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The effects of music therapy on the interaction of the self and emotions—An interim analysis

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ABSTRACT

Objectives: Music therapy is a well-established non-verbal treatment method in psychiatry and psychosomatic medicine. However, empirical data of its impact on emotion modulation processes and personality dimensions are still sparce. An interesting concept is the use of music for emotion modulation in everyday life. The purpose of this interim study was to assess the interplay of personality dimensions and emotion modulation strategies in patients treated with music therapy versus patients without music therapy.
Design: A cross-sectional design was used.
Setting: The study was conducted during the course of inpatient treatment in a general psychiatric hospital. Data from n = 137 patients was included in the analysis.
Main outcome measures: According to the mediator model a regression analysis was performed using personality variables as potential predictors and emotion modulation variables as outcome criteria.
Results: In the music therapy group, insecurity predicted the use of music for both cognitive problem solving and positive stimulation in everyday life. In the non-music therapy group, cooperation and insouciance predicted the use of music for reduction of negative activation.
Conclusions: Specific personality dimensions predict greater targeted emotion modulation strategies if music therapy is applied than without it. That is, music therapy helps patients acquire more conscious (i.e. cognitive-related strategies) emotion modulation techniques by means of including their individual personality, whereas patients without music therapy simply "vent" their negative emotions (i.e. non-cognitive strategies). Conversely, the data suggest that music therapy can contribute to modify personality dimensions through the development of these emotion modulation strategies. This could be a plausible explanation for beneficial long-term effects of music therapy.

1. Introduction

1.1. The current impact of music therapy in mental disorders

Music therapy (MT) is a well-established non-verbal complementary therapy method used in psychiatry and psychosomatic medicine with a beneficial effect on global state, symptoms, and functioning. It is tolerated by almost all patients, shows next to no adverse events and shows large effect sizes if applied in the long-term.[1,2] A recent Cochrane meta-analysis on patients suffering from depression showed short-term beneficial effects of MT on depression and anxiety symptoms as well as on functioning when added to treatment as usual.[2] Another recent meta-analysis on five studies conducted in children and adolescents showed a significant superiority of music-based interventions compared to different interventions in reducing the severity of internalizing symptoms (i.e., depression and anxiety).[3] Besides, there is a wealth of highly interesting qualitative works, e.g. focusing on recovery and resource oriented effects of MT on mental health[4] or on social, identical and transcendental aspects of music in everyday life.[5] However, empirical quantitative data on the way MT affects the emotions and how MT modulates affectivity in everyday life are still sparce.

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1.2. Music and emotions

Music itself can have a very strong influence on the emotions. But the general state of mental health is closely linked to emotions, too. A variety of neurophysiological findings of music are known, e.g., impacts on the medial and dorsolateral prefrontal cortex, amygdala, nucleus accumbens as well as cortisol metabolism affecting both emotional and cognitive processes.[6] Not only are unspecific or universal effects of music on the emotions responsible for the positive effect of music on mental symptoms in clinical settings. But individual strategies derived from biographical musical experiences have a high impact on emotion modulation.[7,8] A simple stimulus-response model (music results in direct changes of organic processes) would be an insufficient explanation for the complexity of the presumed causal relationships.[7] Furthermore, psychosocial factors and personality dimensions have a major impact on emotion modulation processes.[9] Thus, considering that both emotion modulation processes and personality dimensions are core features of both the application of music and psychotherapeutic actions, the present study aimed to investigate the effects of MT on both emotion modulation processes and personality dimensions as well as their interaction.

1.3. The Use of Music for emotion modulation in everyday life (UofM)

Music can be consciously used to modulate emotions in everyday life, e.g. by listening to specific music for recreational purposes or in public situations.[9–15] For this behavior, the technical term “Use of Music for Emotion modulation in Everyday Life” (UofM) has become established. UofM means the active regular use of music in everyday life in order to modify existing everyday states (e.g. positive or negative emotions, arousal, concentration, vigilance or processes of social attachment). UofM represents an acquired behavior or action strategy which is applied consciously by individuals.[10,16] UofM explicitely does not mean playing music to an audience, even though this may be a way of using music for some individuals who like to perform. Much more often, UofM is deliberately choosing a particular music to listen to and thereby modulate emotions. DeNora[17,18] considers music not only a coping strategy, but also an active way of influencing emotions in everyday life. This means that the UofM may be an important suppressor or mediator variable with regard to existing affect and emotion, personality, and different behavioral variables (e.g. health-oriented behavior, coping strategy, or deviant behavior). UofM may function as a substantial acquired self-therapeutic intervention in specific psychological and physiological states of mind and may thus have an impact on mental health.[19] Since the introduction of this research paradigm, numerous studies have evaluated the relevance of UofM in everyday life.[20–25]

1.4. The UofM and the self-image

The studies of recent years have shown that the UofM is a behavioral strategy, with the help of which existing emotional states can be consciously and specifically influenced.[12,17,20,21,26–29] At first glance, this does not seem to be anything special, but on closer inspection it shows that this way of dealing with music not only has to be acquired, but also adapted to very personal habitual and situational characteristics. The result is that people who describe themselves as being insecure and have high emotional responsiveness, may attempt to modify those often unpleasant feelings through the emotion-modulating effect of various media and music in particular.[30–34] On the other hand, it is known that especially insecure and emotionally responsive individuals demonstrate greater and faster cognitive-affective processing (e.g. a higher rate of rumination) and are more prone to disorders, e.g. of the immune system.[35–40]

Thus, UofM can be considered an indirect mediator that has positive impact on the relationship between a person's self-image and general affectivity.[7,11,19] To make this possible, it is important for individuals to recognize their own self and to realize what emotional idiosyncrasies they have. On this basis, individuals develop strategies that emphasize positive aspects in everyday life and change negative ones. This is not just an "up and down" regulation of negative and/or positive emotions and affects, but rather a qualitative modification of emotions what von Georgi describes as “emotion modulation”.[9,10,14] The success of this modification depends – among other factors – on individual experience and socialization with music. Socialization refers to learning how to deal with emotions and stabilize the self-image. Furthermore it includes the development and internalization of different musical preferences in adolescence. The ability to self-awareness and the integration into a stable and predictable self-concept thus forms the basis for a health-supporting effect of the use of music in everyday life.

1.5. The UofM in patients with mental disorders

Thus, the UofM is useful for investigating the emotion modulation effects of music in patients with mental disorders. One study on UofM in psychiatric patients showed a more extensive UofM in patients with mental disorders compared to healthy controls.[14] In other words, patients with mental disorders – even if they were not treated with MT – use music much more intensively for emotion modulation in order to reduce negative emotions than healthy people.[41] However, music can enforce both positive and negative cognitive-affective cycles. The direction may depend on the diagnosis, individual UofM patterns and personality dimensions, beginning at an earlier point of time in an individual’s biography.

The use of music in a maladaptive manner might be used by some patients with mental problems,[25,42,43] though it is difficult to distinguish whether individuals with a specific psychopathology are more likely to employ music in an attempt to reduce their symptoms, or whether a maladaptive use to music is an expression of psychopathology.[25] Vuoskoski & Eerola[44] found the induction of changes in emotion-related memory and judgment by listening to sad music to depend on the music’s relevance to the listener, as well as on the personality attributes of the listener. As a single personality trait they also assessed trait empathy which was shown to contribute to the susceptibility to sadness induced by unfamiliar music, whilst autobiographical memories contributed to sadness induced by self-selected music. One study suggested that people with depression were more likely to engage in excessive listening to sad music and discussion of such music in a kind of “group rumination”.[42] Another study demonstrated that patients who prefer music with a negative subjective valence and those with a reduced UofM tend to show a maladaptive use of music, whereas specific personality traits (especially ego-strength, orderliness and confidence) tend to be resilience factors, which means that music can be used in more or less helpful ways.[9,41] Nevertheless, personality traits as well as the psychosocial functioning level were not as crucial for having a positive effect of music on mental disorders than adaptive UofM strategies were.[41] Therefore, patients with a tendency to maladaptive UofM are likely to benefit from a psychoeducation on the modulatory effect of music on emotions or MT itself.[41]

The challenge of research on UofM lies in chosing valid instruments to assess UofM strategies. To our knowledge, the questionnaire IAAM (Inventory for the Measurement of Activation and Arousal Modulation[12]) is still the most useful and best-evaluated tool for measuring UofM. In contrast, other instruments[45–48] capture passive reception behavior as defined by Behne[48] or do not distinguish between different qualitative levels of emotion modulation.

1.6. The role of music therapy on the UofM

One approach to a better understanding of the effects of MT is to study its effects on the UofM in patients with mental disorders. However, to our knowledge only one quantitative empirical study has

been conducted on the effects of MT on the UofM.[49] The results suggest a potential transfer effect of MT on the UofM; through music therapy, patients not only showed therapeutic effects in terms of a constructive treatment of their illness, but also modified their behavior in dealing with music in their everyday lives, thus paving the way for sustainable therapeutic effects, beyond the actual music therapy. However, interactions with personality dimensions have not been assessed.

1.7. Aims of the current interim analysis

In order to address this issue, a broad, cross-sectional study on a psychiatric population (Psychiatric Center Nordbaden Wiesloch/Germany) treated with MT versus patients without MT was initiated. Both variables related to the UofM and variables related personality dimensions were assessed. The study is still ongoing. The following assumptions were made for this interim analysis:

1.) Personality dimensions predict the way the patients use music in their everyday life.
2.) Patients without MT deal with music in a more unspecific, and partially maladaptive way.
3.) MT improves the way the patients use music in their everyday life towards the individual application of more specific and more helpful (adaptive) UofM patterns.
4.) The change of UofM through MT could in turn have an impact on self-image.

2. Methods

2.1. Subjects

The ongoing study was approved by the Ethics Committee of the regionally responsible medical association (Landesärztekammer of Baden-Württemberg, Germany), and was carried out in 2016 on four open psychiatric inpatient wards at the Psychiatric Center Nordbaden in Wiesloch, Germany. At the end of in-patient treatment, all eligible patients were asked to participate in the study and fill out the questionnaires, regardless of whether they had received MT or not. Patients with severe psychiatric symptoms, an inpatient treatment of 2 weeks or less or patients treated on a closed ward as well as patients with cause for ethical concerns about participating in a study were excluded. No previous musical knowledge or ability was expected from the patients. Patients were informed fully about the study procedure, the voluntariness and the anonymity of the study. Upon giving informed consent, the questionnaires were handed out to the patients, who were asked to return the questionnaires anonymously in a closed envelope within one week. Patients who did not complete the questionnaires were not included in the study. Finally, data from 137 patients (85 female; mean age 40.5 ± 12.9 years, range 18–66 years) were included in the interim analysis.

The study participants suffered from the following primary diagnoses: affective disorders (63.4%), neurotic disorders (14.2%), schizophrenia spectrum disorders (11.9%), addiction disorders (6.7%), personality disorders (3.0%) and organic mental disorders (0.7%) as diagnosed according to the criteria of the International Classification of Diseases (ICD-10)[50] and using specific diagnostic questionnaires such as the Structured Clinical Interview for DSM-IV (SKID-I/II) in the German version.[51]

All patients were treated with a routine psychiatric inpatient treatment program, whilst 82 patients were additionally treated with music therapy (MT group) and 55 patients were not treated with MT (Non-Music Therapy group; NMT). Both MT and NMT patients received psychiatric treatment as usual including psychotherapeutic and/or psychopharmacological interventions as well as supplementary specialist treatments such as ergotherapy and/or movement therapy, depending on individual clinical needs.

The MT department of the Psychiatric Center is located in a separate building, which ensures a good distance from routine inpatient treatment. A broad range of musical instruments is available there. MT is conducted by certified music therapists or MT students supervised by certified music therapists. In the MT sample, MT was performed once a week in a group setting. In particular cases, individual MT was additionally administered, (e.g. if patients could not be treated in a group setting initially or if individual treatment was indicated for therapeutic reasons). MT group sessions had up to 8 participants and took 60–85 min. The goals of each session were adapted to the respective treatment phase within the greater context of the current treatment process of the MT group. Sessions were based on the usual music therapy methods, such as free or topic-related group improvisations, depending on individual requirements, with subsequent reflection on cognitive-affective schemes, transformation processes and application of newly acquired schemes to the current life situation. Usually, inpatients who participate in MT have approximately 6 music therapy sessions. In this interim analysis, the MT group had an average number of 3.4 ± 4.6 (range 1–9) music therapy sessions.

Sociodemographic and clinically relevant data of this interim analysis are shown in Table 1. The primary diagnoses are shown in Table 2. Although addiction diagnoses seem to be underrepresented in the MT group, it should be mentioned that 7 patients in the MT group had a comorbid diagnosis of substance abuse, so this apparent underrepresentation was not statistically relevant. Affective disorders were overrepresented, but evenly distributed, so that the results of this interim analysis are largely interpreted based on patients with affective disorders.

2.2. Assessment and instruments

The following self-assessment questionnaires were used: The "Inventory for the Assessment of Activation and Arousal modulation through Music" (IAAM) with 62 items on a 5-point-scale shows high reliability and validity.[12–16,52,53] The IAAM was used to measure the situation-dependent everyday life UofM according to the parameters Relaxation, Cognitive Problem Solving, Reduction of negative Activation, Fun Seeking and Arousal Modulation. Personality dimensions were assessed by means of the Self-Concept Inventory ("Selbstkonzept-Inventar", SKI[54]) showing both high reliability and high validity.[54] The SKI is designed to register that part of the personality which results mainly from interpersonal interaction. The 5 scales, each comprising 8 bipolar items on a 7-point-scale, cover the following dimensions with sufficient reliability coefficients (Cronbach's Alpha): EGO-STRENGTH vs. Insecurity (sense of personal and existential security together with the lack of feelings of anxiety; $\alpha = 0.79$), ATTRACTIVENESS vs. Marginality (self-assessment of own worth in social groups; $\alpha = 0.90$), CONFIDENCE vs. Reserve (attachment capacity and intimacy; $\alpha = 0.85$), ORDERLINESS vs. Insouciance (degree of structuring in personal environment; $\alpha = 0.78$) and ENFORCEMENT vs. Cooperation (self-assessment of assertiveness in social groups; $\alpha = 0.74$).[14]

Table 1
Sociodemographic and clinically relevant data of the studied sample (in case of mean values with standard deviation); CGI-I: Clinical Global Impression Score I.

Variable	Patient group		total
	NMT (n = 55)	MT (n = 82)	(n = 137)
Age [years]	42.7 ± 12.9	39.6 ± 12.1	40.5 ± 12.9
Gender* female/male [n]	27/28	58/24	85/52
CGI-I [score]	4.9 ± 0.8	5.0 ± 0.7	4.9 ± 0.7

* Significant group difference between non-music therapy (NMT) and music therapy (MT) group.

Table 2
Main diagnoses within the total sample (n = 137), and the subgroups (MT = music therapy, n = 82; NMT = Non-music therapy, n = 55).

Diagnostic group according to ICD-10[43]	Patient group		total
	NMT [n (%)]	MT [n (%)]	[n (%)]
F1 (addiction disorders)	9 (16.4)	0 (0.0)	9 (6.6)
F2 (schizophrenia spectrum disorders)	13 (23.6)	3 (3.7)	16 (11.7%)
F3 (affective disorders)	25 (45.5)	60 (73.2)	85 (62.0)
F4 (neurotic disorders)	5 (9.1)	14 (17.1)	19 (13.9)
F6 (personality disorders)	2 (3.6)	2 (2.4)	4 (2.9)
others	1 (1.8)	3 (3.7)	4 (2.9)
Total	55 (100.0)	82 (100.0)	137 (100.0)

2.3. Statistical procedures

Regression analyses were undertaken according to the mediator model by von Georgi,[10],[11] with the SKI scales as potential predictors and the IAAM scales as criterion variables of the subgroups. Effect sizes should be interpreted according to Cohen.[55]

For possible gender and age effects, IAAM scales were first tested for differences between the MT and NMT group using the two-tailed Student's t-tests and chi-squared -tests. As a first step, the therapy groups (MT and NMT) were tested for possible gender differences. Because of a significant gender effect ($p < .01$; Chi^2), the IAAM-Scales were tested for interaction effects between gender and therapy group and their correlation with age. Because of significant results in most of these analyses (< 0.05), all IAAM scales were corrected for the influence of age and gender by computing the unstandardized residuals (UR). Regression analyses were repeated with the unstandardized residuals of the IAAM scales.

In this interim analysis the term "significant" was used for results with a p-value of ≤ 0.05. The data were analysed using Statistical Package of the Social Sciences (SPSS 21.0 for Windows) software.

3. Results

The results are shown in the Fig. 1. Regression analyses were performed for n = 77 MT patients and n = 54 NMT patients. For patients in the MT group, reduced ego-strength (β = −0.334) predicted the use of music for cognitive problem solving (R = 0.471, p[df = 5;55, F = 3.138] = .015 (*f* = 0.53) (UR: F = 3.042; p = .017)). The personality dimensions enforcement (β = .237), confidence (β = .231) and reduced orderliness (β = −0.223) showed a corresponding trend. Reduced ego-strength (β = −0.280) predicted the use of music for fun seeking through music (R = 0.435, p[df = 5;60, F = 2.795] = .025 (*f* = 0.48) (UR: F = 2.738; p = .027)). The personality dimension reduced enforcement (β = −0.228) showed a corresponding trend. Within the NMT group, reduced enforcement (β = −0.365) and reduced orderliness (β = −0.364) predicted the use of music for reduction of negative activation (R = 0.564, p[df = 5;33, F = 3.076] = .022 (*f* = 0.68) (UR: F = 2.980; p = .026)), which was not the case within the MT group. Furthermore, patients of the MT group reported to be more attentive ($p < .001$) towards music and engage more with music in everyday life ($p < .001$) than patients of the NMT group. When controlling for age and gender, these effects are maintained. This implies, that age and gender have a significant impact on UofM (younger people and women use more music),[14] but do not have a significant impact on the relation between UofM and the personality.

4. Discussion

4.1. Impact of this interim analysis

Music has a great impact on health and contributes to one's living a thriving and flourishing life.[56–58] Thus, MT can be helpful in improving the everyday life of persons suffering from mental disorders. This assumption is underlined by the results of previous studies according to which patients with mental disorders report a strong use of music for emotion modulation in everyday life[14] and the majority of patients report a positive valence of music which they experience as beneficial.[41]

To our knowledge this is the first study comparing complementary MT versus treatment as usual (i.e. without MT) in a psychiatric population by investigating UofM and personality dimensions based on psychometric instruments. This interim analysis largely confirmed our original main assumptions:

Ad 1) Personality dimensions predicted UofM patterns

Relationships of personality dimensions and the ways patients use music for emotion modulation have already been shown.[9] The results of the current regression analyses underline personality traits which impact individual UofM patterns, e.g. MT patients with increased insecurity employed more UofM in order to solve problems and for more fun seeking (see also below).

Ad 2) NMT patients reported UofM in a more unspecific, and partially maladaptive way

In NMT patients reduced enforcement and reduced orderliness predicted the use of music for the reduction of negative affects. In these patients music might remain a medium that is predominantly used for the ventilation of emotions, depending on the self-image. Thus, UofM can be considered a non-cognitive or a non-conscious strategy in NMT patients.

Ad 3) MT could be the basis for enabling more conscious and adaptive UofM patterns

The data show that in MT patients increased insecurity (e.g., self-doubts) predicted an increased use of music for cognitive problem solving and for positive stimulation (fun seeking). This insecurity (or reduced ego-strength) can be considered to indicate an equivalent of

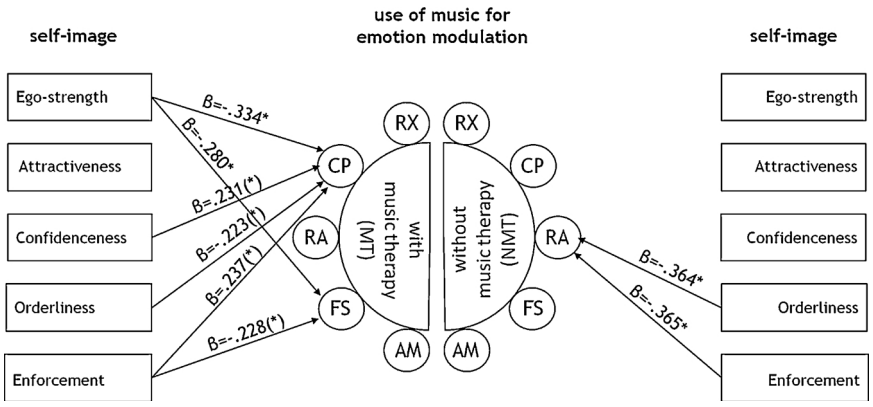

Fig. 1. Results of the regression analyses for the music therapy group (MT, n = 77) and non music therapy group (NMT, n = 54). Regression from self-image (SKI) on Cognitive Problem Solving (CP-MT): R = .471, p[df = 5;55, F = 3.138] = .015 (*f* = 0.53) (UR: F = 3.042; p = .017); Fun Seeking (FS-MT): R = .435, p[df = 5;60, F = 2.795] = .025 (*f* = 0.48) (UR: F = 2.738; p = .027); Reduction of Negative Activation (RA-NMT): R = .564, p[df = 5;33, F = 3.076] = .022 (*f* = 0.68) (UR: F = 2.980; p = .026); (*f* = 0.10: small effect; *f* = 0.25: medium effect; *f* = 0.40: large effect) ((*): p ≤ .09; *: p ≤ .05); (UR: unstandardized residuals according to unstandardized residual analysis without influence of gender and age) (RX = Relaxation; AM = Arousal Modulation).

neuroticism playing a central role. Likewise, in patients without MT, low ego-strength was associated with reduced UofM.

These results suggest that MT helps to recognize and to improve patients' self-sufficiency resources and to use music as an important medium for emotion modulation, especially for cognitive processing. This could ultimately reflect the effect of a conscious approach to music promoted through music therapy. In other words, MT patients were able to deal with music in everyday life and use it more consciously and specifically than NMT patients. In previous investigations, low ego-strength was seen as an indication for the need of psychoeducation in handling music media.[9,41]

Ad 4) The change of UofM through MT might have an impact on the self-image

These findings support the self concept theory of personality: Personality dimensions lead to the development of emotion modulation strategies[10,12] and MT may lead to a change of personality dimensions. Due to the ubiquity of music MT may initiate emotion modulation processes which continue to develop even after completion of MT.[49] This is equivalent to a sustainable transformation process of the self-image during a therapeutic process.[59] According to Kreutz[60] musical behaviors in combination with context variables (such as the characteristics of where and how the musical intervention is delivered) evoke self-regulatory processes at conscious and/or subconscious levels, that exert a health promoting impact. And, psychotherapeutically speaking, through a transformation of emotional key situations in biography dysfunctional cognitive-emotional schemes may be mobilized, enabling a more mindful access to currently desirable emotions.[59]

Thus, the development of adaptive personality-specific UofM patterns through the use of MT and the suspected subsequent feedback effect on the personality structure, which reflects a genuinely therapeutic element, is perhaps the most remarkable point of this interim analysis. This self-reflexivity on the patient's personality is likely to enable sustainable therapeutic effects. In addition to a clinical point of view, an almost philosophical perspective seems to emerge: Beyond the more or less static side of the human personality, a dynamic dimension seems to emerge, that actively interacts with the environment. Of course, this last-mentioned model of thinking is a construct that could well be deduced from the results mentioned above, but which can not be proven on the basis of the available data: on the basis of the applied statistics, only reliable predictive statements of personality dimensions on UofM patterns can be done, not vice versa.

An important prerequisite for mental health is the integration of emotion modulation strategies (including UofM) within a frame of self-consciousness or self-perception, resulting in a predictable self-image. In mental illness this self-image may not be congruent and not sufficiently perceivable for the person as a self-structure that integrates all aspects of the personality into one whole (see e.g. Rudolf[61]). This condition prevents the development and integration of strategies that ensure long-term and secure emotion modulation.[59] Accordingly, an insufficiently integrated self is bound to have an impact on strategies that utilize the effect of music as a strong emotion-modulating stimulus. Whilst an increased UofM can be found in patients with more severe mental disorders,[14] these patients often recognize UofM as a tremendously helpful resource for coping with their condition.[41] Increasing the intensity of UofM is a much simpler intervention for the patient than modifying the self-image in a more elaborate way with the aim of improving emotion modulation. Thus, these results also support the mediator hypothesis,[10–12,19] as the NMT patients are still in a mode of emotional arousal (quantitative change), whilst patients with MT bring about a (qualitative) change of affect modulation that interacts with changes in the self-structure, ultimately making the therapeutic effect of MT plausible.

4.2. Further considerations for clinical practice

These findings raise the question of which strategy is of the greater therapeutic benefit. One answer might be to change self-image first and then to acquire appropriate strategies (with or without the use of music). However, this is likely to be difficult, since self-confidence is lacking in these patients due to mental disorder. Therefore, a more promising approach could be improving self-image-oriented emotion modulation strategies by means of music. These emotion modulation strategies not only make negative (positive) emotions experienceable through the realization of the emotional impact, but also provide information about the self. The self can thus be perceived and experienced in the therapeutic process as "more realistic" ("Who am I momentarily and what is happening to me?"). This also leads to an indirect change in the self-concept/self-image, possibly contributing to improvement of health or prevention of disorder. Further studies could investigate the presumption of a long-term change of the self-image in the course of music therapy and a corresponding change of the UofM patterns.

Last but not least, MT can be expected to improve the patient's attitude to music as such. When music is attributed to a subjective, positive value, music is also experienced as more helpful,[41] which in turn has a therapeutic effect in the sense of self-efficacy. The emotion modulation approach using the UofM model provides a perspective to explain at least one particular mechanism of action of MT. If one even leaves out the use of music in everyday life and considers it just one strategy of many for emotion modulation, then the UofM approach could be considered one example of how MT works.

Thus, the main mechanism of action of MT could be understood in imparting emotion modulation strategies in relation to one's own self-image and its transformatory effect based on the individual's biography and current situation in life. This again supports the thesis of Silina et al[49] of a transfer effect of MT, in the sense of a continuing therapeutic development that goes beyond the actual music therapy.

4.3. Limitations and strengths

The cross-sectional design can be considered a limitation because longitudinal causal effects were not assessed. Randomized contolled trials on the effects of MT involving personality dimensions and emotion modulation processes are needed as well as studies on the long-term outcome of MT. Furthermore, the sample size (n = 137) of this interim analysis does not yet allow subgroup analyses, e.g. to diagnostic groups, what is expected for the final evaluation. Differences between the two subgroups MT vs. NMT were not statistically relevant.

One strength of this interim analysis is the first demonstration of MT effects on emotion modulation strategies and potentially indirectly on the self-image in patients with mental disorders in a routine clinical setting. The final evaluation of the entire sample, based on the preliminary results of this interim evaluation, gives rise to an even more differentiated analysis.

5. Conclusions

Direct therapeutic effects of music therapy as complementary therapy in the treatment of mental disorders are unchallenged. It is also known that the use of music can be helpful for emotion modulation in the everyday life of patients with mental disorders. If music therapy is applied, specific personality dimensions predict more targeted emotion modulation strategies. Whereas patients without music therapy simply "vent" their negative emotions (non-cognitive strategies), music therapy seems to help patients acquire more conscious emotion modulation techniques (cognitive-related strategies) by means of including their individual personality. And these evolved emotion modulation strategies could in turn help to transform the self-image into an adaptive (salutary) one.

Conflicts of interest and source of funding

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