

Full-Length Article

Music Therapy and Music Medicine Studies in Oncology: Part I: A Comparison**Barbara L. Wheeler¹, Teresa L. Lesiuk², Debra S. Burns³, Suzanne B. Hanser⁴, Andrew Rossetti⁵, Michael D. Cassity⁶**¹Montclair State University, United States of America²University of Miami, United States of America³Indiana University-Purdue University Indianapolis, United States of America⁴Berklee College of Music, United States of America⁵Mount Sinai Beth Israel, United States of America⁶Southwestern Oklahoma State University, United States of America**Abstract**

Music medicine studies and music therapy studies in oncology are compared in this research article. The intent is to see whether music therapy research differs from music medicine research and, if so, articulate the differences. The studies referred to in this paper might be useful in highlighting the strong points of each type of practice. 9 music therapy and 8 music medicine quantitative or mixed methods studies were selected as exemplary studies in both areas, using a Delphi process. Studies were then examined and compared regarding number of participants; independent and dependent variables; measures used; findings; number, duration, and frequency of sessions; number of participants; presentation of music; number and length of sessions; whether intervention content and an intervention theory were provided; whether music therapists were included as authors; the types of journals in which articles were published; areas of intervention; and whether CONSORT guidelines were followed. Similarities and differences are discussed, as are implications for research and practice.

Keywords: *Music therapy, music medicine, oncology, research, palliative care, supportive care*

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Music therapy and music medicine are 2 of 5 categories of practice utilizing music for the purpose of evoking client responses and are presented in a model by Dileo [1]. Music therapy, one of the five areas, is “a systematic process of intervention wherein the therapist helps the client to promote health, using music experiences and the relationships that develop through them as dynamic forces of change” [2] (p. 20). Dileo [1] states:

Music therapy is used in a wide range of medical specialty areas and also in diverse nonmedical areas. Music therapy goals may be physical, psychological, spiritual, cognitive, developmental, and/or social in nature. Music therapy is distinguished from other practices involving music in the following ways: (1) its

use of a therapeutic process of assessment, treatment, and evaluation, (2) the range of musical experiences offered to the patient, and (3) the relationship with the patient that evolves through the music. (p. 114)

Spingte and Droh first spoke of music medicine in 1992, stating:

MusicMedicine is the scientific evaluation of music; stimuli in medical settings, especially through mathematical, physical, psychological and medical research as well as therapeutic application in order to complement traditional medical treatment with regard to the particular illness, medication and procedures involved in each individual case. [3]

More recently, regarding “music practices by medical staff,” Dileo [1] states:

Music medicine (... or music in medicine) refers to the use of music by medical personnel to reduce anxiety, pain, and autonomic reactivity and improve the status and well-being of medical patients. Typically, prerecorded music is used,

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and this music is chosen either by the medical professional or by the patient who selects music from a variety offered according to preference. Although it is possible that a relationship exists between these two persons, this relationship does not evolve through the music experience but has its basis in the medical care provided. (p. 113)

Distinctions as to the type of research practice are not always made by those who refer to and research music therapy and music medicine. In numerous studies of both music therapy and music medicine, the lack of appropriate identification of music therapy or music medicine interventions leads to confusion amongst those reading and attempting to translate research findings to clinical practice. For example, authors dilute the importance of the therapeutic relationship within music therapy when they refer to music medicine as music therapy [4]. More broadly, when creative arts therapies are not properly defined and delineated from other arts-based interventions within systematic reviews, the findings are potentially meaningless [5].

To explore the importance of the therapeutic relationship, Bradt et al. [6] compared a music therapy versus a music medicine intervention on psychological outcomes and pain in patients diagnosed with cancer. Their mixed methods design embedded qualitative data within a randomized cross-over trial. Thirty-one adult cancer patients participated in two music therapy sessions that involved interactive music making with a music therapist and two music medicine sessions in which they listened to pre-recorded music without the presence of a therapist. Quantitative measures indicated that the interventions were equally effective in enhancing the target outcomes. However, the mixed methods analysis revealed different treatment benefits based on patient experiences with each intervention (i.e., the patients described the importance of the therapist). Thus, the addition of qualitative data within this study provided additional evidence to assist clinicians in translating research results to practice. Furthermore, the clear description of each intervention allowed for more depth analysis of outcomes and patient experience.

Gold [7] suggested differences in methodologies employed in music therapy and music medicine research, stating: “In music therapy there seems to be a predominance of case studies and qualitative and theoretical research, in music medicine a predominance of randomized controlled trials” (p. 1). To gather information as to whether Gold’s [7] assessment of the different methodologies was accurate, Wheeler [8] reviewed and compared oncology studies in music therapy and music medicine. She searched databases and other resources beginning in 2000 and classified studies into music therapy or music medicine, using Bruscia’s [2] definition of music therapy and Dileo’s [9] definition of music

medicine. She found 23 quantitative music therapy studies including 11 RCTs, 2 qualitative studies (one of which was a mixed methods study with a strong qualitative strand), and 10 additional mixed methods studies that were primarily quantitative with qualitative strands. She identified 16 quantitative music medicine studies, 14 of which were RCTs, and one qualitative music medicine study.

Questions of differences in methodologies for music therapy and music medicine research guided the present study. Do music therapy and music medicine research differ and, if so, in what ways? What is the impact of the music interventions on patient outcomes chosen by music therapy and music medicine researchers? The current study was conducted with the assumption that an examination of these questions could contribute to the rigor of research in both music therapy and music medicine. Oncology was chosen as a medical area of significance in which a number of well-designed, published studies exist and in which both music therapists and those practicing music medicine have had substantial contributions. Therefore, the aim of this paper is to describe and delineate the music interventions, the outcome variables, and findings of select music therapy and music medicine studies.

Method

An extensive search for research articles in 2 different music research practices (i.e., music therapy and music medicine) was performed by the first author, with the intent of having a sufficient number of quality research studies in both areas for the purpose of comparing research and practice trends. Databases accessed included: PubMed/Medline, PsycInfo, EBSCO, Cochrane database, and Google Scholar. Other influential sources consulted included a Cochrane study that examined music interventions for improving psychological and physical outcomes in cancer patients [10], along with various other review articles.

Oncology was selected as a medical area in which each research practice has had success and reported quality work. Published research studies in oncology were limited to the years 2000 through 2016 and were written in English. No limitations were placed on oncology specialties, nor was there any particular area of focus, so music studies occurring during disease-directed treatment, off treatment, and comfort care were all considered. The intent was to identify research that would allow evaluation and comparison of the research in music therapy and music medicine. The first author began by evaluating the articles to determine those that would be reviewed. Only quantitative and mixed methods studies were included in order to focus on the research methodology of each study. This process led to 26 music therapy and 19 music medicine studies in oncology identified for review. See Table 1 for a list of the studies reviewed and those included in the final analysis.

A research process, the Delphi Technique, was followed and involved several evaluators ranking the oncology studies. The Delphi technique and process used for this paper is described elsewhere [11, 12]. Delphi panelists, comprised of four music therapists, evaluated 26 music therapy and 19 music medicine studies. They then chose nine exemplar music therapy and eight exemplar music medicine studies and ranked them from highest to lowest quality within the appropriate category. The exemplar studies were further evaluated by the first author using CONSORT Guidelines [13]

(or other appropriate guidelines). While the panelists involved in the Delphi study sorted and ranked the research studies for both music therapy and music medicine, they did so without an assigned rubric. In other words, being considered expert in their respective areas, they were given the freedom to rank and comment openly about the quality of the research studies. The expert panel continued their contribution to the research through involvement in all later decisions about the study and writing the article; they are included as coauthors of this article.

Table 1. Studies Included

Music Therapy		
Author(s)	Date	Title
Burns Azzouz, et al. [14]	2008	Music imagery for adults with acute leukemia in protective environments: A feasibility study
Burns Robb, et al. [15]	2009	Exploring the feasibility of a therapeutic music video intervention in adolescents and young adults during stem-cell transplantation
Burns Perkins, et al. [16]	2015	Music therapy is associated with family perception of more spiritual support and decreased breathing problems in cancer patients receiving hospice care
Clark Isaacks-Downton, et al. [17]	2006	Use of preferred music to reduce emotional distress and symptom activity during radiation therapy
Gutgsell Schluchter, et al. [18]	2013	Music therapy reduces pain in palliative care patients: A randomized controlled trial
Hilliard [19]	2003	The effects of music therapy on the quality and length of life of people diagnosed with terminal cancer
Palmer Lane, et al. [20]	2015	Effects of music therapy on anesthesia requirements and anxiety in women undergoing ambulatory breast surgery for cancer diagnosis and treatment: A randomized controlled trial
Robb Clair, et al. [21]	2008	A non-randomized controlled trial of the active music engagement (AME) intervention on children with cancer
Robb Burns, et al. [22]	2014	Randomized clinical trial of therapeutic music video intervention for resilience outcomes in adolescents/young adults undergoing hematopoietic stem cell transplant: A report from the Children's Oncology Group
Additional studies considered but not included in the final list selected as exemplary:		
Cassileth BR, Vickers AJ. Music therapy for mood disturbance during hospitalization for autologous stem cell transplantation: A randomized controlled trial. 2003 [23]		
Chaput-McGovern J, Silverman MJ. Effects of music therapy with patients on a post-surgical oncology unit: A pilot study determining maintenance of immediate gains. 2012 [24]		
Chuang CY, Han WR. Effect of long-term music therapy intervention on autonomic function in anthracycline-treated breast cancer patients. 2011 [25]		
Chuang CY, Han WR. Effects of music therapy on subjective sensations and heart rate variability in treated cancer survivors: A pilot study. 2010 [26]		
Cook EL, Silverman, MJ. Effects of music therapy on spirituality with patients on a medical oncology/hematology unit: A mixed-methods approach. 2013 [27]		
Domingo J, Matamoros N. Effectiveness of music therapy in advanced cancer patients admitted to a palliative care unit: A non-randomized controlled, clinical trial. 2015 [28]		
Dvorak A. Music therapy support groups for cancer patients and caregivers: A mixed-methods approach. 2015 [29]		
Ferrer AJ. The effect of live music on decreasing anxiety in patients undergoing chemotherapy treatment. 2007 [30]		
Gallagher LM, Lagman R. The clinical effects of music therapy in palliative medicine. 2006 [31]		
Gimeno MM. The effect of music and imagery to induce relaxation and reduce nausea and emesis in patients with cancer undergoing chemotherapy treatment. 2010 [32]		
Hanser SB, Bauer-Wu, S. Effects of a music therapy intervention on quality of life and distress in women with metastatic breast cancer. 2006 [33]		
Horne-Thompson, A, Grocke D. The effect of music therapy on anxiety in patients who are terminally ill. 2008 [34]		

Lin MF, Hsieh YJ. A randomised controlled trial of the effect of music therapy and verbal relaxation on chemotherapy-induced anxiety. 2017 [35]
 Romito F, Lagattolla F. Music therapy and emotional expression during chemotherapy: How do breast cancer patients feel? 2013 [36]

Music Medicine

Chi Young, et al* [37]	2015	Effects of music relaxation video on pain and anxiety for women with gynaecological cancer receiving intracavitary brachytherapy: A randomised controlled trial
Danhauer Vishnevsky, et al. [38]	2010	Music for patients with hematological malignancies undergoing bone marrow biopsy: A randomized controlled study of anxiety, perceived pain, and patient satisfaction.
Eckhouse Hurd, et al* [39]	2014	A randomized controlled trial to determine the effects of music and relaxation interventions on perceived anxiety in hospitalized patients receiving orthopaedic or cancer treatment
Huang Good, et al [40]	2010	The effectiveness of music in relieving pain in cancer patients: A randomized controlled trial
Jeppesen Pedersen, et al [41]	2016	Music does not alter anxiety in patients with suspected lung cancer undergoing bronchoscopy: A randomised controlled trial
Kwekkeboom [42]	2003	Music versus distraction for procedural pain and anxiety in patients with cancer
The following three were considered as one study:		
Li Yan, et al [43]	2011	Effects of music therapy on pain among female breast cancer patients after radical mastectomy: Results from a randomized controlled trial
Li Zhou, et al [44]	2011	Effects of music therapy on anxiety of patients with breast cancer after radical mastectomy: A randomized clinical trial
Zhou Li, et al [45]	2011	Effects of music therapy on depression and duration of hospital stay of breast cancer patients after radical mastectomy
O'Callaghan Sproston, et al* [46]	2012	Effect of self-selected music on adults' anxiety and subjective experiences during initial radiotherapy treatment: A randomised controlled trial and qualitative research

Additional studies considered but not included in the final list selected as exemplary:

Bulfone T, Quattrin R. Effectiveness of music therapy for anxiety reduction in women with breast cancer in chemotherapy treatment. 2009 [47]
 Burrai F, Micheluzzi V. Effects of live sax music on various physiological parameters, pain level, and mood level in cancer patients: A randomized controlled trial. 2014 [48]
 Huang, S, Good M. Music reduced cancer pain via relaxation and distraction. 2007 [49]
 Jasemi M, Aazami S. The Effects of music therapy on anxiety and depression of cancer patients. 2016 [50]
 Lai WS. Efficacy of guided imagery with theta music for advanced cancer patients with dyspnea: A pilot study. 2010 [51]
 Liao J, Yang Y. Effect of Chinese medicine five-element music on the quality of life for cancer patients: A randomized controlled trial. 2013 [52]
 Nguyen TN, Nilsson S. Music therapy to reduce pain and anxiety in children with cancer undergoing lumbar puncture: A randomized clinical trial. 2010 [53]
 Smith M, Casey L. Music as a therapeutic intervention for anxiety in patients receiving radiation therapy. 2001 [54]
 Vachiramon V, Sobanko JF. Music reduces patient anxiety during Mohs surgery: An open-label randomized controlled trial. 2013 [55]

*Three studies for which authors include music therapists are classified as music medicine because the intervention (as described) did not include any interaction or relationship with the music therapist, thus meeting the definition of a music medicine intervention.

Results

Comparison of Selected Studies

The focus of this study was to determine whether music therapy research differs from music medicine research and, if so, in what ways. The analyses were based on comparisons of the nine music therapy and eight music medicine articles selected by the expert panel as quality examples of quantitative or mixed methods research in oncology. Most ($n = 15$) of the studies were randomized controlled trials (RCTs). There were two exceptions to this, both music therapy studies. One study

[21], a non-randomized controlled trial, was treated as a rigorous quantitative design for evaluative purposes. The other [16] was a retrospective, propensity score analysis of electronic medical records.

Comparison of Results

The results of the studies were compared, including the number of participants, independent and dependent variables, measures used, and findings. These are summarized in Table 2.

Table 2. Number of Participants, Population, Independent and Dependent Variables, Measures Used, and Findings*

Author(s)	N	Popula-tion	Independent Variables	Dependent Variables	Measures Used	Findings
Music Therapy						
Burns Azzouz, et al, 2008 [14]	49	Adults with acute leukemia or high grade, non-Hodgkins' lymphoma	Music imagery provided by MT-BC vs. standard care	Feasibility: agree to sessions, complete sessions, complete questions at assessments; efficacy: positive and negative affect, fatigue, anxiety	Positive Affect and Negative Affect Schedule (PANAS); Functional Assessment of Chronic Illness Therapy —Fatigue scale (FACIT-F); self-report questionnaire	Feasibility measures were adequate; all improved on efficacy measures, with a subgroup with low baseline negative affect who received the intervention reported significantly less anxiety at discharge than individuals with low baseline negative affect who did not receive the intervention
Burns Robb, et al, 2009 [15]	12	Adolescents and young adults undergoing stem-cell transplantation	Therapeutic music video (TMV) vs. audio-book	Feasibility and preliminary efficacy of TMV	Measures were based on the Resilience in Illness model [56, 57]; used 15 measures (including Spielberg).	Consent rate, session and questionnaire completion supported feasibility. Positive trends found for several psychosocial measures (e.g., hope, mastery, spirituality, symptom distress)
Clark Isaacks-Downton, et al, 2006 [17]	63	Patients undergoing curative radiation therapy	Patient-preferred music for relaxation or distraction vs. control	Anxiety, depression, treatment-related distress, fatigue, pain	NRS; Hospital Anxiety & Depression Scale (HAD); Profile of Mood States (POMS) Fatigue; self-report questionnaire	No significant differences between groups for depression, fatigue, and pain. Significant difference in treatment-related distress for music condition. Higher use of music correlated with greater decline of treatment-related distress.
Gutgsell Schluchter, et al, 2013 [18]	200	Patients in palliative care	MT-guided relaxation and live music vs. control	Self-report pain and observer-reported pain of patient (i.e., in face, legs, activity, cry, and consolability)	NRS; Face, Legs, Activity, Cry, Consolability Scale (FLACC); Functional Pain Scale (FPS)	Significantly reduced self-reported pain for the music condition. No significant difference in observer-reported pain of patient.
Hilliard, 2003 [19]	80	Patients with terminal cancer in hospice care	Clinical music therapy vs. standard care	Quality of life and nurse-observed functional status of patients	Hospice Quality of Life Index-Revised (HQLI-R); Palliative Performance Scale (PPS); length of life	Significantly greater self-reported quality of life for music condition. Higher number of MT sessions produced greater quality of life.
Palmer Lane, et al, 2015 [20]	207	Women with breast cancer receiving surgery	Patient-selected live music (LM) with MT recorded music intraoperatively vs. patient-selected recorded music (RM) with MT recorded music intraoperatively vs. usual care	Anesthesia requirements, anxiety, recovery time, patient satisfaction	Global Anxiety-Visual Analog Scale (GA-VAS**); Bispectral Index (BIS; measures the effects of sedatives on the brain); recovery time; patient satisfaction with NRS	No significant difference in anesthesia requirements amongst conditions. Significant reduction in anxiety for the LM and RM preoperatively compared to usual care. No significant differences in recovery time and satisfaction amongst groups. However, the LM group had a shorter recovery time than the RM.

Robb Clair, et al, 2008 [21]	83	Children with cancer	Active music engagement (AME) vs. two controls; music listening (ML) and audio storybooks (ASB)	Coping behaviors (i.e., positive affect, active engagement, initiation)	Behavioral coding form looking at facial affect, active engagement, and initiation (time sampling)	Significantly higher behaviors for the AME group compared to the ML and ASB groups. Significantly higher positive affect and active engagement for the AME compared to ML and ASB and AME significantly higher in initiation than ASB.
Robb Burns, et al, 2014 [22]	113	Adolescents/ young adults undergoing hematopoietic stem cell transplant	Therapeutic music video vs. control (audio-book)	Spiritual perspective, social integration, family environment, courageous coping, hope-derived meaning; illness-related distress, defensive coping, self-transcendence, resilience	Utilized measures based on the Resilience in Illness model [56, 57]; 20 measures	At post-intervention, the TMV group reported significantly better courageous coping; at time 3, 100 days post-transplant, the TMV group reported significantly better social integration and family environment; moderate, but non-significant effect sizes for spiritual perspective and self-transcendence

Music Medicine

Chi Young, et al, 2015 [37]	60	Women with gynecological cancer undergoing surgery	Music relaxation video vs. standard care	Pain, opioid use, anxiety	pain severity with visual rating scale (VRS); opioid consumption with PCA pump; State Anxiety scale of STAI (Spielberger) Inventory	Significantly reduced pain and anxiety significantly for music condition, but not opioid intake for music or standard care
Danhauer Vishnevsky, et al., 2010 [38]	59	Patients undergoing bone marrow biopsies	Music vs. usual care	Pain, anxiety, patient satisfaction	Spielberger STAI, VAS (pain), patient satisfaction questions	Pain and anxiety not significantly reduced for either condition, but patient satisfaction higher for music group
Eckhouse Hurd, et al, 2014 [39]	112	Patients receiving initial orthopedic or cancer care	Music-focused relation vs. music video, vs. control	Anxiety	Spielberger State-Trait Anxiety Inventory	No significant differences amongst conditions; all groups significantly reduced anxiety post-intervention
Huang Good, et al, 2010 [40]	126	Patients with cancer pain	Music (given sedative choices) vs. no music	Pain	VAS	Significantly reduced posttest pain for music condition; large effect size
Jeppesen Pedersen, et al, 2016 [41]	160	Patients with suspected lung cancer undergoing bronchoscopy	MusiCure, music developed by a Danish composer, heard through earbuds vs. control	Anxiety; Secondary outcomes included p-cortisol, physiological variables, dosage of sedatives, movements, bronchoscopy duration, number of re-examinations, and overall perception of the sounds in the operating theatre	State-Trait Anxiety Inventory (STAI); secondary outcomes: p-cortisol, physiological variables, dosage of sedatives, movements, bronchoscopy duration, number of reexaminations, perception of noise in operating theatre	No significant effect of music when sex and baseline anxiety are accounted for; significantly more positive perception of sounds in the operating theatre and fewer re-examinations in the music group

Kwekke-boom, 2003 [42]	58	Patients with cancer having noxious medical procedures	Given music options vs. distraction as given book on tape selections vs. control	Pain, anxiety, perceived control over pain and anxiety	Pain intensity - numeric rating scale; state anxiety - STAI-S; perceived control over pain - number	No significant differences between music and distraction; some patients found music bothersome; preferred to focus on procedure and medical team
Li Yan, et al, 2011 [43]; Li Zhou, et al, 2011 [44]; Zhou Li, et al, 2011 [45]	120	Women with breast cancer following surgery and through-out chemotherapy	Music therapy (self-selected music from a music library created by a MT, musicologist and oncologist) vs. standard care	Pain; anxiety; depression	3 separate reports: pain (McGill Pain Questionnaire, includes VAS); anxiety (SAI - believe this is STAI); depression (Zung Self-Rating Depression Scale) and duration of stay	Significant decrease in pain, anxiety and depression for the music condition all 3 time points, immediately after surgery and 2 different chemotherapy time points; hospital stay after radical mastectomy was significantly shorter for music group
O'Callaghan, Sproston, et al, 2012 [46]	100	Patients with cancer undergoing first radiation treatment	Patient self-selected music vs. control	Anxiety, future use of music questionnaire	Spielberger State Anxiety Inventory; semi-structured Radiotherapy Experience Questionnaire (devised by authors) and included questions about music	Significant decrease in anxiety for both music and control group post-treatment; the music group had significantly higher desire for future use of music during treatment and reported feeling supported by it

* Burns, Perkins, et al [16] is not included because it was a retrospective examination of medical records, thus not relevant to the current listing.

**Although they are technically not identical, VAS (visual analog scale) and NRS (numerical rating scale) are used somewhat interchangeably in reporting research.

Information on Sessions

The number, duration, and frequency of sessions varied widely. Information is presented in Table 3.

Table 3. Number, Duration, and Frequency of Sessions*

Author(s)	Number of Sessions (planned)	Duration of Sessions (planned) or length of time of music	Frequen-cy of sessions	Follow-up or additional comments
Music Therapy				
Burns Azzouz, et al, 2008 [14]	Up to 8 (est. 5.76 based on report)	45 min. (target length)	2/week	CD given to the patients along with the suggestion that they use the CD once a day between sessions (how many did this is not clear)
Burns Robb, et al, 2009 [15]	6	60	2/week (for 3 weeks)	
Clark Isaacks-Downton, et al, 2006 [17]	1 with MT, others on own	First session, 45 min-1 hr (assessment of patients' musical preferences and explanation of relaxation procedures and the procedures for the study)	After first session, patients listened to music on their own (average 4.7 times a week)	
Gutgsell Schluchter, et al, 2013 [18]	1	20 min	1	
Hilliard, 2003 [19]	2-13	Varied; specifics not available		

Palmer Lane, et al, 2015 [20]	1	5 min	1	
Robb Clair, et al, 2008 [21]	1	30 min		
Robb Burns, et al, 2014 [22]	6	60 min	2/week for 3 weeks	
Music Medicine				
Chi Young, et al, 2015 [37]	4	30 min during the first 44 hours of the brachytherapy treatment	3 on Day 2; 1 on Day 3	
Danhauer Vishnevsky, et al., 2010 [38]	1	Listened throughout procedure, which lasted 5-40 min	1	
Eckhouse Hurd, et al, 2014 [39]	1	20 min	1	Music was administered during the first 48 hours of the hospital admission to deal with anxiety
Huang Good, et al, 2010 [40]	1	30 min	1	
Jeppesen Pedersen, et al, 2016 [41]	1	10 min	1	
Kwekkeboom, 2003 [42]	1	Music used throughout procedure	1	
Li Yan, et al, 2011 [43]; Li Zhou, et al, 2011 [44]; Zhou Li, et al, 2011 [45]	Average 13.6 and 18.9 = 32.5 days	30 min per session	2/day	Listened to music for 30 minutes two times a day from the period after their mastectomy (13.6 days) and two chemotherapy periods (18.9 days)
O'Callaghan Sproston, et al, 2012 [46]	1	Music used throughout procedure	1	Listened to music during an initial radiotherapy session

*Does not include medical records review [16]

Overview of Differences

The music therapy and music medicine studies were compared as to the number of participants, presentation of music, number of sessions, length of sessions, whether

intervention content and an intervention theory were provided, whether music therapists were included as authors, the types of journals in which articles were published, areas of intervention, and whether CONSORT guidelines were followed. These are summarized in Table 4.

Table 4. Overview of Differences*

	Music Therapy	Music Medicine
Number of Participants	<i>M</i> = 100.88, <i>SD</i> = 69.71, range = 12 - 207	<i>M</i> = 97.25, <i>SD</i> = 33.91, range = 58 - 143
Presentation of Music	Music therapist(s) facilitate use of live music, 4 (1 of these was a variety of music-making by clients); "patient preferred"*** recorded music, 2; music imagery, 1; therapeutic music video created by patients, 2	All were recorded music, including music of the patient's choice, 5; specially composed music for patient, 1; music video, 2
Number of Sessions	1 session (3 studies) 1 session with MT, others on own (1) 8 planned (5.76 estimated completed) (1) 6 sessions (2) 2-13 (1)	1 session (6 studies) 4 (1) 32.5 (one session on each day of treatment)
Length of Sessions***	Mean = 40; <i>SD</i> = 20.53, range = 5-60	Mean = 22.9; <i>SD</i> = 7.69; range = 10-30

Intervention Content Provided	All of treatment studies described the interventions to some extent Interventions for Burns Robb, et al [15] and Robb Burns, et al [22] were the same, the creation of a music video Robb Clair, et al [21] was an active music intervention that used various interactive music activities for young children; the protocols for these research studies specified particular activities or activity choices at each stage of the intervention. Palmer, et al. described the music as “patient-selected” with no additional information Gutsgell, et al [18] spoke of “harp music chosen by the music therapist” Hilliard [19] used music therapy sessions with hospice patients, and included a list of music therapy techniques used in most sessions. Clark, et al [17] determined music preferences, explained relaxation techniques, and talked about when music could be played by patient to decrease anxiety, pain, fatigue, or depression Burns Azzouz, et al [14] described music imagery education and sessions, although without details of sessions, which were individualized	Five described the music as being of the patient’s choice or selected from styles offered by the researcher: Li, et al [43, 44, 45] – music of patient’s choice, from selections chosen by experts that included a total of 202 items of light music, falling into four types: classical Chinese folk music, popular world music, and Chinese relaxation music Danhauer, et al. [38] - music was chosen from eight possible styles, which were listed in the study Kwekkeboom [42] - the style of music chosen by each of the participants was listed. O’Callaghan, et al [46] – music brought from home Chi, et al [37] - music video chosen after watching brief segment Two did not use music of patient’s choice: Eckhouse, et al. [39] utilized music, titled “Music focused relaxation: A harp and voice meditation;” composed by the music therapist who was involved in the study, however, no session details were provided Jeppeson [41] used MusiCure, is specially composed recorded music, intended to relieve anxiety Huang et al. [40] – four tapes, two of Taiwanese music and two of American piano and harp music
Intervention Theory	4 referred to a theory on which the study was based (3 used Contextual Support Model of Music Therapy; 1 with music and imagery)	3 referred to psychological theories (Hall’s Core, Care, and Cure Model; cognitive theory of pain; Goode and Moore Theory of Acute Pain Management); none specifies how the type of music or its delivery influenced the outcomes identified in the theory
Music Therapists Included as Authors Types of Journals	All included at least one music therapist 2 studies in music therapy journals, 1 in a nursing-oncology journal, 5 in oncology, 1 in palliative care/pain management	Three studies included music therapists 3 studies in nursing, 1 in nursing-oncology, 4 in oncology journals
Areas of Intervention	2 studies were of patients in hospice and palliative care; included 1 study of women being treated for breast cancer, 1of people having radiation therapy	0 studies of patients in hospice and palliative care; included 1 study of women being treated for breast cancer, 1of people having radiation therapy
Adherence to CONSORT Guidelines	Articles generally adhered, with improvements in more recent articles	Articles generally adhered, with improvements in more recent articles

**Does not include retrospective medical record review.*

***The term “patient preferred” in the context of these studies refers to the patient choosing music selections from a limited list of genres. In some music therapy models, this is not considered actual patient preferred recorded music, which in reality would be an open-ended process that includes the patient selecting specific composers and/or titles and recordings.*

**** Some calculations of length of sessions based on estimates (from information available in report).*

Since the studies were divided into classifications of music therapy or music medicine, the panelists were consistent in their definitions of the two, with interaction with a music therapist being a main feature that distinguished the music therapy studies from the music medicine studies. The few similarities and differences in the populations served, as reflected in the chart, did not appear to show any systematic differences.

The content and theory underlying the music interventions, based on reporting guidelines [58] were examined. Some studies followed these guidelines in that they provided details of the materials used and how the

intervention was carried out for the participants. A few studies also provided the underlying rationale for the music selected.

Discussion

This study examined the question: Does music therapy research differ from music medicine research in oncology, and if so, what are these differences? The comparison of music therapy and music medicine studies suggests that there are similarities between them and some distinctive features to each, but it is difficult to make the claim that any of the detected differences would have a great impact on the findings

of the research. The first part of this discussion considers the features that differ, while the second part focuses on the use of music and some concerns that are specific to the music studies.

Research Features Evident in Music Therapy Versus Music Medicine

The presentation of the music differs between the two research areas. One obvious difference is the finding that music medicine consistently uses only pre-recorded music, reinforcing Dileo's [1] definition of music medicine. Beyond that, two music medicine studies used music recordings that were specifically composed for the study. The others used music recordings selected either by a music therapist, brought from home by the patient, or selected from a list of types or genres. These practices are typical of music medicine, where interaction with a music therapist—and thus the opportunity to discuss the selection of music—is not included. And while the presentation of recorded music only and the process as to how it was used might appear to some as a weak intervention, it did not seem to have differential effects on outcomes such as anxiety, pain, and depression compared to music therapy. In other words, and within tentative statistical generalizations, both types of research produced outcomes beneficial to the participants. Most of the music therapy studies utilized live music for at least one of the conditions, but there is no indication from the results of these studies that live music was more effective than recorded music for these outcomes. Although comparisons were made regarding the presentation of the music—how it was offered, the timing of the interventions, how the live music was played, and so forth—these do not seem to have led to differential outcomes. Alternatively, the outcome variables did not measure the preference of live versus recorded music. Therefore, it is still possible that this factor could influence quality of life, mood, and other variables such as procedural support which is dependent on changing musical elements in real time to the needs of the patient. Moreover, it would be helpful to examine outcomes with children in oncology as they may be more impacted by the presence of live or recorded music facilitated by a music therapist versus recorded music only.

Descriptions of the music interventions, both in how the intervention content was reported, and whether an intervention theory was included, were similar in both research approaches. Although reports of the use of recorded music, as in most music medicine studies, were more straightforward than what was described in the music therapy studies, there were no other major differences between the two types of research. Furthermore, music therapy and music medicine were quite similar in their use of and reporting of an intervention theory for the use of music. Treatment of cancer is very complex. The needs of the patients vary depending on the type of cancer, age of patient, comorbidities, treatment

stage—diagnostic procedures, disease-directed treatment, palliative care, hospice—and an increased reliance upon theory will make the research more relevant.

Measures of dependent variables were quite different between the two types of research. The music therapy studies employed a wide variety of measures. One reason that so many were applied was that the studies investigating the therapeutic music video treatment were based on related theoretical models. One of the studies used a behavioral measure. Five used a visual analogue scale (VAS) or numerical rating scale (NRS) and two used the Spielberger State-Trait Anxiety Scale. Most of the music medicine studies (seven) used the Spielberger test, and five used a VAS. The VAS in both areas was used primarily to rate pain. Studies in both areas also incorporated other measures, although no others were used as frequently as the Spielberger test and VAS.

The other areas of comparison—disciplines of researchers, journals of publication—did not lead to differences that appear to be meaningful. Adherence to CONSORT Guidelines has improved as time has gone on, seemingly indicating that researchers are more aware of these guidelines and increasingly implementing them. This does not seem to vary between music therapy and music medicine, but rather is improving over time.

Limitations

Disciplines of researchers. It was not possible to determine all of the disciplines of researchers. For some of the articles, no information was given about authors' degrees, credentials, or affiliations. If credentials or background information was given indicating they were music therapists, nurses, physicians, or social workers, making that determination was fairly simple and accurate. Many authors were identified as having a PhD, but unless additional information was given, this was insufficient to determine the person's discipline.

Most of the music therapy studies included at least one music therapist as an author. Three of the music medicine studies included music therapists as authors, yet these studies were classified as music medicine. A music therapist was first author of one of these, with another music therapist among the co-researchers [46], but the intervention as reported did not include any interaction or relationship with the music therapist; thus, the study appeared to be a music medicine intervention. In each case, the decision to classify these studies as music medicine was based on the description of the intervention that was provided in the article; no direct communication about this was made with the authors of the articles.

Concerns Specific to the Music

The potential impact, quality, and clarity of description of music interventions both between and within the music

therapy and medicine studies ranged from outstanding to concerning. As per the actual interventions used, the authors ask what level of power to impact participant responses was evoked by those chosen interventions? One panelist voiced concern as to the merit of the intervention used and the accuracy of the reported outcomes in a particular music medicine study.

[For the most part] from a clinical standpoint the interventions are limited and unadventurous. I believe that these are important points to consider. From my experience as a clinician I have to say that, for the most part, and aside from reported outcomes, the interventions themselves in some of these studies appear to be of limited therapeutic value—consisting mostly of passive listening of very limited pre-recorded music choices. I found myself questioning the accuracy of some of the outcomes, especially concerning passive listening to treat pain and depression.

Of relevance, but beyond the scope of this study, questions of clinical value arise often in quantitative research. For example, were participant's experiences of the interventions really captured by the research approach, specifically with quantitative data collection and analysis of standardized patient outcomes? In other words, would a qualitative approach have produced a richer picture of the interventions' effects? Concerns about the lack of congruence between what actually occurs in music therapy and then how it is researched were foundational to Aigen's [59] study, *The Roots of Music Therapy: Towards an Indigenous Research Paradigm*, in which he provides a strong argument for the need for qualitative research in music therapy. How to research and evaluate music therapy in a way that reflects what actually is accomplished in music therapy, given the process of music therapy, is a focus of ongoing discussion among researchers [60, 61]. This lack of congruence was also addressed by McFerran [62] when she suggested that people "find it difficult to answer questions that aim to simplify [a] relationship for the purposes of calculations."

It is difficult to know how well the research included in the present study dealt with this issue, since in some cases, clinicians may have felt that they were applying methods that would be useful clinically, while another person (either a clinician who viewed treatment differently or an outside evaluator, such as the panelist who was quoted) would not view the work in the same way.

Potvin et al. [4] sought to understand more about the music therapy process in a way that could help to bridge the gap between research and practice. In a qualitative secondary analysis, not included in the initial quantitative analysis,

researchers sought to understand patients' experience of music therapy, an attempt to go deeper than knowing that music therapy influenced their symptoms. They found three themes that were central to the music therapy process: relaxation, therapeutic relationship, and interpersonal relating. These themes represent components of music therapy that modified participants' experiences of their symptoms.

Such modification [4] is exemplified by Donald and Carey [63] who, while not addressing music research per se, regard the process and outcomes of psychotherapy as causally entangled: The client's and therapist's efforts to responsively regulate the therapeutic process should be seen as being integral to outcomes rather than a source of confounding variance. They suggest that qualitative research may provide additional insights into the process of how psychotherapy is effective, due to its ability to explore phenomena from multiple perspectives. This is particularly important as research has suggested that qualitative differences in treatments can be masked beneath quantitatively equivalent outcomes and that, as a result, a continued overreliance on quantitative research may limit the discipline's overall ability to account for and differentiate the effectiveness of psychotherapies.

Last, there are many problems regarding how the music is described. Without detailed protocols, it is challenging to understand the procedures, replicate the research, or apply findings to future clinical applications. Robb et al. [58] state, "Music-based interventions are especially difficult to describe fully and transparently because of the complexity of music stimuli and other factors such as choice of music, mode of delivery, or the combination of music with other intervention strategies" (p. 343). Furthermore, a replicable music therapy protocol often includes a number of music-based interventions. The unique needs of an oncology patient are taken into account by the music therapist, who personalizes the treatment plan for each patient, and may select multiple music-based strategies. Similarly, in conducting a review of "Music-based Therapeutic Interventions for People with Dementia," Vink and Hanser [64] point out that practice standards in the field of music therapy require protocols that address specific patient needs, while clinical trials require standardization and replication of interventions across multiple samples. In what would be classified as a music medicine study, two musicians who delivered a music intervention for people with dementia in long-term care as part of a randomized controlled trial reflected upon their experience, and their responses were analyzed thematically [65]. Two themes emerged: design of the protocol and efficacy of the music program. These musicians felt that the music intervention protocol was appropriately designed and successful for their patients.

Some of the music therapy studies provided protocols that included detailed descriptions of how the music was used.

However, as might be expected, these protocols did not lead to exact musical procedures or reporting. In general, the music therapy studies provided more precise information on the music and how it was used than the music medicine studies, which addressed general aspects of the music or genres.

The following examples show how some researchers articulated their music interventions. In describing his music therapy interventions, Hilliard [19] wrote:

The philosophical foundation of the music therapy program at Big Bend Hospice is a cognitive-behavioral approach where music therapy interventions are designed to treat identified problems and allow for the expression of emotions while respecting the process inherent within the live musical dialogue. All music therapy interventions in this study utilized live music, and all music selected was subject-preferred. Each subject received at least two music therapy sessions. During the course of the study, subjects died at varying intervals. Therefore, some subjects received only two sessions while one subject received thirteen sessions.

Music therapists treated a variety of clinical needs of their subjects during the study and utilized a myriad of techniques. While needs and interventions varied, some themes emerged. Among these, most music therapists utilized one or more of the following music therapy techniques: song choice, music-prompted reminiscence, singing, live music listening, lyric analysis, instrument playing, song parody, singing with accompaniment using the iso-principle, planning of funerals or memorial services, song gifts, and music-assisted supportive counseling. (pp. 122-23)

Robb et al. [22] describe their music therapy for adolescents/young adults (AYAs) undergoing stem cell transplants:

TMV content was designed to accommodate acute phase HSCT demands. Most cognitive and active intervention components occurred in sessions 1-3, during the first 2 weeks of transplant, when AYAs usually experience less symptom distress. Sessions 4-6 had fewer active components and provided activity-level flexibility. Sessions 1-3 included singing, brainstorming, lyric writing, discussion, and song recording. Sessions 4 and 5 used AYA-developed song lyrics as a foundation for

selecting visual video content (e.g., artwork, photographs) through storyboarding and discussion. In session 6, participants viewed their completed video and had the option of a “Video Premier” with family, friends, and/or hospital staff. (p. 912)

They also provide detailed information on the intervention, labeled “TMV Intervention: Summary of Contextual Support and Intervention Content,” which includes the elements of contextual support by week and by session.

These examples could serve as models for music therapy and music medicine researchers.

While it was necessary to have an established range of publication years for research to be included in this review, two recent studies provide clear examples of music therapy that detail methodology and use of music clearly. Rossetti et al. [66] investigated the effects of music therapy on anxiety and distress in patients undergoing radiation therapy, with positive results for those receiving music therapy. Burns et al. [67] examined the effects of supportive music and imagery compared with preferred music listening on responsiveness to music therapy, distress, anxiety and depression, and benefit finding (how patients identify benefit during and due to the cancer experience), in a theory-driven study, with findings that help to understand in what situation one intervention may be helpful compared with another. These are two examples of music therapy research that have adhered more consistently to reporting guidelines.

Implications for Music Therapy and Music Medicine

The primary purpose of this study was to compare music therapy and music medicine research in oncology, with the goal of helping researchers articulate their methods for purposes of replication and clinical application. The quality of research has improved over time as supported by the CONSORT evaluations, which were adhered to in more recent articles. This is, of course, an encouraging sign for research in both music therapy and music medicine.

Transparency of reporting is an issue, and one of the concerns with some of the studies reviewed is that they did not fully report their procedures. This was a particular problem in reporting music interventions.

It is noteworthy that the emerging specialty of integrative music therapy combines aspects of music therapy and music medicine within a holistic approach. Integrative music therapy is an evidence-based practice that applies mechanisms explained by psychoneuroimmunology, values ancient healing modalities throughout the world as well as contemporary thinking and technology, and incorporates the caring nature of a creative therapeutic relationship [68]. Further, medical music psychotherapy, another emerging variation of the

integration of music and medicine and its essential relationship attitudes such as quality of caring and creativity should be accounted for in research [69, 70]. These models illustrate an integration of music and medicine that avoid divisiveness of music therapy and music medicine. They also offer an opportunity for dialogue amongst music therapy clinicians and researchers with medical professionals to explore what and why to integrate for beneficial patient outcomes. This study, by delineating characteristics of each research specialty, serves as a basis for such a dialogue.

A limitation of this study is the complexity of treating cancer. As stated earlier,

cancer treatment itself is not a homogeneous process from which to draw these studies. There is extensive variation in the field of oncology music therapy, dependent on the type of cancer, stage, age of patient, and comorbidities of the patients. Due to this complexity, it is extremely difficult to apply any conclusions to all music therapy or music medicine oncology studies.

Although the focus of the article is a comparison of research in music therapy and music medicine, general themes tabulated in the final oncology areas deal with themes of Pain, Anxiety, End of Life and also include a myriad of music and clinical music therapy practices. In this way, the article itself spans a breadth of populations and themes relative to cancer practices, extending beyond the focus on research methodology. This makes it more relevant to a range of those dealing with oncology.

Given the number of medical professionals working with oncology patients who want to see music used to alleviate anxiety and pain of their patients, and given the limited number of music therapists in comparison available to hospital settings, the role of music therapist as consultant to medical settings could impact the quality of music medicine research and evidence-based integration of both practices. The influence of music therapy consultants could lead to improved music medicine interventions, reporting, and professional practice standards that delineate the best practices of music use by medical personnel. The result of such an alliance might also be an improved quality of research having the desirable qualities of being led by a theory, a feasibility study to begin, and meaningful outcomes measures that relay the participants' experiences.

Of course, a major goal of research is to advance clinical practice. When the individuality and creativity of every person with cancer is valued, defining and delivering standardized music interventions remains a significant challenge, whether they are considered music therapy or music medicine. Advances in integrative music therapy may also guide practitioners in aligning findings from both specialties into a more potentially effective and comprehensive approach.

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