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Exploring the complex intervention framework: A research pathway for increasing scientific understanding of music therapy interventions

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Abstract

Music therapy is often defined at the intersection of science, art, and humanity. Moreover, music therapy intervention research involves dynamic and complex interactions between music, client, and therapist in the transdisciplinary field, which makes it challenging to scientifically investigate. To help increase scientific understanding of music therapy interventions, the complex intervention framework (CIF) is explored. The CIF is a research framework suggested by the British Medical Research Council and offers distinct research phases that may be useful in developing intervention-based research in music therapy. In this paper, music therapy specific conceptual models that may be used in the intervention development phase of the CIF are explored. Additionally, examples of music therapy intervention studies that align with each phase of the CIF are provided. The implementation of carefully designed and thoughtfully crafted interventions in a developmental and systematic manner using a clear research pathway such as the CIF may help contribute to the development of more rigorous research in the field. It may also facilitate better understanding of the complex interactions between music, therapist, and client, and ultimately creation and implementation of impactful interventions that lead to optimal clinical outcomes.

Keywords

music therapy,
research,
complex intervention,
pilot,
feasibility,
methodology,
theory,
intervention development

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Introduction

Music therapy is often defined at the intersection of art, science, and humanity (Bruscia, 2014). As an art, music therapy is understood in the context of aesthetics, creativity, and subjectivity. As a science, it is understood with universality, replicability, and objectivity. As a humanity, it is understood in a broader context of interpersonal relationships. Bruscia (2014) beautifully articulates the

intersectionality of music therapy by describing it as (a) an art "organized by science and focused by interpersonal and sociocultural process"; (b) a science, "enlivened by art and humanized by the therapist-client relationship"; and (c) an interpersonal process that is "motivated and fulfilled through art and guided by science" (Bruscia, 2014, p.11-12).

Music therapy intervention research examines a vast array of areas associated with how music impacts the clients we serve, from newborn babies to individuals who are actively dying. Music therapy research has shown the efficacy and effectiveness of music therapy interventions in improving the quality of life of individuals in diverse clinical contexts (Li et al., 2021). However, music therapy research often involves small-scale intervention studies that do not become large enough to show external validity. Also, some intervention studies utilise randomised controlled trials without examining core ingredients of the intervention as well as the implementation processes. In addition, poor intervention reporting and methodological issues make it challenging to thoroughly understand how music therapy interventions impact those individuals we serve and to make informed decisions (Jang & Kunde, 2021; Li et al., 2021; Robb et al., 2018).

Several authors have expressed perspectives on music therapy research. Hillecke et al. (2005) argued that due to the overlapping nature of music therapy and other scientific areas, music therapy research needs to be multidisciplinary, which involves physics, biology, psychotherapy, sociology, and musicology. While summarizing the benefits of using neuroscience methods (e.g., EEG, fMRI) in music therapy research, O'Kelly (2016) pointed out that the use of these methods should be used concurrently with other research methods that show qualitative and relational aspects of music therapy. Hunt (2015) articulated that music therapy research needs to examine relational aspects of music therapy encounters by using cognitive neuroscience methods such as neurophenomenology (i.e., integration of objective data and subjective experience) and hyperscanning (i.e., simultaneous collection of neuroimaging data from multiple individuals). Additionally, the utilisation of diverse methodologies was encouraged in Research 2025 (i.e., AMTA's initiative to increase research capacity) to increase the quality of music therapy research (Robb & Meadows, 2015).

In this paper, I introduce a framework that may help increase *scientific* understanding of interventions in music therapy research. At the intersections of art, science, and humanity, music therapists use complex interventions where the therapist, music, and the client interact in a sophisticated manner. Music therapists bring their unique philosophies and theoretical orientations to the therapist-client relationship. Music is a Gestalt where the music elements are organised and progressed in a temporal and meaningful manner to create sensory, cognitive, psychosocial, and emotional experience. Various music experiences (e.g., receptive, creative, recreative) and delivery methods (e.g., live, recorded) are adopted based on client needs, treatment goals, and the function of each music element. Within the therapeutic relationship, clients bring their own culture, musical background, and definition of health.

Given this complex nature of music therapy encounters, how can we consciously develop and implement research in a way that can help increase scientific understanding of music therapy interventions and contribute to a better understanding of the complex interactions between music, therapist, and client? To answer this question, I introduce the complex intervention framework (CIF) suggested by the British Medical Research Council and explore music therapy specific conceptual

frameworks that may be used in early phases of intervention research. I also provide examples of music therapy research associated with different phases of the CIF.

Defining the Complex Intervention Framework (cif)

Complex interventions are described as interventions that contain dimensions of complexity. These can include the number of interactions between components within the study, the range of behaviours targeted, the number and difficulty of behaviours required by those who deliver and receive the intervention, the number of groups or organisational levels targeted by the intervention, the number and variability of outcomes, and the level of flexibility or tailoring of the intervention that is permitted (Craig et al., 2019; Skivington et al., 2021). Since the initial publication of the guidelines on the development, evaluation, and implementation of complex interventions, the UK Medical Research Council (MRC) underwent several revision processes, and recent updates put greater attention to early stages of intervention research (e.g., development, piloting) as well as tailoring of interventions based on client contexts and practical issues of implementation (Craig et al., 2019).

The CIF includes four phases: Developing/identifying a complex intervention, feasibility/pilot testing, evaluation, and implementation (see Figure 1). Each phase has different research questions to be answered but shares a common set of core elements (Skivington et al., 2021):

- Considering context: The effects of complex interventions may be highly dependent on the context in which they are implemented (e.g., organisational, cultural, or economic features of the healthcare system), which may necessitate modifications to the intervention.
- Developing/refining/testing program theory: Program theory describes how an intervention is expected to facilitate desired outcomes and the conditions under which those outcomes are likely to occur. This articulates key components, how they interact, mechanisms of change, and how those mechanisms might influence the context. Program theory can promote a shared understanding of the intervention among various stakeholders. Program theory needs to be developed at the initial phase of program development with involvement of various stakeholders and refined as the intervention research goes through different phases. A refined program theory can be an important resource for evaluation of the intervention.
- Engaging stakeholders: The purpose of involving stakeholders differs depending on the context and phases of the research but meaningful engagement with stakeholders increases the likelihood of producing positive impacts (e.g., exploring lived experiences, co-development of program theory).
- Identifying key uncertainties: Judgements about key uncertainties inform research questions, which in turn guide the selection of research perspectives. Efficacy trials are usually done in highly controlled conditions so the translation of the evidence into diverse settings is limited. For complex interventions in healthcare settings, greater priority needs to be given to mixed-methods, theory-based and systems evaluation.
- Intervention refinement: On the basis of data collected or the development of program theory, an intervention may need to be refined. Feasibility and acceptability of interventions can be

improved by engaging service users to inform refinements. Refinement of an intervention is likely to occur between phases of research in response to accumulated data as well as context.

- Economic considerations: The analysis of costs and outcomes should be conducted in all phases of intervention research. Economic evaluation of cost and benefit analysis in early stages of a study will help answer questions that matter most to decision makers and stakeholders.

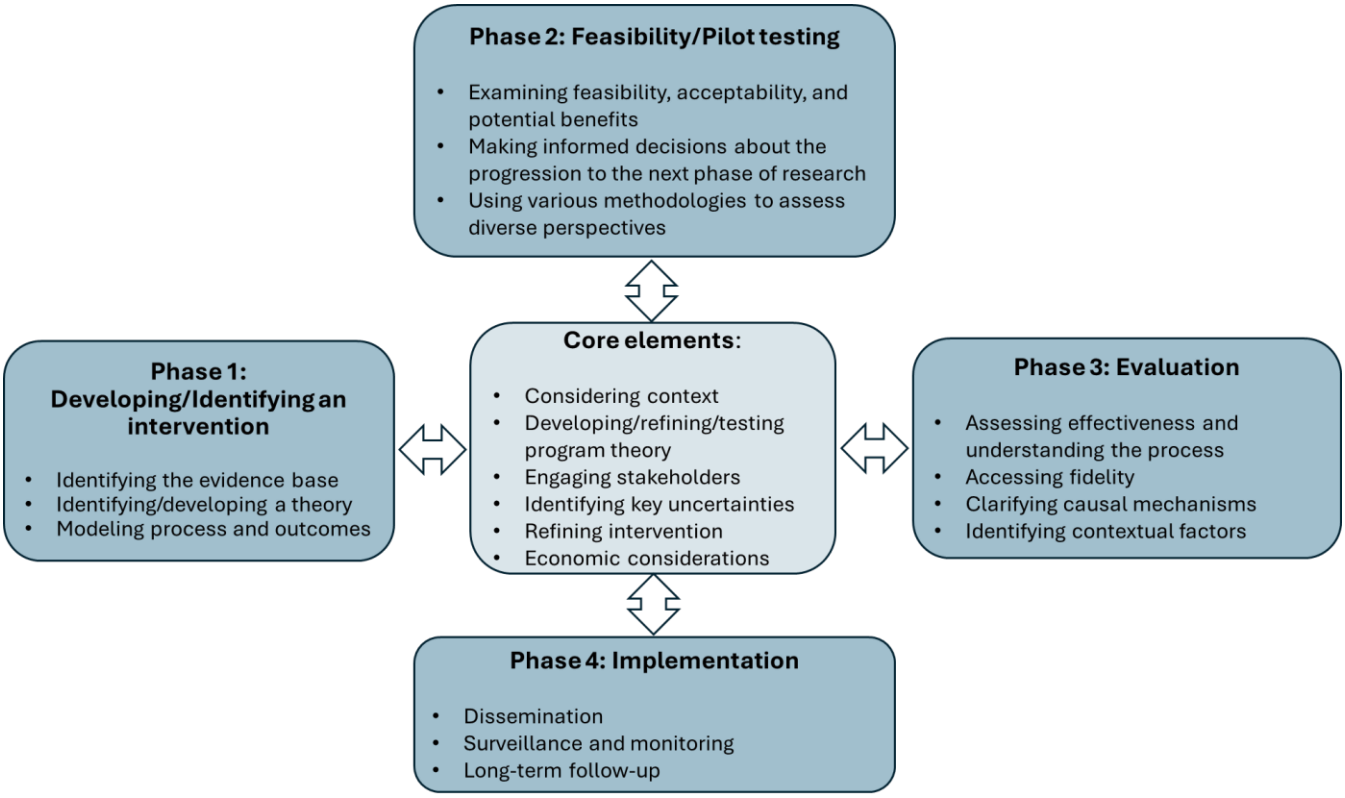

Figure 1: Complex Interventions Framework (CIF)
Adapted from Skivington et al. (2021)

Phase 1 of the CIF and music therapy research

Phase 1 of the CIF involves developing complex interventions by identifying existing evidence, identifying or developing a theory, and modelling processes and outcomes. Existing evidence can be evaluated through good quality review studies about similar interventions. Various types of reviews, such as scoping, integrative and systematic reviews, can be adopted or conducted depending on the research questions and the volume of existing literature associated with a chosen topic.

Theories in intervention research (a) help understand change processes about how and why interventions work; (b) play a crucial role in evaluating outcomes and implementing fidelity; (c) provide consistency of intervention delivery; and (d) ultimately help advance our understanding of the complex interactions between music, clients, and healthcare environment (Robb, 2012). The theory construction involves two integrated conceptualisations: problem theory and program theory. Problem

theory describes risk and protective factors associated with a specific problem whereas program theory articulates the logic of the intervention and functions as the basis for developing intervention manuals and protocols (Fraser et al., 2009).

Problem theory can be conceptualised by reviewing literature associated with specific symptoms or a disease and identifying risk and protective factors. Risk factors are those factors that increase the likelihood of developing a disorder if present for a given individual rather than someone selected at random from the general population (Institute of Medicine [IOM], 1994). Protective factors are those factors that "enhance the likelihood of positive outcomes and lessen the likelihood of negative consequences from exposure to risk" (World Health Organization, 2004, p. 1). Both factors can reside within the individual, family, or community level, and can be biological, psychological, or social in nature and do not function in isolation. Instead, there "exists a dynamic interaction among them that undergoes modification and change throughout an individual's life span" (IOM, 1994, p. 186). Examining biological, psychological, and social characteristics associated with a problem may help researchers design interventions that are ecological through considerations of possible contextual factors to have optimal therapeutic outcomes.

Constructing a program theory benefits intervention research in that it (a) guides selection of important components of intervention delivery; (b) informs evaluation process (e.g., assessing fidelity); (c) provides information on how and why an intervention works; (d) aides identification of aspects of an intervention that need to be modified or adapted based on contextual factors such as practice settings and cultural variations; and (e) provides basis for underlying mechanisms of change (Gitlin & Czaja, 2015). According to O'Cathain et al. (2019), the program theory and logic models are not static and should be tested and refined throughout the development process using data collection and stakeholder input.

Theory-based intervention research, particularly in music therapy helps "advance our understanding of the complex interactions between music, clients, and the education or healthcare environment" (Robb, 2012, p. 5). A methodology that can be useful in developing a program theory in music therapy intervention research is Hanson-Abromeit's (2014) Therapeutic Function of Music (TFM). TFM is defined as "the direct relationship between the treatment goal and the explicit characteristics of the musical elements, informed by a theoretical framework and/or philosophical paradigm in the context of a client" (Hanson-Abromeit, 2013, pp. 130-131). The TFM plan is a worksheet-based conceptual methodology that allows the translation of knowledge into theory-based intervention delivery by (a) breaking down 'music' into inherent music elements such as rhythm and melody; (b) identifying theories that support the use of and functions of those music elements; and (c) explicitly defining how each music element will be constructed, integrated, and delivered based on therapeutic goals and client contexts. The TFM plan can provide a theoretical basis for the use of each music element and its functions and allows an explicit description of how each music element will be selected and integrated. An example of the utilisation of the TFM in intervention development is Sena Moore and Hanson-Abromeit's (2015) Musical Contour Regulation Facilitation intervention. The intervention was developed by applying the TFM analysis and articulating developmentally appropriate high-arousal and low-arousal music for in-the-moment emotion regulation experiences for school-age children.

Another useful framework in theory development in music therapy is the Rational Scientific Mediating Model (R-SMM; Thaut, 2005). The R-SMM is an epistemological model that can help systematically integrate basic and applied research outcomes associated with a research question by identifying parallel brain processes between musical behaviour and non-musical behaviour (De L'etoile et al., 2012). The R-SMM articulates four sequential levels to follow to examine evidence associated with a research question (see Figure 2). In level 1, neurological, physiological, and psychological foundations of a musical behaviour (e.g., music listening) are investigated (i.e., Musical Response Models). The purpose of this level is to understand how music is processed and produced by the brain (De L'etoile et al., 2012). In level 2, the structure, process, and mechanisms of non-musical behaviours (e.g., emotion regulation) are identified (i.e., Non-Musical Parallel Models). The behaviours identified in this level are those that eventually may be targeted in a therapeutic intervention within various domains of functioning (De L'etoile et al., 2012). If a parallel process between musical and non-musical behaviour is identified (e.g., shared brain areas between music listening and emotion regulation), then a researcher may proceed to the next level.

In level 3, when a shared relationship between music and non-musical behaviour is established from research findings (e.g., finding shared brain areas associated with music and non-musical behaviour of interest), the researcher examines whether there are short term mediating effects of music on non-musical behaviour (i.e., Mediating Models). Level 3 examines basic research findings and is not designed to solve practical problems; yet provides an important foundation for theory generation and subsequent applied research (De L'etoile et al., 2012). In level 4, therapeutic effects of music are examined by looking at long-term effects of music on the identified non-musical behaviour in level 3 (i.e., Clinical Research Models). While navigating the complexities of music experiences and outcomes within a therapeutic relationship can be a daunting task, the R-SMM provides a logical framework that helps extract necessary information from scholarly journals and articulate underlying mechanisms of change (De L'etoile et al., 2012).

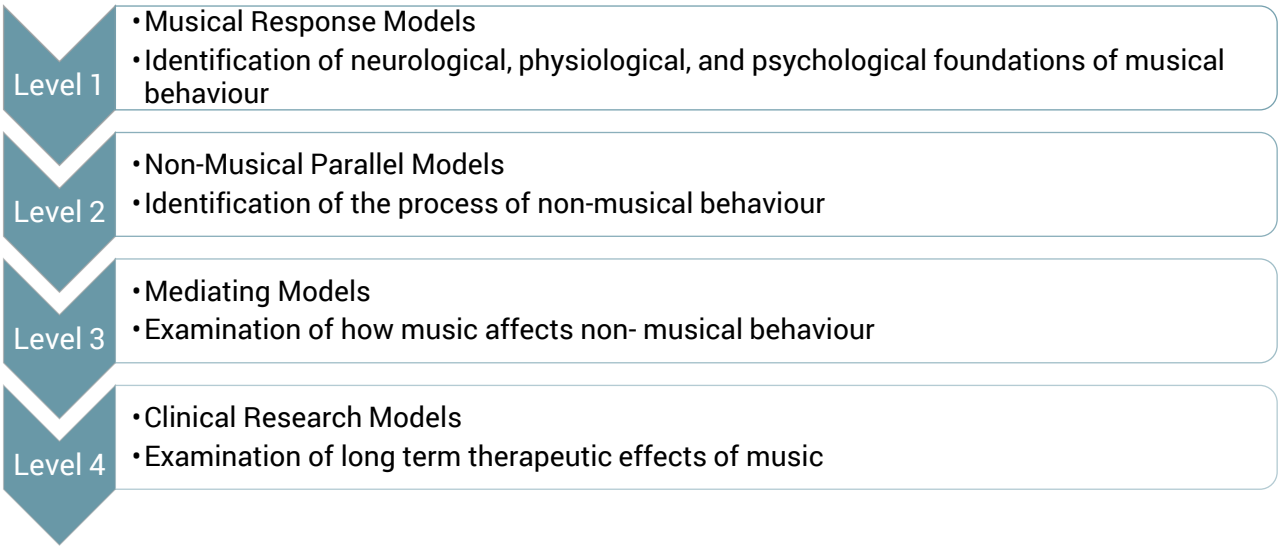

Figure 2: The Rationale Scientific Mediating Model (R-SMM)
Adapted from Thaut (2005)

In addition, modelling process and outcomes before implementing a full-scale intervention study in the development phase is suggested by the MRC. The modelling process can include specifying cost analyses, identifying suitable measures and long-term outcomes, which can help to refine the design before a full-scale evaluation occurs (Craig et al., 2012). Providing a clear pathway in a visual model helps justify the inclusion of core ingredients of music therapy interventions and demonstrates how music experiences address desired functional outcomes.

Phase 2 of the CIF and music therapy research

Phase 2 of the CIF involves feasibility and pilot testing. This step includes examination of acceptability, compliance, delivery of intervention, and recruitment and retention (Craig et al., 2013). In this process, using various methodologies (e.g., qualitative) helps identify how the intervention is experienced from the perspectives of participants, examine barriers and contexts in which interventions take place, and identify key uncertainties (Craig et al., 2013; Shahsavari et al., 2020). In addition, specific research questions associated with potential benefits of the program are answered before embarking on a larger-scale intervention study.

The term "pilot study" is often used interchangeably with other terms such as feasibility, exploratory, or preliminary trials (LaGasse, 2013). A feasibility study is a preliminary study that determines the practicality of study components, and an exploratory study focuses on generating hypothesis and/or familiarizing researchers with an aspect of a research (LaGasse, 2013). A pilot study is a small-scale study that can help a researcher examine all components of the study and make informed decisions about future larger-scale studies. Areas often targeted in pilot studies are procedural assessment (e.g., recruitment, consent, retention, and randomisation) and scientific assessment (e.g., data integrity, participant safety, and preliminary outcomes) (LaGasse, 2013). Pilot studies are not intended to test efficacy and effectiveness of an intervention using inferential statistics but are used to determine areas to be refined and/or whether to move forward to the next phase of the intervention research (LaGasse, 2013).

LaGasse et al. (2019) conducted a feasibility and pilot study to examine the adequacy of using EEG and behavioural measures to identify attentional differences between children with autism and typically developing children. The researchers also explored the potential benefits of a music therapy attention protocol on sensory gating and attention abilities. The study used a single group pretest-posttest design and showed that EEG data could be used to evaluate attentional differences between children with autism and typically developing children. The initial data also indicated the positive impact of music interventions on selective attention skills.

Burns et al. (2009) examined the feasibility and potential benefits of a therapeutic music video intervention after exploring a theoretically-based intervention involving lyric writing and video production with 3 adolescents undergoing stem-cell transplantation (Robb & Ebberts, 2003). Guided by the Adolescent Resilience model, the intervention was designed to target distress, coping, derived meaning, resilience, and quality of life and examined whether (a) the participants could complete a computer-based battery of measurements; (b) the manualised intervention could be implemented in multiple sites; and (c) an audio book group could be used as a low dose intervention to reduce attrition. The feasibility data showed that the intervention was acceptable and feasible for adults and young

adults undergoing stem-cell transplantation and the preliminary data showed positive outcomes supporting the pursuit of a larger randomised control trial. At the conclusion of the study, Burns et al. (2009) articulated the importance of this pilot work in refining recruitment, data collection, and delivery procedures.

Phase 3 of the CIF and music therapy research

Phase 3 of the CIF involves an evaluation of an intervention by assessing effectiveness and outcomes as well as understanding the process. True experimental research or randomised control trials (RCT) helps identification of a causal relationship between an intervention and an outcome. Required components in an RCT include comparison groups (e.g., experimental and control group) and random allocation of participants. If individuals cannot be randomly allocated to intervention/control groups, cluster randomised trials (i.e., groups are randomly allocated) or stepped wedge designs (I.e., phased randomisation when interventions cannot be made available at once) may be selected. Although there are challenges in meeting the demands of an RCT, Bradt (2012) posits that it is possible to design rigorous music therapy RCT studies and articulates guidelines for designing and implementing RCT studies. Randomisation provides the most robust method in preventing selection bias (Craig et al., 2019). However, when it is not feasible or impractical to use a true experimental design, a quasi-experimental or an observational design can be considered (Craig et al., 2019).

After exploring feasibility and preliminary efficacy, Robb et al. (2014) conducted an RCT that involves the music video intervention for resilience outcomes for adolescents and young adults undergoing stem cell transplants. Guided by the Resilience in Illness model, the researchers developed a hypothesis based on identified protective as well as risk factors that influence adolescents and young adults' adjustment to difficult life situations. The research was a multi-site intervention study that included eight children's oncology group institutions. The study reported improved courageous coping, social integration, and family environment during a high-risk and high-intensity cancer treatment. The study also examined fidelity strategies including standardised training, protocols for quality assurance monitoring, and intervention and evaluation team conference calls.

Understanding the intervention process provides valuable insights as to why and how an intervention worked, failed, or had unexpected outcomes. A process evaluation can be done by assessing fidelity and quality of implementation, clarifying causal mechanisms, and identifying contextual factors associated with variations in outcomes (Craig et al., 2013). Assessing fidelity plays a crucial role in evaluating how faithfully and consistently an intervention was delivered according to the essential elements of the intervention delivery. Fidelity can be evaluated in such areas as design (e.g., framework, protocol), training (e.g., training protocol, supervision), monitoring intervention delivery (e.g., key ingredients, interventionist behaviours), and monitoring intervention receipt (e.g., sessions received, participant adherence, threats) (Gearing et al., 2011). Also, variabilities in the implementation process may need to be considered based on contextual factors and cultural considerations.

Monitoring fidelity early in the implementation process helps identify deviations or omittances of an intervention protocol so that it can be corrected quickly to minimise threats to internal validity (Baker et al., 2019). When conducting multi-site studies, it is crucial to monitor fidelity to ensure

intervention conditions are similar across sites (Baker et al., 2019). Baker et al. (2019) developed five components of fidelity in their RCT that involved individuals with dementia: study design, training interventionists, treatment integrity, training intervention providers, and treatment receipt. In the study, fidelity protocol included theories, mechanisms of change, intervention manual, dose consistency, interventionist training (e.g., adherence to the protocol, role plays), treatment delivery (e.g., checklist, supervision), and video-analysis of the targeted skills. Baker et al. (2019) posited that monitoring intervention fidelity provided quality assurance framework and strengthened the rigor and internal validity of the study.

Phase 4 of the CIF and music therapy research

Phase 4 of the CIF involves implementing an intervention including dissemination, surveillance and monitoring, and long-term follow-up (Craig et al., 2012). Dissemination needs to be done clearly so that the process and results are understood with clarity by clinicians, researchers, and stakeholders for informed decision-making and replication. Music therapy intervention research has shown a lack of detailed intervention reporting (Jang, 2022; Reschke-Hernandez, 2012; Robb et al., 2018). To help increase the reporting quality of an intervention, several reporting systems associated with music-based interventions are available (e.g., Reschke-Hernandez, 2012; Robb et al., 2025). Detailed intervention reporting enables replication studies and wider scale implementation (Craig et al., 2019). Follow-up studies provide a capacity to examine intervention effects in the long-term and whether unexpected results show over time (Hill et al., 2016; Shahsavari et al., 2020). They can be particularly important if the study aims to reduce symptoms within the scope of prevention (Hill et al., 2016).

Ghetti et al. (2023) conducted a longitudinal RCT study of an intervention concerning the effectiveness of a parent-led infant-directed singing on mother-infant bonding after developing a theoretical framework and intervention protocol as well as feasibility testing. The study involved preterm infants and mothers, was conducted in multiple international locations, and showed a high intervention completion rate and acceptable level of fidelity across sites. Despite the fact that the intervention was safe and well accepted, the results did not find statistically significant effects of the intervention on mother infant bonding. The researchers suggested that the risk of mother-infant bonding may be different across cultures and recommended to look at other aspects of mother-infant bonding (e.g., vulnerable infants and families, mothers at risk for depression, parental outcomes) and utilise mix-method research to have an integrated understanding of music therapy interventions in the NICU.

As the researcher goes through the development, pilot/feasibility testing, implementation, and evaluation processes, it may be helpful to ask questions that are unique to each phase of the intervention research. The UK MRC provides some guiding questions so that researchers can clearly articulate the research agenda, evidence base, practicality, and implementation processes (see Table 1).

	Questions to ask yourself include…
Developing an intervention	• Are you clear about what you are trying to do? • What outcome are you targeting and how will you bring about change? • Does your intervention have a coherent theoretical basis? • Have you used this theory to develop the intervention? • Can you describe the intervention clearly so that it can be implemented and evaluated properly, and replicated by others? • Does the existing evidence (ideally in a systematic review) suggest that is likely to be (cost) effective? • Can it be implemented in a research setting and is it likely to be implementable if results are favourable?
Pilot and feasibility testing	• Have you done enough piloting and feasibility testing to be confident that the intervention can be delivered as intended? • Can you make assumptions about effect sizes and variability, and rates of recruitment and retention in the evaluation phase?
Evaluating the intervention	• What designs are you going to use and why? Is experimental design preferable and feasible? • If a conventional RCT is not possible, have you considered alternatives such as cluster randomisation or a stepped wedge design? • If the effects of the intervention are expected to be large or too rapid to be confused with secular trends, then selection biases are likely to be weak or absent and observational design may be appropriate. • Have you established procedures for monitoring intervention delivery or overseeing the evaluation process? • Have you included process evaluation? (This helps explain discrepancies between expected and observed outcomes and provide insights to aid implementation.) • Have you included an economic analysis? (This helps the results of the intervention much more useful for stakeholders.)
Reporting	• Have you updated your systematic review? • Have you reported your evaluation appropriately? • Have you provided detailed intervention reporting? (This is crucial for replication and bigger scale implementation of the study.)
Implementation	• Are the results accessible to decision makers? • Have you presented the results in a persuasive manner? • Are your recommendations explicit and detailed? • Strategies for implementing the intervention should be based on scientific understanding of the targeted behaviour, the relevant decision-making process, and barriers and facilitators of change. If the intervention is translated into routine practice, monitoring is needed to detect adverse or long-term effects that were not observed in the evaluation process or to examine whether the same effects observed in the study are shown in the practice setting.

Table 1: Questions to ask yourself in each phase of the CIF (Adapted from Craig et al., 2019)

Potential benefits of using the CIF in music therapy intervention research

There are several benefits that the CIF may offer in music therapy intervention research. First, it provides a framework that helps systematically develop music therapy interventions that often involve complex interactions between the music, client, and the therapist. Second, music therapy interventions can be understood better with more focus on the development phase with clearly articulated theories and the involvement of stakeholders. Third, the CIF allows the evaluation of the process and outcomes of an intervention where flexibility is taken into consideration based on client context, practicality, and evidence. Fourth, the CIF helps increase scientific understanding of music therapy interventions with more rigorous research which will contribute to further development and acceptance of the discipline. Fifth, the CIF helps partner with medical and scientific communities where science is the basis of research and practice (e.g., medicine, allied health) and share common language. Sixth, the CIF helps reduce costs and research waste that is associated with poorly designed interventions and lack of considerations of possible contextual factors (Salman et al., 2014). Seventh, the CIF provides a strategic tool that helps design interventions in a developmental manner and show clear pathways. Lastly, the CIF aligns with the themes that were identified in Research 2025 (i.e., an AMTA's initiative that was geared toward promoting research capacity, and production and consumption of high-quality research). Those themes were increasing consumer impact, involving clinicians as research partners, using diverse methodologies, developing theories, and building research capacity.

Recommendations for future music therapy intervention research

Melnyk and Morrison-Beedy (2012) articulate 5 "Ps" that are essential ingredients for conducting intervention research: (a) Prevalence of a problem and the significance of the study need to be considered; (b) Passion of the researcher is crucial for the engagement, development, and sustainability of the program; (c) Planning every element of the study in detail is necessary for successful implementation and completion of the study and building a research team who shares the passion about the topic can be extremely helpful; (d) Persistence is needed in the process writing of research proposals, recruiting, and dealing with unexpected situations ; and (e) Patience is an active ingredient in intervention research because intervention research is a long term developmental process.

Designing, implementing, evaluating, and adapting an intervention is a long-term process; thus, some researchers use the term "developmental intervention research" (Gilgun & Sands, 2012, p.349) rather than simply intervention research. Effective interventions share common features in that they are grounded in theory; are multi-component and multimodal; have outcomes that are closely related to the intervention intent; have participants actively engaged in building skills and problem solving; and involve end-users and/or stakeholders in the intervention development process (Gitlin & Cjaza, 2015).

In order to help develop impactful music therapy interventions that have the characteristics articulated by Melnyk and Marrison-Beedy (2012) and Gitlin and Cjaza (2015), the author explored the complex intervention framework and articulated several methodologies that may be adopted in the

developmental phase of music therapy intervention research. Also, the author introduced music therapy intervention studies that align with each phase of the complex intervention research framework suggested by the British Medical Research Council and articulated benefits of using the CIF in increasing *scientific* understanding of music therapy interventions.

The author recommends the implementation of carefully designed and thoughtfully crafted interventions in a developmental and systematic manner using a clear research pathway such as the CIF. This may help contribute to the development of more rigorous research in the field, better understanding of the complex interactions between music, therapist, and client, and the creation of impactful interventions that lead to better clinical outcomes and influence public health. Additionally, the author recommends exploring frameworks that contribute to increasing *artistic* understanding of music therapy interventions that may help deepen the understanding of aesthetic experiences in the therapeutic relationship. This will contribute to a more integrated understanding of music therapy interventions as both an art and science and help clinicians value and balance the art and science of music therapy in their practice.

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Author contributions

Sekyung Jang was the sole author of this paper and responsible for conceptualization, methodology, visualization, and writing (drafting, reviewing, and editing).

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Ελληνική περίληψη | Greek abstract

Διερεύνηση του πλαισίου σύνθετων παρεμβάσεων: Μια ερευνητική οδός για την ενίσχυση της επιστημονικής κατανόησης των μουσικοθεραπευτικών παρεμβάσεων

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Περίληψη

Η μουσικοθεραπεία συχνά ορίζεται στη διασταύρωση επιστήμης, τέχνης και ανθρωπισμού. Επιπλέον, η έρευνα των παρεμβάσεων στη μουσικοθεραπεία περιλαμβάνει δυναμικές και σύνθετες αλληλεπιδράσεις μεταξύ μουσικής, πελάτη και θεραπευτή σε ένα διεπιστημονικό πεδίο, γεγονός που καθιστά δύσκολη τη συστηματική επιστημονική διερεύνηση. Για να ενδυναμωθεί η επιστημονική κατανόηση των μουσικοθεραπευτικών παρεμβάσεων, διερευνάται το πλαίσιο σύνθετων παρεμβάσεων (complex intervention framework, CIF). Το CIF είναι ένα ερευνητικό πλαίσιο που προτείνεται από το Βρετανικό Συμβούλιο Ιατρικής Έρευνας (British Medical Research Council) και προσφέρει διακριτές φάσεις έρευνας, οι οποίες μπορεί να είναι χρήσιμες για την ανάπτυξη της έρευνας με βάση τις παρεμβάσεις στη μουσικοθεραπεία. Στο παρόν άρθρο διερευνώνται εννοιολογικά μοντέλα συγκεκριμένα για τη μουσικοθεραπεία, τα οποία μπορούν να χρησιμοποιηθούν στη φάση ανάπτυξης της παρέμβασης του CIF. Επιπλέον, παρέχονται παραδείγματα από μελέτες μουσικοθεραπευτικών παρεμβάσεων που ευθυγραμμίζονται με την εκάστοτε φάση του CIF. Η εφαρμογή προσεκτικά σχεδιασμένων και μεθοδικά δομημένων παρεμβάσεων, με αναπτυξιακό και συστηματικό τρόπο χρησιμοποιώντας μια σαφή ερευνητική οδό όπως το CIF, μπορεί να συμβάλει στην ανάπτυξη πιο αυστηρής και αξιόπιστης έρευνας στο πεδίο. Μπορεί επίσης να διευκολύνει την καλύτερη κατανόηση των σύνθετων αλληλεπιδράσεων μεταξύ μουσικής, θεραπευτή και πελάτη και, τελικά, να οδηγήσει στη δημιουργία και εφαρμογή παρεμβάσεων με ουσιαστικό αντίκτυπο και βέλτιστα κλινικά αποτελέσματα.

Λέξεις κλειδιά

μουσικοθεραπεία, έρευνα, σύνθετη παρέμβαση, πιλοτική μελέτη, σκοπιμότητα, μεθοδολογία, θεωρία, ανάπτυξη παρέμβασης