


Evaluating a Treatment Manual for Music Therapy in Adult Outpatient Oncology Care

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Abstract

Music therapy is a prevalent treatment for people with a life-threatening illness, with inpatient oncology care being one of the most common fields of application. A recently published review on this topic shows that studies examining the effects of active music therapy treatments in an outpatient setting are still rare. Based on the Phase Model of Psychotherapy Outcome, a treatment manual has been developed for outpatient music therapy cancer care, consisting of 20 individual sessions. The aim of this study was to evaluate the effectiveness of the procedures of this manual by comparing prescores and postscores of 20 patients' self-reported general therapy outcome, quality of life, and subjective pain intensity ratings. Results show that the intervention led to a significant improvement on all 3 dependent measures. Effect sizes ranged from medium to large. The authors conclude that it is necessary to further expand outpatient cancer care in Germany and to integrate music therapy as an effective treatment into these areas.

Keywords

music therapy, treatment manual, cancer, oncology, quality of life

Introduction and Background

Each year, around 425 000 people in Germany are diagnosed with cancer.¹ While breast and bowel cancer are the most common types among women, men are most frequently affected by prostate, bowel, or lung cancer.¹ The mean age of onset is 69 years for both sexes. One of the most common oncological symptoms is pain. During the initial stage, already half of the patients report severe pain sensations.² Approximately 25% of all German oncology patients show symptoms of depression and anxiety, with the prevalence rising to 77% as the physical condition worsens.¹ Symptoms of pain, depression, and anxiety negatively affect cancer patients' quality of life. According to a survey, 30% of all cancer patients in Germany state that they are open-minded toward the use of complementary psychotherapy treatment.³ Although it is not possible to enhance length of life of patients with cancer by any psychotherapy treatment (including music therapy⁴), there is evidence that it is possible to improve their quality of life and reduce psychosocial distress.⁵⁻⁷ Meta-analytic findings indicate that the studies investigating the effects of psychosocial interventions on adult cancer patients' quality of life show medium effect sizes.⁸ Psycho-oncological care encompasses all stages of disease, ranging from diagnostics to palliative and terminal treatment.

Today, music therapy as an evidence-based approach is a complementary treatment commonly used in integrative oncology programs. Major aims are the facilitation of subjective

well-being and the improvement of quality of life by working on psychosocial, emotional, and spiritual needs in addition to physical ones.⁹ The effect of music on pain reduction has been a part of scientific research since the early 1960s¹⁰ and seems to be well examined¹¹ and evident^{12,13} today. In addition, music therapy in oncology care has shown the potential to treat other symptoms such as mood disturbances and anxiety¹⁴⁻¹⁶ as well as to improve patients' quality of life.^{4,17} Patients undergoing radiation therapy reported a decline in anxiety and treatment-related distress when they were offered the opportunity to listen to their preferred music in between the sessions, although these changes did not reach statistical significance in comparison with a control group.¹⁸ Live music led to positive changes in anxiety, fear, relaxation, and diastolic blood pressure in patients who went through chemotherapy treatment.¹⁹ In the context of end-of-life care, music therapy is used to effectively address spiritual needs, reduce anxiety, and facilitate

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communication.²⁰⁻²² Although a recently published Cochrane Review²³ included 30 trials that investigate the effects of music interventions on cancer populations, the majority of studies are restricted to passive listening to prerecorded music (ie, music medicine) or the use of merely receptive techniques. Only 5 studies^{19,24-27} were identified that examined the effects of a music therapy (live) intervention in an outpatient setting, with only one study²⁵ reporting the use of active improvisational techniques. This emphasis on reporting the use of nonactive treatments might be due to the difficulty of providing standard guidelines for a therapeutic process that encompasses both active and passive music therapy interventions.

Therefore, the aim of this study was to develop and evaluate a semi-standardized treatment manual that describes the procedural method and the corresponding music therapy techniques, with a focus on active participation of the patient in terms of improvisational techniques. The manual is supposed to provide standard guidelines while leaving some flexibility for each patient's individual needs.

Method

Participants

Study recruitment was carried out by physicians as well as via a public bulletin and information sessions at the Center for Pain Therapy and Palliative Medicine in Heidelberg. Patients who met the following inclusion criteria were referred to the Music Therapy Outpatient Clinic, where the intervention took place: (a) cancer diagnosis, (b) 18 years and older, (c) emotional and psychological distress caused by the disease, and (d) no primary psychiatric disorder.

Altogether, 30 patients were referred to the music therapy intervention during the whole period of time (27 women and 3 men). Five patients canceled their participation because of personal reasons; 3 had to drop out because of their declining physical state. Two patients had not yet completed the intervention by the time the study ended.

After accounting for attrition, 20 participants remained for inclusion, with a mean age of 53 (± 13) years, ranging from 19 to 79 years. The majority of patients was female ($n = 19$), only one man took part. Breast cancer was the most common diagnosis ($n = 14$). Two participants were diagnosed with ovary cancer and 4 had miscellaneous diagnoses.

Procedure

A quantitative study was designed to evaluate the effectiveness of the music therapy intervention on cancer patients' self-reported general therapy outcome, quality of life, and pain perception. In addition to their standard medical care, patients who were referred to music therapy took part in an intervention following the steps in a semi-structured treatment manual. Music therapy treatment, consisting of 20 sessions (50 minutes each) was provided to each patient individually on a weekly basis. Before the first session took place, a standard music therapy assessment was carried out, including an introduction to the

setting and methods of music therapy, information about data privacy protection, and an assessment about the patient's musical history and preferences. There were 3 different measuring times: pre (at the beginning of the first session), intermediate (after 10 sessions), and post (after 20 sessions). The sessions were provided by 3 independent music therapists (diploma in music therapy) who were not involved in the research process. Data were collected by one of the researchers over a time period of 3 years. The realization of the study and the intervention itself were approved by the ethical review committee of the SRH University Heidelberg.

Music Therapy Intervention

The intervention followed the steps of a semi-structured manual, which provided guidelines for the therapeutic process. Theoretically, the manual is based on the Phase Model of Psychotherapy Outcome,²⁸ the Model of Specific Music Therapy Factors,²⁹ and the concept of quality of life.

Although there are different conceptualizations for quality of life as a construct to be found in the literature, 4 underlying dimensions can be distinguished^{30,31}: "physical condition" (physical symptoms, vitality, and mobility), "psychological condition" (emotional, motivational, and cognitive aspects, eg, anxiety, depression, and excitability), "social network" (amount and quality of social contacts and feelings of belongingness) and "general functioning" (including work and private life). According to these dimensions, 4 specific areas of patients' needs are addressed within the manual (Table 1), combining musical and verbal elements: physical symptoms (eg, pain), anxiety, social contacts, and restrictions in daily routine.

The manual's 20 sessions are subdivided into 3 stages (Table 2), inspired by the Phase Model of Psychotherapy Outcome²⁸: "improvement of subjective well-being" (3 sessions), "reduction of symptomatic distress" (14 sessions), and "enhancement of life functioning" (3 sessions). The basic idea of this model is that progression into a later phase of treatment depends on whether progress has been made in the earlier phase. In Phase II ("reduction of symptomatic distress"), the different treatment foci outlined above (Table 1) are adapted to the patient's individual needs. According to Hillecke and Wilker's²⁹ Model of Specific Music Therapy Factors, music therapy generally has the potential to affect patients on the following dimensions: modulation of (a) attention, (b) emotion, (c) cognition, (d) behavior, and (e) communication. Table 2 shows the relationships hypothesized between certain therapy objectives, music therapy factors, and specific music therapy techniques for each of the 3 stages. Within this fixed framework, there is a flexibility to adapt the therapy to individual needs of the patient.

General therapy goals are the improvement of patients' quality of life and the reduction of pain and psychological distress. In order to achieve these goals, the following analytically oriented music therapy techniques were used in each stage of the treatment, if indicated. These techniques had been derived from years of clinical practice with patients with cancer and a review of the standard literature on

Table 1. Treatment Foci for Patients With Cancer

Dimension of Quality of Life ^{30,31}	Treatment Focus	Description
Physical	Physical symptoms (eg, pain, sleep disorder, and fatigue)	Somatic disorders are a common consequence of operation, irradiation or chemotherapy, and a persistent by-product of each disease, affecting subjective experience and behavior of the patient; depending on the intensity, they can evoke or reinforce depression and anxiety and have an influence on the patient's social environment
Psychological	Anxiety	Because of their disease, patients often face feelings of anxiety, which makes them vulnerable and insecure; most frequently, patients are afraid of pain, about the progression of their disease, and of dying
Social	Social contacts	In most cases, the patient's disease is a burden for the whole social environment, especially for family and friends; such difficulties can harm the patients' self-esteem and lead to insecurity and isolation
Functional	Restrictions in daily routine	Cancer diagnosis causes drastic personal changes in patients' everyday life, including restrictions of hobbies and private life

Table 2. Treatment Manual

Treatment Stages	Therapy Objectives	Music Therapy Factors (Modulation of . . .)	Music Therapy Technique
Phase I: Improvement of subjective well-being (3 sessions)	Building a therapeutic relationship Introduction to setting and instruments Improvement of well-being	Attention Emotion	Receptive musical stimulation
Phase II: Reduction of symptomatic distress (14 sessions)	Reduction of psychosomatic symptoms, such as pain, sleeping disorders, fatigue Reduction of anxiety Social relationships: improvement of communication with significant others Identification of restrictions in everyday life	Attention Emotion Behavior Cognition Communication	Symptom improvisation Ritualized improvisation Supporting improvisation Reality improvisation Daydream improvisation
Phase III: Enhancement of life functioning (3 sessions)	Proving adequate nonverbal forms of interaction Stabilization of achievement Transfer to everyday life Detaching from therapist	Behavior Communication Emotion Cognition	Ritualized improvisation Reality improvisation Supporting improvisation Musical self-portrait

improvisation models of music therapy^{32,33} and are outlined below. Corresponding techniques previously described in the literature and based on similar principles are presented for better theoretical foundation. Results of a previous study on patients with chronic pain gave reason to believe that these techniques might be effective in relieving pain and reducing psychological distress.³⁴

Receptive musical stimulation. Within the assessment, associative resources of the patient, such as memories of well-being, are explored. Based on these associations, the therapist accompanies the patient on a musically supported, imaginary journey

by playing smooth and relaxing sounds, for example, on the vibraphone or piano. This technique releases positive memories and relaxation, and thus, aims at improving subjective well-being (corresponding technique: "free associating"³³).

Symptom improvisation. The patient is asked to express specific aspects of his experience of psychosomatic distress, such as pain and anxiety, by the means of music. This active examination can lead to a reduction of symptoms, if the patient experiences a dynamic and cathartic change in his affliction. The technique is effective through musically reproducing the symptoms and providing the patient with

improved coping strategies as well as the feeling of regaining control (corresponding technique: “contrasting”³³).

Supporting improvisation. The therapist provides a musical foundation by playing open sounds instead of harmonic chords and cadences. This enables the patient to improvise freely and thus develop different emotions and experiences. Through this technique, the expression of feelings is facilitated and an emotional activation is achieved (corresponding technique: “empathic improvisation and reflecting”³²).

Reality improvisation. Patient and therapist are transferring problematic everyday life situations connected with the patient’s symptoms to a music-based role play. Alternatives to existing stereotype behaviors are explored and tested. Reality improvisations aim at a reduction of social strain and the transferability of therapeutic progress to everyday life situations (corresponding technique: “transferring, role-taking”³³).

Daydream improvisation. Patient and therapist are exploring a certain feeling, picture, or memory in a verbal assessment, which provides the basis for a free improvisation. The therapist is picking up and repeating sounds played by the patient (including structures and figures) and is breaking up chords and rhythms. Ongoing imaginations during the play lead to an increased flexibility in the patient’s cognition and emotions (corresponding technique: “projecting, fantasizing”³³).

Ritualized improvisation. A verbal assessment is conducted in order to define rules for repeated, ritualized improvisational forms. With the help of these rituals, the patient is supposed to learn new ways of behavior and to transform negative cognitive patterns into positive ones. This self-directed adoption of alternative behaviors is supposed to enhance the patient’s general level of functioning (corresponding technique: “integrating”³³).

Musical self-portrait. The patient is allocating different aspects of his own personality to different musical instruments and plays them in a solo. Strengths and weaknesses of the patient are addressed and self-perception is improved, which also aims at an enhancement of general functioning.

Dependent Measures

Three different measurement tools were used to evaluate the effectiveness of the procedure. First, a German translation of the Outcome Questionnaire (OQ-45) was used for a general evaluation of therapy outcome.³⁵ Forty-five items are divided into the subscales “symptomatic distress,” “interpersonal relationships,” and “social integration.” Cronbach $\alpha = .93$ and a test-retest correlation of $R = .88$ indicate high reliability. The aggregate overall score is used as a criterion. Its grand mean in the German population is reported to be 46.2 (± 18.5).³⁶ Lower scores indicate a better therapy outcome. Second, quality of life was measured by the

Table 3. Reliable Change Indices and Cut-Off Values

Measure	Reliable Change	Cut-Off Value
Overall therapy outcome (OQ-45)	± 21	59
Global quality of life (EORTC-QLQ-C30)	± 8.8	70
Pain within past 4 days (VAS)	± 20	33

Abbreviations: OQ, Outcome Questionnaire; VAS, visual analog scale; EORTC-QLQ, European Organization for Research and Treatment of Cancer Quality of Life Questionnaire.

European Organization for Research and Treatment of Cancer Quality of Life Questionnaire C30 (EORTC QLQ-C30).³⁷ The questionnaire consists of 30 items and is validated for populations of patients with cancer. The EORTC QLQ-C30 is reported to have high reliability (Cronbach $\alpha = .89$; retest $R = .84$). The scale “general quality of life” was used as a criterion in this study. The grand mean in the general German population is 70.8 (± 22.1).³⁸ Higher scores indicate a better outcome. Third, a visual analog scale (VAS) ranging from 0 (no pain) to 100 (worst pain possible) was used to measure participants’ perception of the average pain intensity within the last 4 days.

Statistical Analysis

Data were analyzed using 2-tailed paired t tests ($\alpha = .05$) for pre-intermediate and pre-post comparisons, respectively, on each of the 3 measures. Effect sizes were calculated using the formula for dependent t tests of the “Effect Size Determination Program” provided by Lipsey and Wilson.³⁹

As common statistical tests are often criticized for drawing inferences only on a group level (due to statistical aggregation) as well as for lacking relevance for clinical practice, Jacobson and Truax⁴⁰ suggested different approaches to defining meaningful change in clinical research. Hence, 2 methods of operationalizing meaningful change were used in this study: by use of reliable change indices and by defining cut-off values for clinically significant change.⁴⁰ The first method is based on the concept of critical difference. Reliable change constitutes a statistically significant difference on an individual level, indicating whether change reflects more than just the fluctuation of an imprecise instrument.⁴⁰ The second method refers to whether a patient crosses a certain cut-off value that distinguishes between healthy and nonhealthy populations, as a consequence of the therapy process.⁴⁰ Reliable change indices and cut-off values for each instrument are presented in Table 3.^{34,36,38}

Case Study

A case study is presented in order to illustrate the findings and to give the reader a clearer impression of the therapeutic process. The descriptions in the case study represent the clinical memory and the subjective perceptions of the therapist who provided the sessions.

Table 4. Results for Comparisons of Prescores and Intermediate Scores (After 10 Weeks)

Measure	N	MD (SD)	CI (95%)	SMD	t	P
Overall therapy outcome (OQ-45)	20	-7.5 (16.7)	-15.2, 0.3	-0.30	-2.00	.060
Global quality of life (EORTC-QLQ-C30)	19	8.7 (23.2)	-2.4, 19.9	0.43	1.65	.116
Pain within past 4 days (VAS)	17	-7.4 (20.8)	-18.1, 3.4	-0.31	-1.45	.165

Abbreviations: OQ, Outcome Questionnaire; VAS, visual analog scale; EORTC-QLQ, European Organization for Research and Treatment of Cancer Quality of Life Questionnaire; MD, mean difference; SD, standard deviation; CI, confidence interval; SMD, standardized mean difference.

Table 5. Results for Comparisons of Prescores and Postscores (After 20 Weeks)

Measure	N	MD (SD)	CI (95%)	SMD	t	P
Overall therapy outcome (OQ-45)	20	-12.1 (15.5)	-19.3, -4.9	-0.46	-3.5	.002 ^a
Global quality of life (EORTC-QLQ-C30)	19	18.9 (15.9)	11.2, 26.5	1.04	5.16	.000 ^a
Pain within past 4 days (VAS)	17	-12.1 (20.8)	-22.7, -1.4	-0.52	-2.39	.029 ^a

Abbreviations: OQ, Outcome Questionnaire; VAS, visual analog scale; EORTC-QLQ, European Organization for Research and Treatment of Cancer Quality of Life Questionnaire; MD, mean difference; SD, standard deviation; CI, confidence interval; SMD, standardized mean difference.

^aStatistically significant difference ($\alpha = .05$).

Hypothesis

The alternative hypotheses for the study state there will be a significant difference between premeasures and postmeasures on patients' self-reported general therapy outcome (OQ-45), quality of life (EORTC QLQ-C30), and pain perception (VAS).

Results

From 20 participants who started the study, some data were missing at later time points, leaving $n = 20$ for the final analysis of general therapy outcome (OQ-45), $n = 19$ on the quality-of-life measure (EORTC QLQ-C30), and $n = 17$ for the assessment of pain intensity (VAS).

Table 4 shows the mean differences and their associated 95% confidence intervals for prescores and intermediate scores (after 10 sessions), as well as the results of the corresponding 2-tailed paired t test. Although positive tendencies could be observed on all 3 variables, none of the differences reached statistical significance: therapy outcome (mean difference [MD] = -7.5; confidence interval [CI] = [-15.2, 0.3]; $P = .060$), quality of life (MD = 8.7; CI = [-2.4, 19.9]; $P = .116$), and pain perception (MD = -7.4; CI = [-18.1, 3.4]; $P = .165$). Effect sizes (standardized mean differences [SMDs]) ranged from small to medium⁴¹ at this point of the treatment.

However, changes on all 3 dependent measures reached statistical significance after completion of the whole intervention (pre-post comparison). Results of the corresponding t tests are presented in Table 5. The music therapy intervention following the treatment manual led to an improvement regarding general therapy outcome (MD = -12.1; CI = [-19.3, -4.9]; $P = .002$), quality of life (MD = 18.9; CI = [11.2, 26.5]; $P = .000$), and pain perception (MD = -12.1; CI = [-22.7, -1.4]; $P = .029$). As Table 5 indicates, effect sizes (SMD)

ranged from medium to large⁴¹ with music therapy having the strongest impact on the quality-of-life measure ($d = 1.04$).

Table 6 shows the results regarding reliable and clinically significant change. The improvements achieved by more than half of the participants (11 of 19) on the quality-of-life measure can be declared as being reliable changes, meaning that they reached significance on an individual level. Success rates for the criterion of clinically significant change were lower in general. Approximately, between one fourth and one fifth of all patients crossed a clinically relevant cut-off value on the 3 dependent measures, respectively. The results of one patient showed an aggravation regarding general therapy outcome (reliable change) and another patient's self-reported pain intensity was aggravated during the course of the intervention (both reliable and clinically significant change).

A Case Study

Background. Patient R is a 57-year-old female, divorced, and has 3 adult children. She works as a teacher in the apprenticeship department of a company. Six months ago, she was diagnosed with a tumor in her right breast, necessitating a lumpectomy. At the beginning of the music therapy treatment, she was still receiving chemotherapy treatment. The OQ-45 showed a moderately increased score for psychological distress (64). Measures of the EORTC-QLQ-C30 show that her global quality-of-life score was significantly below average (42). Her rating of subjective pain perception was 55 on a VAS. The patient described her situation as follows: she reported that her stress levels increased when she was surrounded by other people. Generally, she got the impression that her social environment was not supporting her sufficiently. Therefore, she preferred to stay on her own. She described the relationship with her partner as difficult. Ever since the onset of her illness she felt that she needed to take care of him instead of the other

Table 6. Percentage and Frequencies of Reliable Changes and Clinically Significant Changes

Measure	N	Aggravation	No Change	Improvement
Reliable change				
Overall therapy outcome (OQ-45)	20	0% (0)	75% (15)	25% (5)
Global quality of life (EORTC-QLQ-C30)	19	0% (0)	42% (8)	58% (11)
Pain within past 4 days (VAS)	17	6% (1)	65% (11)	29% (5)
Clinically Significant Change				
Overall therapy outcome (OQ-45)	20	5% (1)	75% (15)	20% (4)
Global quality of life (EORTC-QLQ-C30)	19	0% (0)	74% (14)	26% (5)
Pain within past 4 days (VAS)	17	6% (1)	76% (13)	18% (3)

Abbreviations: OQ, Outcome Questionnaire; VAS, visual analog scale; EORTC-QLQ, European Organization for Research and Treatment of Cancer Quality of Life Questionnaire.

way round. This situation led her into thinking about ending the relationship. As a consequence of the exhausting chemotherapy, she felt a burning pain in her hands and feet and slept a lot. Small changes in her physical state were sufficient to cause feelings of existential fear and anxiety. The music therapy assessment showed that the patient was well-connected to music. She described a comfortable body feeling after the first receptive stimulation. She enjoyed the active exercise on the vibraphone, which brightened up her mood.

Phase I. The therapist observed that she succeeded very quickly in relaxing and finding access to pleasant memories. While listening to music, the pain sensation decreased and a comfortable feeling spread out and lasted for an entire session. At the end of the first treatment phase, she made the decision to separate from her partner.

Phase II. During the symptom improvisation intervention, the therapist got the impression that the patient learned how to express her pain better and how to deal with it. Most of the time, she chose a gong or kettledrum as her instrument, because these instruments seemed to allow her to express her anger. At the beginning of the second phase, anger was the dominant topic. First, she was angry about her pain. Second, she was frustrated about the social contacts with friends and family. She mentioned that she was missing openness of other people toward herself and her disease but that she was not feeling angry about the disease itself. Additionally, fears about the effectiveness of her medical treatments and about an aggravation of pain were ubiquitous. To help her handle those feelings, supporting improvisations concerning anger and fear were offered. The vibraphone, the monochord, and the piano were her favorite instruments for these improvisations. The therapist was accompanying and supporting her on the piano most of the time. It was hard for her to verbally admit feelings of anxiety, fear, and anger and to express her emotions. Within the therapeutic process, she seemed to learn how to integrate those feelings into her self-concept and how to develop more flexible patterns of behavior. The emotional activation provoked a change in her social relationships. In the context of reality improvisations, she practiced to get in touch and argue with others. At the end of this stage, she

stated that she was able to be around people more often as well as to stay alone if she was not in the right mood of socializing.

Phase III. Because of a general improvement in her physical and psychological state, the patient began to visit concerts again. She started taking part in an arts and percussion course. Questioning her reentry to work bothered her a lot. On one hand, she said, she would prefer to work only once a week, but on the other hand, she struggled with financial issues that forced her to work more often. Within ritualized improvisations, she learned how to deal with that pressure and how to alter it to a more pleasant feeling. The patient chose a monochord for these improvisations and the therapist accompanied her on the piano, strictly following set-up rules. She said, she realized that she generally enjoyed her job as a teacher and working with people. At the end of her treatment, the joint achievements were reflected and expressed in a musical self-portrait where she allegorized her strengths and weakness musically. She mentioned that developing coping strategies for dealing with her emotions had been most helpful to her during the whole process. The therapist observed that she had learned how to better integrate her feelings, making it easier for her to approach others.

After the treatment, a clinically significant reduction of psychological distress was obtained ($OQ < 59$). The patient's global quality-of-life index reached an average level (67) and subjective pain intensity decreased to 30.

Discussion

This study examined the effectiveness of a music therapy intervention in outpatient cancer care. Overall, the outcome was positive. The effect size on patients' self-reported quality of life is comparable with those of other psychosocial treatments in the area of oncology care.⁸ Together with the analysis of reliable change, showing that 58% of the participants experienced a reliable improvement, these results indicate that the intervention is effective in improving cancer patients' quality of life. However, the effect on pain was rather moderate, possibly due to the physical state of the participants, who did not have a metastasizing carcinoma and therefore

no pain to make a special treatment necessary. Results for the different measurement times support the Phase Model of Psychotherapy Outcome,²⁸ which the construction of the treatment manual is based on. Ten sessions of music therapy were not sufficient to produce significant results, but already showed observable trends toward an improvement of patients' states.

The relatively low success rates for participants' improvement according to the criterion of clinically significant change might be due to the fact that this criterion does not compare patients' scores with a baseline level but with a fixed cut-off value that separates the population in terms of "healthy" versus "not healthy." As most researchers and clinicians would agree, this distinction is rather artificial and not always meaningful. Thus, some participants were included in this study, whose scores were greater than that of the cut-off level before commencement of the research, making it technically impossible for them to achieve a "clinically significant improvement." Additionally, Jacobson and Truax⁴⁰ found that, in general, clinical significance data makes a treatment look less effective than common statistical tests. However, what can be inferred from these results is that music therapy constitutes a low-risk treatment for cancer patients with only 2 patients showing an aggravation on one of the dependent measures.

It must be acknowledged that 3 patients dropped out before completion of the whole intervention because of a declining physical state. It is reasonable to assume that an inclusion of these participants might have led to less positive results, as one's physical condition is likely to have an influence on the dependent variables used in this study.

Another limitation of the study is the relatively small number of participants. Hence, generalizations to other populations can only be made with great carefulness. The lack of a control group is generally recognized as a threat to the internal validity of a study, thus making it impossible to rule out influences of external factors, such as extratherapeutic events, physical state, or medication, and to draw causal inferences. This methodological limitation also has to be considered when interpreting the relatively high effect sizes in this study as the lack of a control group might lead to an overestimation of the real effect.

This article adds to the body of research in the field of music therapy and oncology care. Quantitative studies using active treatments in an outpatient setting are rare and frequently lack reproducibility and detailed descriptions about the proceedings. Therefore, a semi-structured treatment manual is presented as a solution, offering a general framework of guidelines while leaving some flexibility for individual developments at the same time. Together with the presentation of a case study, it is hoped to provide the reader with an impression of what happened within the therapeutic process. The quantitative results are promising, showing that the music therapy treatment manual is effective in improving cancer patients' self-reported quality of life and pain perception as well as the general therapy outcome. Future research

should try to replicate these findings in a controlled trial and with a larger sample size.

These results are highly relevant in context of an extension of outpatient oncology care. Still, there is a lack of care centers available for both adjuvant treatment and after treatment support in Germany. We hope that this study contributes to the public request for scientific evaluation of complementary therapies in integrative oncology.

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