Affect (NA).We used questionnaires, interviews, the Experience Sampling Method (Randall & Rickard, 2013), and notes. The results of this study will be reported in separate articles.

Discussion

The aim of this paper was to provide a theory-, evidence- and practice-based music therapy intervention for depressive symptoms. In EIMT-PD, young adults learn to improve their ER for the purpose of reducing their depressive symptoms. The intervention is delivered in an in-school, individual and face-to-face setting.

EIMT-PD has several strengths. The intervention focusses on young adults with ER difficulties and depressive symptoms in mental health settings and in-school context. Depression often emerges for the first time during youth. Therefore, the university environment may provide an ideal context to deliver programs such as EIMT-PD, with the potential to offset the trajectory towards development of a depressive disorder (Werner-Seidler et al., 2017). A focus on ER may also provide the opportunity to improve relationships and academic and work performance (Brackett & Salovey, 2004; John & Gross, 2004).

The Intervention Mapping approach was used, resulting in a well-described individual improvisational music therapy intervention that may also be applied in a group setting to

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allow more service users access to music therapy. The core elements of the intervention are based on theory (Domitrovich et al., 2008) and empirical studies, so it is clear on what basis claims are made (Crooke, Smyth, & McFerran, 2016). Several reviews and meta-analyses concerning music therapy and emotion, depression and emotion and music therapy and depression were used as key documents, then combined with practice-based knowledge of a music therapist and discussions in the team which included important key informants such as music therapists, a neuropsychologist, a psychiatrist and a student counsellor. Workshops were held to involve potential users and practitioners in the development of the intervention. Moving evidence-based practices into real-world settings is both a high priority and a challenge for researchers, practitioners and policymakers (Domitrovich et al., 2008).

Furthermore, the intervention was standardised using Guidelines for music-based interventions (Robb et al., 2010; Vink & Hanser, 2018) and COHORT (Schultz et al., 2010), TIDieR (Template for Intervention Description and Replication) and SPIRIT templates, which were used as checklist and guidance to optimise the efficacy and replicability of the described music therapy intervention in treatment and future studies. These templates can be used for all types of evaluative study designs, such as mixed methods studies (Creswell & Clark, 2010), cohort- and case studies, and trials (Hoffmann et al., 2014; Bradt, 2012). To ensure standardisation and the impact of the intervention, the implementation will be monitored (Domitrovich et al., 2008).

Finally, emotion dysregulation is a key feature in many other disorders, such as autism spectrum disorder and anxiety disorder. To date, the majority of the current research on emotion regulation has been diagnosis-specific (Choate-Summers, 2011). Similarly, EIMT-PD primarily focusses on improvement of emotion regulation for the treatment of depressive symptoms. Opportunities for future research remain (Choate-Summers, 2011). When EIMT-PD seems to be effective for depressive symptoms, this intervention may also be used as Emotion-regulating Improvisational Music Therapy (EIMT) or a trans-diagnostic art (music) therapy intervention (Sietsma & Van den Bos, 2016) to improve emotion regulation in other mental health problems than depressive symptoms and use emotion regulation as an outcome in studies (Ekkekakis, 2013).

This music therapy intervention has a number of limitations. We used the CPM model (Scherer, 2009) to explain what and how emotion regulation in music therapy may change depressive symptoms. Music therapists often report that emotion regulation (ER) is at the core

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of their work, but to our knowledge ER is never used as an outcome in music therapy studies. Although the framework is thoroughly built on theory and empirical studies, we assume this CPM model is useful for ER in music therapy to decrease depressive symptoms.

Furthermore, emotional resonance was used to describe a possible principle of how music may evoke emotions in music therapy. Emotional resonance refers to the evocation of an emotion due to a kind of mirroring (Koelsch, 2015). Although there is strong evidence that music evokes emotions (Koelsch, 2015) and feelings (Klineburger & Harrison, 2015), there is a scarcity of research on the principle of emotional resonance (Lundqvist, Carlsson, Hilmersson, & Juslin, 2009; Juslin et al., 2013). Therefore, we assume this principle may be a mechanism of the music therapy intervention.

Finally, synchrony may facilitate the alliance and boosts ER and therapeutic outcomes, such as depression (Koole & Tschacher, 2015). In music therapy, the Bruscia synchronisation technique (Bruscia, 1987) is a well-described technique in music therapy and is suggested to be useful for empathic and mirroring purposes. It may be related to synchrony in psychotherapy and used to facilitate the therapeutic alliance in music therapy, therefore improving ER and depressive symptoms. On the other hand, there is only very low quality of evidence as to the effects of this music therapy technique. A conducted multiple baseline study, assessing EIMT-PD for depressive symptoms and ER will give more insight on the effects of this music therapy intervention.

Overall conclusion

In conclusion, Emotion-regulating Improvisational Music Therapy for Preventing Depressive symptoms (EIMT-PD), using clinical improvisation, synchronisation and emotional resonance, may be a promising music therapy intervention based on theory-, evidence and practice-based evidence to reduce depressive symptoms and improve emotion regulation. It also gives both clinicians and researchers of future studies the possibility to use a well-described music therapy intervention in clinical practice, a university context and research. The results of a multiple baseline design study to assess the effectivity and process of EIMT-PD are planned to be reported in following articles, which may contribute to the body of knowledge on EIMT-PD for depressive symptoms and its principles. This may help managers, multidisciplinary teams, music therapists and researchers in both clinical practice and university contexts to implement and study EIMT-PD on a larger scale.

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Authors' contributions

SA and SvH conceived the idea of an intervention mapping study to describe EIMT-PD. SA developed the method section, established the team, drafted the manuscript and processed all feedback from other authors. RF helped reviewing and summarising the literature and drafting the manuscripts. AV, SvH, MS and KP helped discussing all six steps, drafting the manuscripts and supervising the research project. All authors read and approved the final manuscript.

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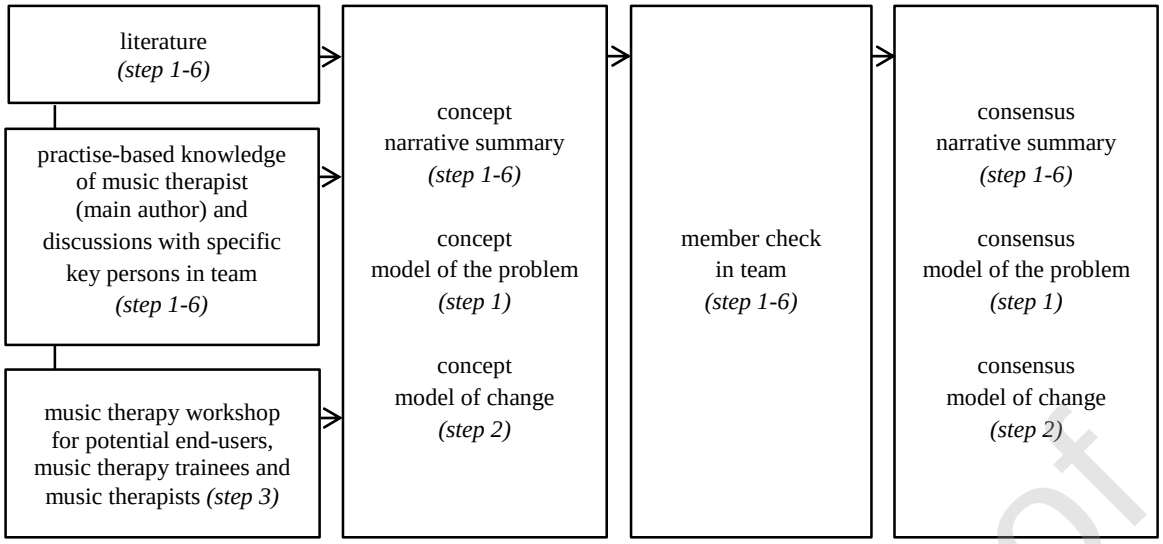

Figure 1. Procedural diagram for each of the six Intervention Mapping steps.

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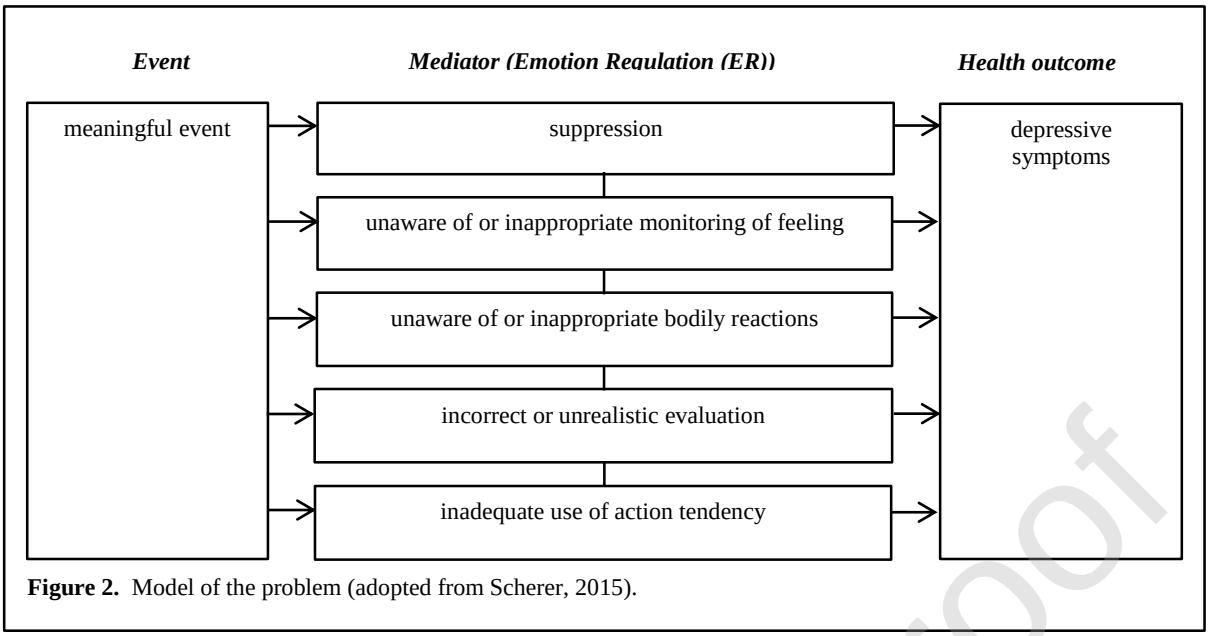

Figure 2. Model of the problem (adopted from Scherer, 2015).

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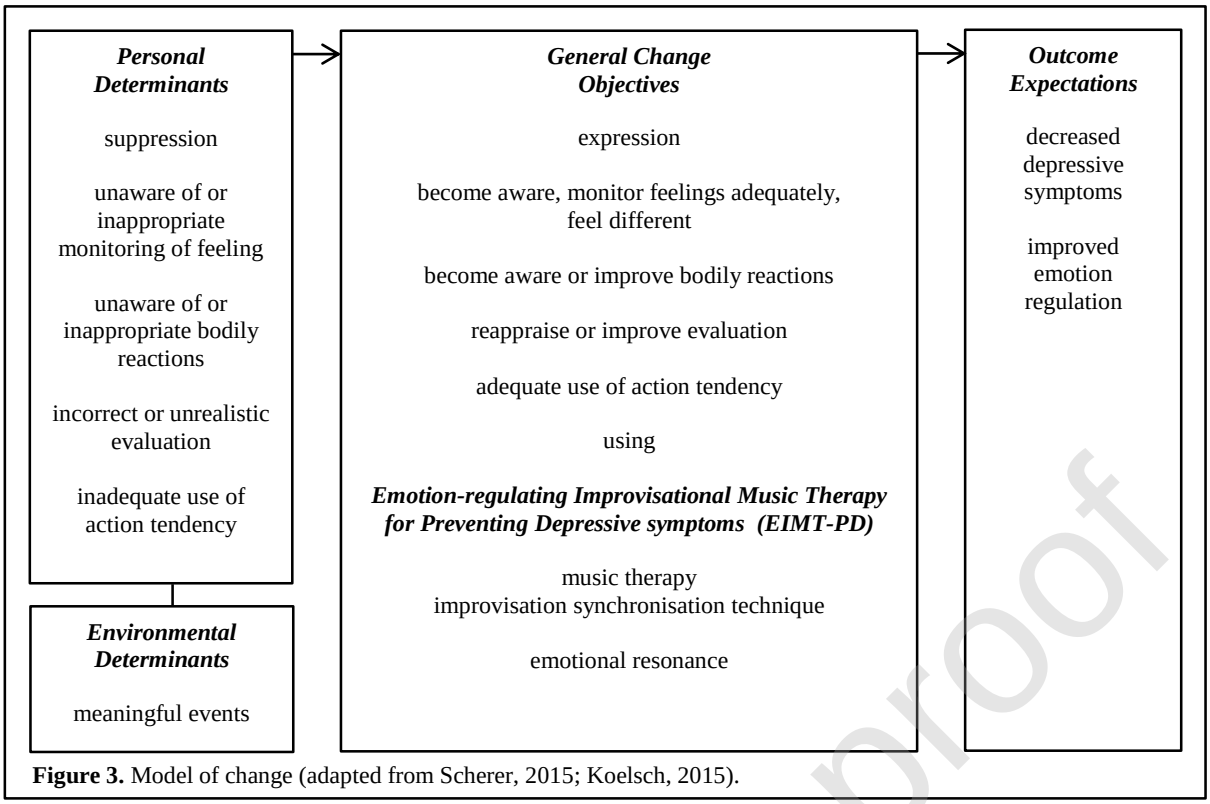

Figure 3. Model of change (adapted from Scherer, 2015; Koelsch, 2015).

Figure 4

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Table 1. The ten-session music therapy manual.

Session	Content	Change objectives
Phase 1		
1	Welcome, rationale of the problem, inform about EIMT-PD, exploration of the problem, introduction improvisation, exploration ER in music therapy, introduce homework, evaluate music therapy process.	Experience how depression is related to ER, understand personal emotion dysregulation, and formulate a top 3 of aims.
2	Welcome, rationale EIMT-PD, introduction ER card, improvisation, exploration ER in music therapy, invite exploration ER in daily situations, evaluate music therapy process.	Experience the principles of ER in music therapy to reduce depressive symptoms, understand personal emotion dysregulation.
3	Welcome, improvisation, reflection, plan of action, encourage with expression in daily situations using music.	Experience and understand personal emotion dysregulation related to one's depressive symptoms, formulate a music therapy plan to regulate emotions and decrease depressive symptoms.
Phase 2		
4	Welcome, introduction phase two, improvisation related to 'expression', reflection related to 'expression', improvisation related to changing expression, reflect on new experiences, homework to experiment with expression, evaluation music therapy process.	Express emotions.
5	Welcome, improvisation and reflection related to 'feeling', improvisation related to changing feeling, reflection on new experiences, homework to experiment with feeling, evaluation music therapy process.	Become aware of feelings, feel, accept feelings.

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6	Welcome, improvisation and reflection related to 'bodily responses', improvisation related to awareness of bodily responses, reflection on new experiences, homework to experiment with bodily responses, evaluation music therapy process.	Become aware of bodily responses to (meaningful) events.
7	Welcome, improvisation and reflection related to 'appraisal', improvisation related to reappraisal of events, reflection on new experiences, homework to experiment with reappraising meaningful situations, evaluation music therapy process.	Reappraise meaningful events.
8	Welcome, improvisation and reflection related to 'impulses or action tendencies', improvisation related to using action tendencies, reflection on new experiences, homework to experiment with other action tendencies in meaningful situations, evaluation music therapy process.	Become aware of and adequately use action tendencies.
Phase 3		
9	Welcome, introduction phase three, improvisation related to healthy ER, reflection related to learned ER, weaknesses and strengths, improvisation related to meaningful experiences, reflection related to new experiences, homework to experiment with healthy ER, evaluation music therapy process.	Maintain health emotion regulation in daily situations.
10	Welcome, discuss content of the session, evaluation of the plan of action, improvisation related to healthy ER, open reflections, encouragement to continue working on healthy ER, completion and	Experience and understand processes and results of one's ER related to the decrease of depressive symptoms, make final decisions how to regulate

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	saying good-bye.	emotions in daily situations, regulate emotions concerning saying good-bye and finish one's music therapy.

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