

Running Head: MUSIC THERAPY IN PEDIATRIC ONCOLOGY

The Use of Music Therapy in the Pediatric Oncology Setting

Senior Honors Thesis

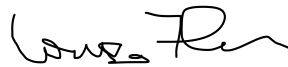
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Abstract

This paper explores the use of music therapy in the pediatric oncology setting. Music has been used as a form of therapy in multiple fields of medicine and has been found to be beneficial for patients and families. Music therapy comes in many forms, ranging from simple music listening to comprehensive song creation. The pediatric oncology patient experience is full of challenges related to treatment and setting. This study aims to compare and contrast different forms of music therapy used in this specific setting, study the subsequent outcome measures, and inform future research in this topic.

Introduction

Pediatric oncology focuses on the treatment of a multitude of cancers in children and adolescents (American Cancer Society, 2018). The similarity between most types of pediatric cancers is unfortunately the long, difficult process of treatment for the patients and families. Currently, cancer survival rates in pediatric oncology have increased, resulting in an increased number of patients needing psychological support (Coughtry, 2018). Whether patients are in the hospital setting receiving chemotherapy or going to an outpatient clinic for radiation, it is often an uncomfortable and stressful experience. The psychosocial implications include anxiety, depression, and post-traumatic stress disorders, which can dramatically impact patient's quality of life during and post treatment (Coughtry, 2018). In pediatric oncology, studies have shown that being in an unfamiliar setting and interacting with new healthcare professionals on a daily basis can cause unwanted anxiety and stress for pediatric patients (Oschner, 2012). The recommendation for patients in this setting includes psychosocial support and physiological support (Coughtry, 2018). Understanding the psychological stress is crucial in providing appropriate care and catering to the emotional needs of the pediatric oncology patient.

Each patient has his or her own interests that they find entertaining, such as playing video games or listening to music, and these can help alleviate stress due to the process of cancer treatment. Music is one form of entertainment that has provided anxiety relief for generations and can come in the form of personal listening or therapy (Good Therapy, 2015). Music therapy is the use of musical interventions to accomplish individualized goals within a therapeutic relationship, guided by a credentialed professional. Examples of interventions include creating, singing, moving, or listening to music. Music therapy can aid in the physical, emotional, and social health of the patient and can promote the expression of internal emotions that

communication alone may not accomplish. Research has shown that music therapy can also increase motivation to do daily activities and improve overall rehabilitation (American Music Therapy Association, 2015). Music is a universal interest that provides a wide array of styles that can suit each person's preferences, allowing music to positively impact more communities of people compared to other forms of leisure activity (Schafer, 2013). The emotional and physical strain that pediatric oncology patients and families have to face has brought to attention the stark need for psychosocial support in all forms, including non-pharmacological therapy (Oschner, 2012). The impact of music therapy and the need for long-term support in pediatric oncology are brought together and discussed in this literature review. The purpose of this literature review is to describe the types of music therapy interventions used in the inpatient and outpatient pediatric oncology setting and examine the related outcomes associated with these interventions.

Methods

Four web databases were used to search for peer-reviewed journal articles published from January 2003 to December 2017. The databases included the Music Periodical, PubMed, PsycINFO, and CINAHL. The date range includes articles from 15 years ago to the present to ensure that there would be a sufficient number of articles, given that music therapy in pediatric oncology is a relatively novel intervention. After meeting with the university health science librarian, the following search terms were used: music* and pediatr* or child* OR adolescen*, or family, and oncolog*. Additionally, other search terms that are variants of music and child were used.

To be included in this review, the study must: 1) focus on the use of a music therapy intervention with pediatric oncology patients 21 years and younger, 2) be written in the English

language and published between 1/1/2003 and 12/1/2017, 3) be peer reviewed, 4) include an intervention that is studied, and 5) compares the before and after intervention use. Exclusion criteria included: 1) music therapy in patient populations other than pediatric oncology patients, 2) studies that used music therapy in conjunction with other therapies, 3) studies with a focus on music therapy assessment tools, and 4) systematic/integrative reviews. This search resulted in 505 articles (Figure 1). After reviewing article titles, 447 articles were excluded for not meeting the inclusion and exclusion criteria. Reviewing abstracts and excluding full-text articles resulted in 8 articles meeting search criteria that would be included in the synthesis of data.

Results

Eight empirical research studies that fit search criteria were identified and examined in this review. Five studies were randomized-control trials (RCT), two were descriptive studies, and one article was a case study that reviewed three patients' experiences using the same type of music therapy. All of the studies involved music therapy as an intervention. Three studies were conducted internationally, with two in Australia and one in Vietnam, and five studies were conducted in the United States with three studies set in the Midwest, one in the southeast, and one spanning across several hospitals across the US. All eight studies used a different type of music therapy and varying outcome measures. Five studies were conducted in the outpatient setting while three studies were inpatient. The most common pediatric cancer being treated in all studies was leukemia; other cancers included brain, bone, kidney, and eye. All studies looked at both genders and the mean age of the child was 12, with half of the studies focusing on the pre-school to school-aged pediatric population. Table 1.1 lists each studies author/year published, purpose, sample/setting, and conclusion. Table 1.2 lists age, gender, location, number of

participants, type of cancer/treatment, type of music therapy, outcome measures, subject delivering intervention, and subjects participating.

Types of Music Therapy and Outcome Measures

Each study required the use of a music therapist to deliver the intervention or, in some cases, delegate tasks for a parent to deliver. The interventions varied between each study; however, they can be categorized into two different styles- active or passive music therapy. Active music therapy requires that the participants, the pediatric oncology patients, do more than just listen to the music. Additional actions that would constitute active music therapy include songwriting, creating digital recordings of music, and patients playing their own instruments. Passive music therapy is simply listening to music, with or without headphones.

Passive music therapy. Two studies used passive music therapy. One of these studies used a specific compact disc called the Doc Children's HeartZones played in a boom box at an outpatient clinic for leukemia patients (Kemper et al., 2008). Patients would rest in a room after maintenance or consolidation treatment and act as their own control for the first session. The second session, or the second time the patient came in for treatment, the patient stayed in the treatment room listening to the boom box for 20 minutes played by a music therapist. This music is meant to decrease heart rate variability (HRV) and has been used as a measure of relaxation and stress levels for patients, with lower HRV meaning lower physiologic stress (Kemper et al., 2008). Though the music was unfamiliar to the participants, HRV was found to be significantly lower for all who completed the study (Kemper et al., 2008). This was the only study that did not allow the participant to choose the style of music and even so, there is a direct correlation with music and increased relaxation.

The second study was conducted by Nguyen et al. (2010) and used an iPod to administer the music therapy. Participants were allowed to choose the music. Heart rate (HR), respiratory rate (RR), and pain scores were lower in the music intervention group compared to the control group. Both Nguyen et al. (2010) and Kemper et al. (2008) used passive styles of music therapy, producing positive physiological effects.

Active music therapy. Robb et al. conducted two studies using Active Music Engagement (AME), with one looking at the use of AME with a music therapist administering the intervention and the second looking at the feasibility of a parent administering the music therapy (2007 & 2017). Active Music Engagement (AME) utilizes music in a multifaceted way, including time for the patient to play with instruments, listen to music in storybook form, and opportunities to choose specific songs for the music therapist to play (Robb et al., 2007). This is a purposeful type of music therapy that was developed to help increase coping skills in the hospitalized pediatric oncology patient aged 4-7 years. The 2007 study outcome measures of positive facial affect, active engagement, and initiation of activity increased with the use of AME in comparison to music listening (Robb et al., 2007). The end result was that participants with the AME intervention had a higher frequency of coping-related behaviors and decreased levels of stress (Robb et al., 2007).

Robb et al. considers the implications and feasibility of having the parent administer AME music therapy in his 2017 study. This is the only study that used both music therapists and parents to administer music therapy. Outcomes involved both the parent and patient reaction to therapy compared to using other music therapies (control group), such as listening to audiobooks. The study findings showed that it was feasible for parents to administer AME, and the difference between patient outcomes in the experimental and control group were minimal.

Additionally, parents found the administration of an audiobook to be personally less stressful and time consuming compared to AME. The study suggested parents not serving as the administrators of music therapy was beneficial to patients because they could enjoy sharing the experience with their child (Robb et al., 2017). The study also found that when the music therapist gave the music therapy, the patient was more involved and had lower distress compared to when the parent administered the intervention. This identifies the importance of having a music therapist as the administrator (Robb et al., 2017).

Robb et al. also conducted a study that explored the use of the Contextual Support Model of Music therapy (CSM) (2003). The CSM encourages patients to express their feelings throughout the music therapy process and supports the independent choice of music, songwriting, and digitally recording patients performing their own songs (Robb et al., 2003). The end product of this therapy was a music video. The outcome measure of anxiety and depression, measured by using the Children's Depression Inventory (CDI) and the State Trait Anxiety Inventory for Children (STAIC), was recorded with three participants who had the control of no music therapy and three with the music therapy intervention. All participants CDI and STAIC scores decreased, showing anxiety and depression decreased. However, the experimental group decreased significantly more than the control group (Robb et al., 2003).

Two studies use the creation of a music video as the intervention with slightly different methods of administration. One was simply a recording of the patient performing their own song (Robb et al., 2003) while the other study included six sessions with the music therapist using multiple elements to create the music video (Burns et al., 2010). These elements included lyric writing, digitally recording songs, and choosing photos and artwork of the patients choosing. The music therapist created a final music video after all six sessions for the patient and family to

keep. An interview 100 days post intervention evaluated the patient and family experience of using this type of music therapy and the most common statements about the intervention itself were that it enhanced communication, connectedness, and that it buffered challenges caused by stem cell transplant treatment (Burns et al., 2010).

Barry et al. (2010) used compact disc creation as the music therapy intervention. This intervention required a music therapist to guide patients through a computer software program that would allow them to pick songs. These songs were put on a playlist by the music therapist and played for 20-90 minutes for the entirety of the radiation treatment. Pediatric patients and parents filled out surveys post intervention and a majority of the responses stated that music therapy compact disc creation (MTCD) was engaging and fun. There was also an observable difference in social withdrawal, with 67% of patients not receiving MTCD displaying this and 0% of the intervention group displaying this (Barry et al., 2010).

The music therapy intervention that was the least structured was O'Callaghan's study looking at three different case studies retrospectively (2013). For patients receiving 6 weeks of radiotherapy, a music therapist would invite pediatric patients in the waiting area of an outpatient clinic to play instruments one morning a week to make their own music and sing. Sessions were open ended and could last as long as three hours. The authors of this study observed patient reactions to therapy and recorded communication with patients and families being studied. Study findings from this observation showed that patients were able to forget about the stress even if it was for a short amount of time, and they were able to express themselves more than they could have without the use of therapy (O'Callaghan et al., 2013).

Discussion

This review aims to evaluate the use of music therapy in the inpatient and outpatient pediatric oncology settings and the corresponding outcome measures that have been used to study it so far. The literature search led to only eight articles fitting inclusion and exclusion criteria. Although the use of music therapy appears to produce positive outcomes, its use has not been explored in great detail and is not currently well structured. The studies found that music therapy improves psychological stress in the pediatric oncology population and both active and passive music therapy leads to beneficial physiological outcome measures, such as decreased heart rate.

Each study had slightly different outcome measures, but what connects all of these studies is the common purpose of better understanding the effects of music therapy on psychological stress. The challenge that comes with researching psychological stress is the risk of obtaining subjective, or biased data (Sood, Priyadarshini, & Aich, 2013). Most studies in this review recognized this challenge to quantify psychological stress and overcame it by using established measures, such as the Kidcope questionnaire (Barry et al., 2003) and the Visual Analog Scale (Kemper et al., 2008) as well as observational tools, such as a behavioral coding form using Skinner & Wellborn's Motivational Theory of Coping (Robb et al., 2007) and the State-Trait Anxiety Inventory for Children (Robb et al., 2003). Simply using these established measures is not enough. Reliability and validity should have been mentioned in each study that used an established measure to collect accurate participant data. Robb et al. (2003) and Barry et al. (2003) mention this, however Kemper et al. (2008) does not. If Kemper et al. (2008) does not state this, it cannot be assumed that the established measure was reliable and valid. In the future, music therapy researchers should include reliability and validity of the measures selected. Future

studies should also consider using physiological parameters of stress like varying heart and respiratory rates as more objective measures of physiological stress like Kemper et al. (2008) and Nguyen et al. (2010) did.

All of the studies showed clear psychological or physiological benefits with the addition of music therapy. Few studies, however, examined the combined physiological and psychological outcomes after the use of music therapy. More studies need to be done that consider both of these parameters concurrently. The quantitative results of heart rate variability and pain scores can fill in the gaps of information that qualitative results cannot fully provide, and vice versa. This could help provide a more complete picture of the participant and provide a better understanding of how music therapy affects the whole person.

Comparing the different types of interventions used in each study sheds light on the specific benefits each style brings. Passive styles of music therapy may not require the use of a music therapist, ultimately making the therapy less expensive, whereas active styles of music therapy provide a more in-depth experience for the patient and more visible quantitative and qualitative outcomes. Both styles did result in improved outcome measures. The two studies that used passive styles of music therapy (Nguyen et al., 2010 & Kemper et al., 2008) had the benefit of simple implementation because the music therapist did not have to modify and actively engage with the patients in comparison to the other six studies. Active music therapy on the other hand, enabled patients to personalize their therapy, allowing the patient to choose songs and activities that they truly enjoyed. The studies that focused on physiological outcomes, such as heart variability and respiratory rate, were also the studies that used passive forms of music therapy. In the future, it would be important to see how active styles of music therapies impact the physiological component of stress to more accurately compare both type of therapies.

The variables of study length and treatment phase are also worth mentioning as they had the potential of skewing some study results. O'Callaghan's study (2013) was conducted over 6 weeks of radiation therapy and by the end of the study, most participants and parents stated that their anxiety and stress decreased by the end of radiation therapy with the addition of music therapy. However, it is possible that their stress simply decreased because they were nearing the end of treatment. Future studies should investigate this possibly confounding variable, using a randomized control group that does not receive music therapy.

Small sample size is a problem that many of these studies faced as well. Only three studies had a sample size greater than 12 participants and of those three studies, only two were randomized control studies (Nguyen et al., 2010 & Robb et al., 2007). The results of future studies will be more meaningful if they are set up as randomized controlled trials with greater sample sizes over longer periods of time because these methods decrease the risk of confounding variables affecting research results. It is still true that all studies, regardless of design, ended up with decreases in psychological and physiological stress and evidence that suggests music therapy in pediatric oncology has a clear benefit. However, more research must be done in the way that Nguyen et al. (2010) and Robb et al. (2007) accomplished by having a greater sample size and using RCT format.

Conclusion

Music therapy is a novel intervention designed to improve the patient experience in the pediatric oncology setting. The definition of music therapy provides a wide range of therapy options that pediatric oncology patients can personalize based on their interests. These studies strongly suggest that music therapy in any form can help significantly alleviate patients' physiological and psychological stress. Implementation is feasible across healthcare settings with

access to a music therapist. Compared to pharmacological methods of anxiety relief, music therapy appears to provide a more cost-effective way of reducing patients' anxiety and improving their treatment experience. Sample size and type of study should be considered when interpreting the results of these studies and should direct future research to perform studies with greater sample sizes and RCT design. Future research should be aimed at exploring the differences between passive and active forms of music therapy in similar settings and incorporating both qualitative results, such as psychological stress, and quantitative results, such as physiologic stress, to more fully understand the patient outcomes. In summation, the literature suggests music therapy shows great promise as an effective intervention for the pediatric oncology population and future research is needed to help guide best practices with its use.

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Appendix

Table 1.1
Summary of Articles purpose and conclusion

Author (Year)	Sample/Setting	Purpose	Study Design	Conclusions
Barry et al. (2010) Australia	11 children aged 6-13 yrs. male & female	To examine the usefulness of music therapy CD creation on pediatric patients first radiation therapy treatment experience.	Intervention, mixed-method	MTCDD was fun, engaging, and developmentally appropriate for pediatric outpatients. 67% of children in standard care group used social withdrawal as a coping strategy compared to 0% of children in music therapy group.
Burns et al. (2010) USA	7 parents of 6 inpatient adolescent/ young adult aged 13-21 yrs.	To examine parent perspectives of AYAs' experience with SCT and involvement in therapeutic music video intervention.	Cross-sectional, retrospective, quantitative	350 significant statements were included in results: major themes were (1) humbling, humiliating, horrible (parent perspective on cancer tx); (2) gratitude for the benefits of TMV; (3) enhanced communication; (4) connectedness; (5) watching AYA change and grow; (6) process of parent gaining insight; and (7) ironic recognition of both the sad and beautiful. This suggests that TMV buffered challenges r/t SCT.
Kemper et al. (2008) USA	63 outpatient pediatric oncology patients at Brenner Children's Hospital, male and female, aged 0.8-18 yrs old.	To better understand how specially designed music that improves heart rate variability and subjective feelings of well being impact pediatric oncology outpatients.	Prospective cohort study	Significant improvement in relaxation with music, even though the music was unfamiliar, compared to without music/rest. HRV was significantly lower with music.
Nguyen et al. (2010) Vietnam	40 inpatient pediatric oncology patients, male & female, aged 7-12 yrs.	To evaluate if music's medical influences pain and anxiety in children undergoing lumbar puncture.	Intervention, RCT, mixed-methods	Pain scores, HR, and RR during procedure were significantly lower in the music intervention group. Interviews showed that music provided as a distraction to their usual fear and anxiety that comes from cancer treatment. It is also a low cost, easy and effective way to reduce pain and anxiety.
O' Callaghan et al. (2007) Australia	3 case studies: 9 yr old boy Jack w/ nasopharyngeal rhabdomyosarcoma; 13 yr old boy Mark w/ pineal germinoma; and 11 yr old girl Debbie w/ optic tract glioma. All patients receiving 6 weeks of radiotherapy.	To understand the human relationship factors involved in therapeutic outcomes related to music therapy use in pediatric oncology.	Intervention, qualitative	These case studies suggest that the presence of a music therapist with a patient has the potential to create a transitional space where the therapist and the music can reflect the patients thoughts and feelings. It can reduce anxiety and stress. In two case studies there was a decreased need in anxiolytics, reducing costs for patient.

Author (Year)	Sample/Setting	Purpose	Study Design	Conclusions
Robb et al. (2003) USA	6 inpatient pediatric bone marrow transplant patients (BMT) aged 9-17. Both genders	To look at anxiety and depression levels vary at different phases of BMT and observe how music therapy impacts anxiety and depression in Pediatric BMT patients.	Intervention, RCT, and quantitative	Anxiety and depression vary depending on the stage of treatment the child is undergoing. On the day of or after transplant, there is a visible decrease in anxiety and depression. The addition of music furthermore decreased anxiety and depression. Small sample size could skew validity of results.
Robb et al. (2007) USA	83 inpatient pediatric oncology patients from 6 hospitals in the United States aged 4-7 years. Both genders.	To determine the efficacy of active music engagement (AME) compared to music listening (ML) and audio storybooks (AS) and determine if positive facial affect, active engagement, and initiation of activity differs across interventions.	Intervention, RCT, observation	AME had greater positive facial affect, active engagement, and initiation of activity compared to ML and AS, showing that AME promotes positive coping behaviors.
Robb et al. (2017) USA	12 inpatient groups of child (3-8 years) and parent.	To examine the feasibility/acceptability of a parent delivered Active Music Engagement (AME + P) for young children with cancer. Also looking at child and parent engagement and affect.	Intervention, RCT, mixed-methods	AME +P was found to be feasible, however child engagement was similar between control and experimental groups. Parents also struggled to facilitate AME and some found it more stressful than the control group parents who listened to audiobooks.

Table 1.2
Summary of Article Setting, Outcome Measures, and Results

	Age/Gender /Location/# of participants	Type of cancer/treatment (tx)	Type of music therapy	Outcome measure	Subject delivering intervention	Subjects participating
Barry et al. (2010)	6-13 yrs/male and female/	Brain, kidney, leukemia, and bone/ outpatient radiation	Experimental group pick songs to put on CD's using a computer software and the music therapist used this music to create a CD that would be played during the 20-90min radiation treatment.	Pediatric interview w/ Kidcope questionnaire (audio recorded; non-validated questionnaire, however it has been used in 2 studies in the past related to coping mechanisms in ped onc; asked to report a stressor, the distress felt in relation to the stressor, and the helpfulness of the coping strategy used). Parent questionnaire (designed by authors), and radiation therapist questionnaire. All post intervention.	Music Therapist	Pediatric patient
Burns et al. (2010)	13-21 yrs/ male and female/ 7 parents and 6 AYA (adolescents or young adults)	Oncology patients receiving stem cell transplant	Therapeutic music video intervention: 6-sessions, with active interventions for the first three and passive for the last three. Sessions 1-3: music selection, lyric writing, and digitally recording songs. Sessions 4-6: pts chose photos and artwork for music video. Board certified music therapist compiles this and creates music video for patient.	Parent interview 100 days post intervention asking one broad question: "Tell me about your experience of having your AYA participate in therapeutic music video intervention." Data was analyzed using Colaizzis empirical phenomenological approach for data analysis.	Music therapists. Nurses assisted with data analysis and observing patient reaction to intervention.	Pediatric patient with parental input and observation.
Kemper et al. (2008)	Outpatient; 47 pediatric patient 0.8-18 yrs old	Leukemia patients in maintenance or consolidation outpatient treatment	20 minutes of Doc Childre's HeartZones compact disc played on a "boom box" in a quiet treatment room. Patients wore a MiniMitter 2000 monitoring unit, consisting of 2 electrocardiograph electrtodes placed on anterior chest wall	Visual analog scales (VAS) filled out by parent, looking at child's relaxation, well-being, vitality, anxiety, stress, and depression. Heart rate variability (HRV) monitored during treatment; Patients wore a MiniMitter 2000 monitoring unit, consisting of 2 electrocardiograph electrtodes placed on anterior chest wall. The standard deviation (SD) of the interbeat interval (IBI) was used to determine HRV.	Music therapist	Patient (parent present observing)
Nguyen et al. (2010)	7-12 yrs/ male & female/	Patients undergoing lumbar puncture	Earphones with music during therapy. Children picked their	Primary outcome: pain scores using the Numeric Rating Scale (NRS).	Patients (who were educated	Patient

	inpatient/ 40 patients	for tx of leukemia	own music from an iPod	Secondary outcome: heart rate, blood pressure, respiratory rate, and oxygen saturation. Both measure before, during, and after the procedure. Anxiety also measured before and after procedure. The State-Trait Anxiety Inventory was used. Interviews after w/ 10 patients, asking three open ended questions to the patient specifically.	before the procedure on how to use the iPod.	
O'Callaghan et al. (2013)	3 case studies: 9 yr old boy Jack w/ nasopharyngeal rhabdomyosarcoma; 13 yr old boy Mark w/ pineal germinoma; and 11 yr old girl Debbie w/ optic tract glioma.	All receiving 6 weeks of radiotherapy	Music therapy one morning a week in the waiting area of an outpatient radiotherapy clinic. Music instruments (ex. keyboard, guitar, percussive instruments, etc.). Patients invited to play with instruments, make their own songs, sing and compose their own music. These were open-ended sessions that could last as long as 3 hours.	Case scenarios from patients directly and/or parents, including songs that the patients made or their verbal feelings towards music therapy.	Music therapist	Pediatric patients
Robb et al. (2003)	9-12 yrs/ male & female/ 6	Pt's undergoing BMT tx	Using the Contextual Support Model of Music Therapy (allowing patients opportunity to make independent choices and express feelings regarding therapy). Pts' picked their favorite songs from a list of songs. Songwriting, discussion, and digitally recording pts performing their own songs.	State-Trait Anxiety Inventory for Children (measuring situational anxiety before and after each session) scoring between 20 (absence of state anxiety) to 60 (high level anxiety). Children Depression Inventory (score range 0-54, w/ 0 meaning absence of depression;) Children filled out both questionnaires.	Board certified music therapist guided songwriting and music video production.	Patients
Robb et al. (2007)	83 inpatient pediatric oncology patients from 6 hospitals in the United States aged 4-7 years.		Active Music Engagement (AME): developed to increase coping-related behaviors in hospitalized pediatric oncology patients aged 4-7 yrs. It included age appropriate music,	Examining positive facial affect, active engagement, and initiation compared to music listening (ML) or audio storybooks (ASB). Behavioral coding form using Skinner and Wellborns Motivational Theory of coping and indicating the presence or	Music therapist	Pediatric patient participated (with parent present and observing)

	Both genders.		<p>acoustic six-string guitar, handheld rhythm instruments, song books, puppets, and plastic animals. AME activities subdivided into: (a) greeting song, (b) instrument playing, (c) action songs, (d) illustrated songs in story-book form, and (e) closing song. Patients selected activities.</p> <p>Control condition: music listening (listen to compact disc (CD) of childrens music; patient directed) and audio storybook (listen to two illustrated story books).</p>	<p>absence of the three criteria as stated before. Trained independent observers viewed videotaped sessions to fill out the code and answer whether behaviors were present or absent. To ensure reliability, interobserver checks were conducted periodically to ensure reliability reached a minimum of 0.85 (sum of agreements/sum of agreements + disagreements).</p> <p>Behavior baseline was documented at first 5 minutes of interaction. Behavior throughout procedure was documented at 6 different intervals (2 minute time intervals). Behavior post condition was taken in the 5 minute period post intervention.</p>		
Robb et al. (2017)	3-8 yr old patients w/ parents/ male and female/ inpatient/ 20	Patients receiving inpatient chemotherapy	<p>- AME PLUS Parent Delivery Intervention. Parent Delivery Intervention: parents learned (1) common behavioral responses of young children to cancer treatment, and (2) how to deliver AME activities to support their child and sustain a sense of family normalcy while hospitalized and as they transition home.</p> <p>- AME resource kit (activity cards, play materials, music CD) to support between-session and at-home use by parents and children.</p> <p>Session 1: Information/Modeling Session. MT discussed a child behavior tip sheet with the parent and facilitated a joint session with parent/child, modeling AME activities.</p>	<p>The AME Parent Delivery Checklist: A ten item observational tool of parent behaviors important for effective AME delivery. Trained observers filled this out. Positive facial affect, child engagement, parent interviews were also observed.</p> <p>The Profile of Mood States-Short Form was a self-reported questionnaire used to measure parent emotional distress.</p>	Initially music therapist, then transitioning to parent delivery.	Patient and parent.

			<p>Parent/child received AME resource kit, a second tip sheet, and tailored suggestions for independent use between sessions.</p> <p><i>Session 2: Parent Delivery/Coaching Session.</i> MT faded modeling and assumed a coaching role, <u>as parent</u> delivered/engaged in AME activities with child. MT provided support and made recommendations</p> <p><i>Session 3: Parent Delivery/Observation Session.</i> MT observed parent deliver AME activities.</p>			
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Figure 1:
Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Diagram

