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Outcomes of Music Improvisation Experiences: A Scoping Review

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OUTCOMES OF MUSIC IMPROVISATION EXPERIENCES: A SCOPING REVIEW

Julia McCarren, M.M.

Western Michigan University, 2021

Music improvisation is a therapeutic music intervention utilized frequently by board-certified music therapists in various clinical settings. While music therapists frequently use music improvisation as a treatment intervention, research on music improvisation outcomes is limited. The purpose of this scoping review is to summarize current knowledge about the outcomes of music improvisation experiences in music therapy and non-music therapy contexts. This review aims to identify and address gaps in the literature to provide suggestions for future research. The findings of this review will inform clinical music therapy methods. To conduct the scoping review, the researcher used the following five-stage framework: identifying the research question, identifying relevant studies, charting the data, summarizing results, and discussing results. The analysis of twenty-nine studies on music improvisation resulted in a summary and discussion of various music improvisation outcomes, including neurologic, physiological, social and relational, emotional, communicative, phenomenological findings, additional unique outcomes, implications for music therapy, and suggestions for future research.

OUTCOMES OF MUSIC IMPROVISATION EXPERIENCES:
A SCOPING REVIEW

by

Julia McCarren

A thesis submitted to the Graduate College
in partial fulfillment of the requirements
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Julia McCarren

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INTRODUCTION

Music improvisation is a common therapeutic music intervention utilized by board-certified music therapists (MT-BCs) in many clinical settings. In an analysis of music therapy trends in psychiatric settings, improvisation was the most reported music therapy technique utilized by music therapists (Silverman, 2007). A survey of music therapy services in settings with clients with autism spectrum disorder found that 75.3% of music therapists utilized music improvisation (Kern et al., 2013). In pediatric hospitals, a survey of music therapy methods found that improvisation was one of the interventions utilized most frequently by music therapists (Tabinowski, 2013). Though music therapists frequently use improvisation, research regarding the outcomes of music improvisation experiences is limited. It helps to assess the current state of the literature regarding music improvisation to ensure music therapists understand the therapeutic function, mechanisms, and outcomes of music improvisation experiences.

Susan Gardstrom (2007) outlined the definition of clinical music improvisation in a music therapy setting and music improvisation in the book *Music Therapy Improvisation for Groups*. Gardstrom's definition of *clinical music improvisation* is:

“The process whereby the therapist and client(s) improvise together for purposes of therapeutic assessment, treatment, and/or evaluation. In clinical improvisation, the client and therapist relate to one another through the music, and the improvisation results in a musical product that varies in aesthetic, expressive, and interpersonal significance,” (Gardstrom, 2007, p. 19).

Music improvisation is:

“the process whereby the individuals extemporaneously create music while singing or playing. The intent is most often to produce a musical product of aesthetic value. In

music improvisation, the individuals do not relate to one another within a client-therapeutic relationship, and neither the process nor the outcome is intended to be therapeutic in any way,” (Gardstrom, 2007, pp. 19-20).

Music improvisation may occur in a solo, dyadic, or group context. Solo improvisations involve one player, dyadic involves two players, and group involves more than two players. (Gardstrom, 2007). Group improvisations may consist of a combination of solo, dyadic, and group instrument play. In this literature review, the researcher identifies studies that incorporate improvisation that may be considered clinical music improvisation or music improvisation.

The American Music Therapy Association’s (AMTA) Standards for Education and Clinical Training lists improvisation as an academic component for bachelor’s degree music therapy programs. “Improvisation skills in various musical styles” is a component of the curricular standards (American Music Therapy Association [AMTA], 2021).

The American Music Therapy Association (AMTA) notes proficiency in music improvisation as a professional skill for Board-Certified Music Therapists. The AMTA’s list of Professional Competencies includes improvisation in “Functional Music Skills” as follows:

4.3 Improvise on pitched and unpitched instruments, and vocally in a variety of settings, including individual, dyad, small or large group (AMTA, 2013).

The document mentions improvisatory skills again in the “Movement Skills” section as follows:

6.1 Direct structured and improvisatory movement experiences.

6.2 Move in a structured and/or improvisatory manner for expressive purposes.

However, neither AMTA document provides further specifications or descriptions regarding the improvisatory skills music therapy students and music therapists should learn and

demonstrate. It would be helpful for the AMTA to provide more details about the breadth of improvisation skills demonstrated by music therapy students and professionals.

Clinical Improvisation

Music therapy clinicians often use music improvisation to address communication, emotion, and socialization (Thaut & Hoemberg, 2014). Music improves psychosocial functioning by allowing a client to practice the nonmusical behaviors required to interact with others. These behaviors may include social initiation, reciprocation, turn-taking, responding, listening, and mirroring. Significant improvements in social functioning and peer relations have occurred when music improvisation is part of a music therapy program (Gooding, 2011). Especially among clients with symptoms that include feelings of loneliness and social isolation, musical improvisation facilitates social interaction, conversation, and self-expression that may not be achievable in modalities outside of music. According to Kenneth Bruscia, music improvisation may achieve the following clinical goals:

1. Establish a nonverbal channel of communication, and a bridge to verbal communication
2. Provide a fulfilling means of self-expression and identity formation
3. Explore various aspects of self in relation to others
4. Develop the capacity for interpersonal intimacy
5. Develop group skills
6. Develop creativity, expressive freedom, and playfulness with various degrees of structure
7. Stimulate and develop the senses
8. Play, on the spot, with a decisiveness that invites clarity of intention
9. Develop perceptual and cognitive skills

(Bruscia, 2013, p. 130)

Bruscia suggested some clinical improvisation techniques, including imitating, reflecting, rhythmic grounding, holding, and extending. Imitating is echoing or reproducing a client's response. Reflecting is matching the moods, attitudes, and feelings exhibited by the client. Rhythmic grounding is keeping a basic beat of providing a rhythmic foundation for the client's improvisation. Holding means as the client improvises, the therapist provides a musical background that reflects the client's feelings while containing them. Extending refers to adding something to the end of the client's response to supplement it (Carroll & Lefebvre, 2013).

Improvisatory Music Therapy Approaches

Creative Music Therapy

Creative Music Therapy (CMT) is a type of improvisatory music therapy, and an extension of the music therapy model conceptualized by Paul Nordoff & Clive Robbins. This model began developing in 1958 (Næss & Ruud, 2007), often incorporates music composition, and was designed for individuals with significant developmental disabilities (Howland, 2016). The Nordoff-Robbins approach often involves the production, repetition, extension, and alteration of spontaneous vocal or instrumental improvisation initiated by a client. This spontaneous improvisation typically evolves into turn-taking between the client and therapist, producing non-verbal communication that simulates infants' preverbal communication with their caregivers (Howland, 2016). Creative Music Therapy (CMT), or the Nordoff-Robbins approach, is practiced worldwide with clients of all ages.

To practice within the Nordoff-Robbins model, music therapists must complete Nordoff-Robbins training and certification. Music therapists are eligible to enroll in the Nordoff-Robbins training if they have a master's degree or possess an undergraduate degree in music therapy and

plan to enroll in a master's degree program ("Level 1 Onsite Certification," 2020). The length of training is typically one year and the total certification fee is \$8, 870 ("Certification Fees").

Analytical Music Therapy

Analytical Music Therapy (AMT), founded by Mary Priestly in 1975, is an analytically oriented, symbolic application of music that is improvised and then processed by the therapist and client (Cohen, 2017). In AMT, music functions as a creative resource through which the client gains opportunities to explore their inner life, uncover and resolve conflicts, gain greater personal insight, and realize their potential. Through the active, lived experience of music, AMT aims to build awareness and remove obstacles that prevent individuals from realizing their full potential and achieving personal goals (Cohen, 2017).

In Analytical Music Therapy, improvisations may be vocal, instrumental, or a combination of the two. The music therapist primarily uses the piano to guide all that the client expresses, and the clients typically play pitched and unpitched percussion instruments. Music therapists use AMT with an individual, a dyad, or a group, and sessions tend to last for 60–90 minutes (Cohen, 2017). AMT sessions are typically relationship-centered and music-centered. In AMT, music therapists play instruments, vocalize, and communicate in any style depending on the needs, and students completing AMT training have to demonstrate the following skills:

“be skilled musicians in piano and voice, and skilled in other instruments such as guitar and percussion, accompany a client on at least one major instrument, on the piano, and with the voice, improvise in most idioms, be good sight-readers so they can learn new repertoires, use their bodies as communication tools and as instruments, and to express themselves musically as well as bodily” (Cohen, 2017, p. 91).

In AMT, improvisation functions to facilitate boundaries, encourage emotional expression, provide support and insight, and release symbols, images, thoughts, and free

associations (Cohen, 2017). Analytical Music Therapy combines music psychotherapy and improvisation, and is deeply rooted in psychoanalytic techniques and theories. AMT music therapists now work with various clients, though techniques were initially used with clients in hospitals, rehabilitation facilities, forensic settings, and clients with learning disabilities, emotional problems, or autism spectrum disorder. To be eligible to enroll in AMT training, music therapists must meet the following requirements:

- Board certified music therapist with Master's degree in music therapy or a related field, or matriculating in Master's music therapy program
- A minimum of 6 credits in Psychology
- Prior clinical experience
- Demonstration of improvisation skills & analytic thinking ability
- Readiness to work on a deeper level of music psychotherapy (“Molloy College,” n.d.)

To practice Analytical Music Therapy, music therapists must complete four phases of training to receive certification. The total fees for the Analytical Music Therapy Certification Program at Molloy College are \$11,450 (“Molloy College”, n.d.).

Juliette Alvin

Juliette Alvin was the founder of *Free Improvisation Music Therapy* (Kim, 2016). She based her approach on Freud’s psychoanalytic concepts. Alvin's method includes free exploration, dyadic and group improvisation, and may be thematic (emotion, feeling, or image) (Carroll & Lefebvre, 2013) Players improvise on a variety of rhythmic, wind, and melodic instruments. While some improvisatory music therapy approaches employed structured improvisation and/or pre-composed music, Alvin’s approach gives the client complete freedom during music making (Kim, 2016). Alvin developed this improvisation approach for both children and adults, hospitals, schools, community settings, and for individuals with autism or

learning, behavioral, physical, and sensory deficits (Carroll & Lefebvre, 2013). In this approach, the music facilitates the growth of relationships and communication between oneself and the outside world.

Juliette Alvin believed that during free music improvisation, a player's character, pathology, and personal issues will be reflected in music (Kim, 2016). Alvin influenced many music therapists, and her methods were further developed and applied in other training courses by Tony Wigram (Denmark), and Helen Odell-Miller and Leslie Bunt in the UK (Kim, 2016). While Alvin's techniques did not morph into an establish music therapy approach, Alvin is considered a pioneer of psychodynamic music therapy.

Orff Music Therapy

Orff music therapy was developed by Gertrude Orff for children with developmental delays based on elements of Orff-Schulwerk. Carl Orff and Gunild Keetman developed the Orff-Schulwerk approach to music education based on the idea that music, movement, and speech, are connected ("Orff Schulwerk," 2021). This approach encourages children to engage in singing, body percussion, rhythmic speech, and movement. Active music and movement may involve clapping, snapping and stomping, or with pitched and unpitched percussion.

Improvisatory music-making is a central part of Orff Music Therapy (Voigt, 2013). Orff music therapy includes spontaneous play and music-making. Music improvisation as play allows children to explore, investigate, put together sounds or objects, "practice" by playing, and form associations.

To complete training in the Orff-Schulwerk model, participants must complete three levels of curriculum. The American Orff-Schulwerk Association (AOSA) offers certification to

those who have successfully completed an AOSA approved Level III course, demonstrating proficiency in Orff Schulwerk (“CERTIFICATE,” n.d.). AOSA recommends participants complete all three levels within 3-7 years.

Purpose of Scoping Review

Music improvisation is a commonly used music therapy technique. Due to the unpredictable and spontaneous nature of improvisation experiences, music improvisation is a difficult topic to study. The researcher will conduct a scoping review to assess the current state of research in music improvisation and identify gaps in knowledge. The researcher aims to find out what is known about the outcomes of music improvisation experiences. This review's findings will provide music therapists with a better understanding of music improvisation to effectively utilize music improvisation as a therapeutic technique.

METHOD

The purpose of a scoping review is to analyze a broad area of research to synthesize general knowledge surrounding a topic and identify gaps in the existing literature. The methodology used to complete this review is identified below as described by Arksey & O'Malley (2005) in five stages, and utilized by Elliott & Gardner (2018):

- Stage 1: identifying the research question
- Stage 2: identifying relevant studies
- Stage 3: study selection
- Stage 4: charting the data
- Stage 5: collating, summarizing, and reporting the results

The research question for this literature review is “What is known about the outcomes of music improvisation experiences?” The second stage of this framework involved identifying relevant studies. The researcher searched using the WMU Library/Wiley Online Library Database. The following electronic databases were used: JSTOR Arts & Sciences XI, Proquest, Proquest Central, Sage Premier 2016, Pubmed Central, Elsevier ScienceDirect Journals Complete, and Sage Journals. The researcher also searched *The Journal of Music Therapy*. The researcher searched *The Journal of Music Therapy*, rather than other music therapy journals, because of this journal’s emphasis on music therapy research. In addition, an initial search produced many relevant articles from *The Journal of Music Therapy*. The following keyword phrases identified relevant literature: “music therapy improvisation,” “music therapy,” “improvisation,” “music improvisation therapy,” “music improvisation,” “journal of music therapy improvisation,” and “improvisational music therapy.”

The third stage of the process involved study selection through inclusion and exclusion criteria. The researcher reviewed abstracts to determine relevance to the research question. Inclusion criteria used when reviewing the abstracts were 1) music improvisation was the primary focus or a factor in study, 2) peer-reviewed scholarly article, 3) the article was available in English and could be accessed online, and 4) articles were published within the last 30 years. The researcher included articles that involved music improvisation experiences in both music therapy and non-music therapy contexts. The selected studies involved both musician and non-musician participants. Studies of music therapy programs with mixed music therapy interventions including music improvisation interventions were included. The researcher excluded articles that were literature reviews related to music improvisation. Other studies that discussed improvisation but did not investigate a music improvisation experience were also excluded. The application of the inclusion criteria resulted in 29 articles.

To organize and chart the data, the researcher created a data summary table using Microsoft Excel. Categories were identified by using information comparable across studies most relevant to the research questions. The resulting categories were: neurologic outcomes, physiological outcomes, social and relational outcomes, communication outcomes, emotional outcomes, phenomenological outcomes, and additional outcomes. The fifth stage involved collating, summarizing, and reporting the results, which was accomplished by identifying commonalities between studies, categorizing and discussing the outcomes, and then identifying gaps in the research.

RESULTS

Analysis of twenty-nine studies of music improvisation revealed neurological, physiological, social and relational, communication, emotional, and phenomenological outcomes. Some studies resulted in additional unique outcomes.

Settings of Music Improvisation Studies

The settings of the studies in the articles selected included the following locations: university, elementary schools, music therapy clinic, psychiatric hospital, school, after-school care, private music studio, adult training center, special education school, after school program in low resource community, hospital, hospice, music therapy session, residential education facility, acute care clinic, music therapy laboratory, inner-urban home, school of music and drama, or recording studio at an academic music department. The school, hospital, and university lab settings occurred more than once in the selected studies.

Diagnoses or Conditions of Participants

The diagnoses or conditions of participants specified in the studies included the following: social anxiety disorder (SAD), autism, deficits in communication skills, borderline personality disorder (BPD), dyslexia, attention-deficit/hyperactivity disorder (ADHD), specific learning disabilities, Asperger's Syndrome, post-traumatic stress disorder (PTSD), anxiety disorders, social/conduct/behavioral disorders, “severe and enduring” mental illness, paranoid schizophrenia, chronic schizophrenia, developmental disabilities, pervasive developmental disorder, cancer, severe and multiple disabilities, cerebral palsy, sickle cell disease (SCD), mood disorders, depression, or grief. Participant groups that occurred more than once in the selected studies include participants with autism, schizophrenia, and ADHD.

Neurologic Outcomes

The literature includes neurologic analysis of improvisation experiences using functional magnetic resonance imaging (fMRI), electroencephalogram (EEG), and transcranial direct-current stimulation (tDCS) technology. An fMRI study investigating the neurological coordinates of lyrical improvisation, or freestyle rap, concluded that lyrical improvisation appears to be characterized by altered relationships between regions coupling intention and action. Executive control may be bypassed and motor control directed by cingulate motor mechanisms. These reorganizations may facilitate the initial improvisatory phase of creative behavior (Liu et al., 2012). In another neurologic study, professional pianists with various musical training backgrounds improvised on a keyboard while in an fMRI. The improvisation training level of the musicians was positively associated with functional connectivity of the bilateral dorsolateral prefrontal cortices, dorsal premotor cortices, and pre-supplementary areas (Pinho et al., 2014). The results of the study suggest that improvisational musical training can influence brain properties at a network level. This means that the neural connectivity involved in improvisatory behaviors may be automated by increased training. Greater functional neural connectivity found among expert improvisers may indicate a more efficient exchange of information within networks important to musical creativity (Pinho et al., 2014).

Wan et al. (2014) conducted an EEG study of two music improvisation experiments in which professional musicians with strong improvisation skills performed either improvisation or pre-composed music. The musicians performed each musical piece in a “strict” mode and a “let-go” mode. The “strict” mode was defined as playing in a mechanical manner. The “let-go” mode was described as playing in a more emotionally rich manner (Wan et al., 2014). The

researchers collected synchronized EEG data from both musicians and listeners. The study results revealed differences in neural networks between composed music and improvised music, and between “strict” and “let-go” modes. Brain regions including the frontal, parietal, and temporal regions played a crucial role in differentiating brain activities among different conditions.

Raglio et al. (2016) investigated the neurophysiological basis of Active Music Therapy (AMT) and its effects on the normal brain. Subjects participated in two AMT sessions based on free improvisation using rhythmic and melodic instruments. After the sessions, subjects underwent fMRI scans while listening to Syntonic Production (SP) and A-syntonic Production (AP) excerpts recorded during the sessions. SP excerpts included a high level of communicative and emotional involvement. SP excerpts were characterized by the presence of rhythmic and melodic synchronized sequences in which there appeared to be a clear intention to communicate. AP excerpts were characterized by a-rhythmical sequences in which the subject and therapist’s improvisations followed different courses (Raglio et al., 2016.)

The contrast between listening of SP and AP excerpts showed activation of the right middle temporal gyrus and right temporal sulcus, the right middle frontal gyrus, the right precentral gyrus, the bilateral precuneus, the left superior temporal sulcus, and the left middle temporal gyrus. The study's results were in accordance with the psychological bases of the AMT approach with the activation of brain areas involved in memory and autobiographical processes and in significant personal or interpersonal experiences (Raglio et al., 2016.) The study showed activation of the medial prefrontal cortex (MPFC) during fMRI when subjects were listening to

Syntonic Production (SP) excerpts following previous studies showing the importance of the MPFC during music improvisation.

Previous improvisation studies have shown that expertise is characterized by deactivating the right dorsolateral prefrontal cortex (r-DLPFC), a brain area associated with Type-2 executive processing (Rosen et al., 2016). Core executive processing functions include include inhibitory control, interference control, working memory, and cognitive flexibility (Diamond, 2013). Rosen et al. (2016) hypothesized that Type-1 and Type-2 processes make differential contributions to creative productions that depend on expertise. Type-1 refers to automatic, associative processes, while Type-2 refers to executive, or controlled processes. The researchers applied anodal, cathodal, and sham transcranial direct current stimulation (tDCS) over r-DLPFC to modulate the quality of jazz pianists' performances while they improvised over chords with drum and bass accompaniment. Results showed that stimulation appeared to benefit musicians with less experience but hinder those with more experiences. The findings suggest evidence for a dual-process model of creativity in which novices and experts differentially engage Type-1 and Type-2 processes during creative production (Rosen et al., 2016).

Physiological Outcomes

One study investigated the physiological effects of an improvisation experience. Participants from a vocal jazz ensemble sang in a pre-composed music condition and an improvised music condition. Concentrations of plasma oxytocin and adrenocorticotrophic hormone (ACTH) were measured before and after each singing condition. Mean plasma oxytocin levels increased only after the improvised condition. ACTH concentrations decreased in both

conditions. Higher oxytocin levels in the improvised condition may have occurred due to group music improvisation's social effects (Keeler et al., 2015).

Social and Relational Outcomes

Music improvisation experiences help individuals practice social and relational skills. During music improvisation experiences, participants have frequent opportunities to engage in interpersonal interaction. A single case-study using an improvisational music therapy approach with a client struggling with grief and finding personal identity resulted in the client becoming musically expressive and developing a closer relationship with the music therapist through musical interaction (Smeijsters & Van Den Hurk, 1999).

Scientists also investigated the musical interactions of individuals with Borderline personality disorder (BPD) during a music improvisation experience. BPD is a mental disorder that involves impairments in social functioning. Foubert (2017) examined the level of interpersonal synchronization in the musical improvisations of patients with BPD. Patients with BPD and healthy controls participated in joint music improvisation with the experimenter. The researchers hypothesized that the insecure attachment system of patients with BPD would manifest in timing behavior during joint music improvisation. Results indicated a logistic regression model based on differences in timing deviations could predict diagnosis with 82% success (Foubert et al., 2017). Controls' timing deviations decreased, whereas the timing deviations of patients with BPD did not decrease. These findings are similar to previous research that shows BPD is characterized by difficulties in maintaining strong attachment with others.

Music therapy programs including music improvisation interventions may help individuals improve overall social functioning. Gooding (2011) tested the effectiveness of a

music therapy-based social skills intervention program to improve social competence in children and adolescents with social deficits. The social skills program included mixed music improvisation interventions including music improvisation. These findings suggest that a mixed intervention music therapy program including music improvisation interventions improves social functioning among children and adolescents with social deficits.

Pasiali & Clark (2018) examined the benefits of a music therapy social skills development program for school-age children from an after-school program in a low resource community. The music therapy program included mixed interventions, including music improvisation. The researchers evaluated social competence and anti-social behaviors using the Home & Community Social Behavioral Scale (HCSBS) and measured social skills, problem behaviors, and academic competence using the Social Skills Improvement System (SSIS). The findings of the study included a reduction in low-performance/high-risk skills. SSIS measures showed significant communication improvement, a significant decrease in hyperactivity, autistic behavioral tendencies, and overall problem behaviors. The results indicate that a music therapy program including improvisation interventions can be an effective means to promote social skills among school-aged children with limited resources.

Music improvisation experiences improve social skills by providing opportunities for different means of nonverbal communication including coordinated movement. A study of social collaboration in music improvisation among pairs of professional musicians found that each backing track brought the emergence of different coordination patterns while the musicians played together, moved together, and collaborated. Listeners' experience of audio recordings of the improvisations was related to how the musicians coordinated playing behavior and bodily

movements. Music improvisation experiences may provide insight into how social interaction emerges from the structure of a behavioral task (Walton et al., 2017).

Current theories in music cognition describe music as social in its production and its perception. A study exploring the perception of social and relational meanings in improvised music found that both musician and nonmusician listeners could recognize the improvised music's relational intentions (Aucouturier & Cannone, 2017). Music improvisations encourage players and listeners to engage social perception processes.

Communication Outcomes

Studies of music improvisation provide opportunities to explore nonverbal communicative behaviors. Edgerton (1994) investigated the effectiveness of improvisational music therapy, based on the Nordoff and Robbins' Creative Music Therapy Approach, to improve the communicative behaviors of children with autism. This study used the Checklist of Communicative Responses/Acts Score Sheet (CRASS) to measure musical and nonmusical communicative behaviors. The results of the study strongly suggest the use of improvisational music therapy in increasing the communicative behaviors of children with autism. Significant differences were found between the subjects' initial CRASS scores and those of the last session (Edgerton, 1994). Because of the rhythmic nature of the behavior of children with autism, the tempo may be a communicative modality that children with autism can use successfully. Michael Thaut also suggested the possibility of rhythm being absorbed on a physiological level and bypassing the cognitive deficits of children with autism (Thaut, 1980). Improvisational music therapy sessions have also reflected communication development among children with severe

disabilities (Perry, 2003). Turn-taking and playing and singing together were important means of communication demonstrated in music improvisation.

“Back-channel-ing,” is the idea that two simultaneous channels occur during a conversation: the speaker’s channel and the addressee’s response, or ‘back-channel.’ Back-channel cues-vocalizations, facial expressions, gazes, and gestures- involve responsive feedback to the speaker. Moran et al. (2015) explored nonverbal feedback, or back-channeling, by focusing on nonverbal feedback during music improvisation. Findings suggest that the perception of back-channel-ing in free improvisation is not dependent on music-specific skills but is a general ability. The findings invite further study of the links between interpersonal dynamics in conversation and musical interaction (Moran et al., 2015).

Emotional Outcomes

The literature suggests music improvisation provides insight into emotional experiences. The results of a study of emotional communicability in improvised music concluded that neither experience in therapy nor musicianship or gender of the improviser were connected to musical emotional communicability. Emotions reported as easy to express in everyday life were communicated more accurately than those difficult to express in everyday life. Music therapists decoded the improvisations' emotional content more accurately than non-therapists (Gilboa et al., 2006). Petrini et al. (2010) studied the perception of emotions in the sound and gestural signals of solo music improvisations. The audio signals of the improvisations dominated the visual signals in determining perceived emotions.

In addition to assisting with emotional expression, music improvisation experiences may reduce anxiety or negative emotional experiences. In a study investigating improvisation-assisted

desensitization on reducing music performance anxiety symptoms among student pianists, results showed statistically significant decreases in tension and Spielberger's State-Trait Anxiety Inventory (STAI) (Kim, 2008).

Music improvisation experiences may help improve emotion recognition and intelligence. The process of emotion recognition may be negatively biased among individuals with social anxiety disorder (SAD). A investigating happiness recognition training through musical improvisation for people with social anxiety disorder (SAD) found that the brief training improves the ability of individuals with SAD to recognize happiness in spoken language (Bodner et al., 2012).

Phenomenological Outcomes

Researchers have also conducted thematic analyses of music improvisation experiences. A phenomenological analysis of an improvisational music therapy program for cancer patients uncovered the following recurrent themes: group interaction/dynamics, self-confidence, relaxation, stress relief, positive feelings, forming a strong bond, free expression, communicating through music, emphasis on the importance of social interaction, and communication (Pothoulaki et al., 2012). These themes reveal many social and psychological benefits of improvisational music therapy.

Music improvisation experiences can provide music therapists important opportunities for reflection and personal development. Interviews with music therapists about the experience of self in clinical improvisation revealed five central themes: mindful meeting of equals, the importance of the fundamentals, flexibility and adaptability, personal fulfillment and, balancing

the professional and musical self. These findings support the idea of improvisation as a social discourse (McCaffrey, 2013), and a setting in which one can express the inner self.

Wilson & MacDonald (2016) explored musical choices during group free improvisation and found that improvisers chose to maintain what they were doing or change, either to initiate a new direction or respond to another improviser. Improvisatory responses were chosen to adopt, augment, or contrast the contributions of others. Participants based their choices on evaluation of texture, rate of initiatives, degrees of novelty and diversity, structural and practical concerns, and enjoyment. The social nature of the exchange influenced the choices made by improvisers.

Additional Outcomes

Improvisational music therapy (Pavlicevic et al., 1994) helped rehabilitate individuals with chronic schizophrenia by improving their clinical status and interaction with the music therapist. During music therapy sessions, individuals with schizophrenia had opportunities to engage in nonverbal interactions and develop their interactive capacities during music improvisation. Improvisation-based music therapy proved to be beneficial in a case study of a middle-aged woman with schizophrenia. At the start of treatment, the woman was described with a "lack of meaningful communication that also created problems with social interaction" (Næss & Ruud, 2007). During music therapy treatment, the woman showed interest in music improvisations and developing musical skills. As a result of music therapy treatment, the woman established more meaning in her life, developed relationships with family members, and gained interest in playing on her synthesizer. After many music therapy sessions, the woman became more focused, began making decisions and setting goals for her life (Næss & Ruud, 2007).

Music improvisation interventions may result in positive behavioral outcomes. An investigation of the musical characteristics of free improvisations of children with developmental disabilities found that children considered “musically inclined” produced more organized and sophisticated keyboard explorations. This higher level of musical structure was initially associated with fewer interfering behaviors and later associated with practice and spatial task performance (Orsmond & Miller, 1995). For adolescent boys with Attention Deficit Hyperactivity Disorder (ADHD), improvisational music therapy approaches reduced ADHD symptoms in the classroom (Rickson, 2006). Adolescent participants with ADHD in the music therapy treatment groups significantly improved accuracy on the Synchronised Tapping Task (STT). Teachers reported a significant reduction in Conners’ DSM-IV Total and Global Index subscale scores (Rickson, 2006). These results suggest improvement in a range of developmental areas, including motor impulsivity.

Additional benefits of music therapy outcomes include improved quality of life, improved mood, and a reduction in pain. Group music therapy treatment with mixed music interventions, including improvisation, resulted in statistically significant improvements on five items of the Abbreviated World Health Organization Quality of Life Scale for participants living with a severe and enduring mental illness (Grocke, 2009). A single electronic music improvisation session resulted in significant improvements in measures of pain intensity (VASPI) and mood (VASMOOD) for adults with Sickle Cell Disease (Rodgers-Melnick et al., 2018). Participants reported that music therapists provided comfort beyond the music.

Music improvisations may reflect intersections of multiple cultures and languages. Tomlinson (2016) explored how a young, multilingual student used music improvisation to form

a speech rap. The researcher concluded that prior multicultural music learning was crucial to assist the student's music improvisation to enhance communication across borders in local and global information societies. Through his music improvisation, the student demonstrated cognition and higher thinking skills.

DISCUSSION

Among the twenty-nine studies in this review, music improvisation experiences differed greatly in procedure, setting, participants, equipment, measures, and instrumentation. The music therapy-related studies exploring music improvisation also displayed contrasting theoretical frameworks, intervention designs, and experimental designs. The wide range of music improvisation procedures and theoretical frameworks employed in the studies makes it difficult for music therapists to discern effective improvisational techniques. To gather more information about the music improvisation techniques used by music therapists in the future, researchers may survey music therapists about the step-by-step procedures and equipment utilized during music therapy interventions. Most of the studies involved small sample sizes. Studies with larger samples are necessary to solidify the benefits and outcomes of improvisation experiences.

Many studies probing the neurologic correlations of music improvisation have focused on studying professional musicians or improvisers' brain activity. It would be useful to study the brain activity of clients engaging in music improvisation during music therapy interventions to better understand how music improvisation affects the brain in a music therapy context. It may also be useful to complete more neurologic studies involving nonmusicians since most music therapy clients do not have professional music training. Because there appears to be many communicative benefits of music improvisation experiences, it may also be helpful to further analyze communication centers of the brain during dyadic or group improvisations. Researchers may also analyze emotional centers of the brain as research suggests music improvisation communicates emotions. Further studies measuring plasma oxytocin and adrenocorticotrophic

hormone (ACTH) concentrations before and after music improvisation may provide insight into group improvisation's physiological benefits.

Future studies evaluating the social benefits of music improvisation may compare groups of improvisers who already have an established relationship to groups of improvisers who are strangers to consider the effects previously established relationships have on group improvisation's social effects.

Because music therapy programs including mixed interventions and music improvisation interventions have improved social skills among children with social deficits, it may be helpful to replicate the studies using only the music improvisation interventions to see if music improvisation interventions alone result in improved social skills. It may also be useful for music therapists to compare the effects of different music improvisation interventions. The instrumentation of improvisation experienced varied by study, and future studies may also compare the effects of improvisation interventions involving different instruments.

These articles did not include any studies focusing on the outcomes of improvisation interventions for individuals with a history of trauma or Post Traumatic Stress Disorder (PTSD). Verbal communication may be difficult for some individuals with a history of trauma, so the efficacy of music improvisation interventions may be studied when developing treatment interventions for trauma recovery.

Because music improvisation is spontaneous and unpredictable, it is challenging to outline the structure of an improvisation experience. In many of the studies in this review, descriptions of improvisation procedures were brief or vague. Some articles described the improvisation experience in length, while others did not clarify the nature of the improvisation.

In future research, it is essential for researchers to clearly describe the structure and procedure of music improvisation experiences so studies may be replicated. If the study pertains to music therapy treatment, the researcher needs to describe music improvisation interventions in detail so that the methods may be transferred to practice by clinicians. "Reporting Guidelines for Music-based Interventions" (Robb et al., 2010) may be a good starting point for writing detailed descriptions of music improvisation experiences, especially those in a music therapy context.

LIMITATIONS

Due to time constraints, the researcher could not include all relevant articles addressing music improvisation outcomes. Many other studies exist regarding music improvisation, and a systematic review of music improvisation experiences is recommended to provide further insight into the benefits and results of improvisation experiences. The researcher found it difficult to quickly synthesize and categorize data due to the large size and complexity of the data summary table created for data collection on Google Sheets/Microsoft Excel. In future studies, the researcher would redesign and simplify the data summary table created on Google Sheets/Microsoft Excel to make it more user friendly, organized, and visually accessible.

CONCLUSIONS

Music improvisation experiences may contribute to many positive social and psychological benefits. The neurologic outcomes of the studies included in this review suggest that improvisational music training can influence the brain's neural networks. Expertise in improvisation may involve the deactivation of the right dorsolateral prefrontal cortex (r-DLPFC), a brain area associated with executive processing (Rosen et al., 2016). Physiological outcomes of music improvisation experiences include higher oxytocin levels during an improvised condition than a pre-composed music condition, which may be due to improvisation's social effects.

Music therapy treatment involving music improvisation interventions has improved social skills among children and adolescents with social deficits. Music improvisation in dyadic and group settings is a social experience and can assist in building relationships. Improvisers engage in nonverbal communication through gestures, movement, and facial expressions. Relational intent can be perceived while listening to or observing improvisers. Improvisational music therapy may increase the communicative behaviors of individuals with autism or other developmental disorders. Emotions can also be perceived and communicated via music improvisation. Phenomenological research of music improvisation experiences has revealed numerous social and psychological benefits of improvisation. Other outcomes of music improvisation experiences include mood improvement, pain reduction, increased quality of life, and behavioral improvements. Results of this scoping review suggest that music improvisation experiences can be used in music therapy treatment to address clients' social, communication, behavioral, and emotional needs. More research of music improvisation experiences is necessary to further develop evidence-based improvisational music therapy techniques.

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