The Connected Music Therapy Teleintervention Approach (CoMTTA) and its application to family-centred programs for young children with hearing loss

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In plain language:

For families living in rural and remote areas, access to music therapy services facilitated by a qualified music therapist may be difficult or even impossible to find. The use of music therapy via video conferencing is an area of growth which seeks to address this need. This article outlines the Connected Music Therapy Teleintervention Approach (CoMTTA) and how it was applied across three different models for children with hearing loss and their families. The participant feedback and discussion sections highlight the need for further practitioner research within this field, particularly focused toward group work in order to develop this approach.

Exploratory project

The Connected Music Therapy Teleintervention Approach (CoMTTA) and its application to family-centred programs for young children with hearing loss

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Abstract

The use of real-time video conferencing platforms in providing health and therapeutic services is increasing, bringing potential access, financial, and time advantages. Music therapy services are beginning to enter this space and are exploring the efficacy of interventions delivered through these platforms. Due to an opportunity to undertake a collaborative teleintervention project with children with hearing loss and their families, a need was identified to consider how this technology could be used in group settings. This led to the development of the Connected Music Therapy Teleintervention Approach (CoMTTA) which incorporates the following four areas: 1) delivery models; 2) session plan framework; 3) technology practice features and 4) additional considerations. In this paper, the features of CoMTTA are detailed and explored through the description of implemented delivery models, the author practitioners' observations, and evaluative feedback received from participating families and collaborating service provider staff. Benefits highlighted by this initial implementation of CoMTTA include accessibility to services not available to families in their location, reduced isolation experienced by families in rural and remote areas, and an observed high level of parent/carer-child interaction and parental skill development. Challenges range from technological issues encountered by service providers and families, through to potential obstacles in the development of the therapeutic relationship caused by communication difficulties, further impeded by the hearing difficulties experienced by the children. It is recommended that further practitioner research be undertaken within this field, particularly focused toward group work in order to develop this approach.

Key Words: teleintervention, telehealth, music therapy, family-centred, children, hearing loss

Introduction

The provision of healthcare and therapeutic services via real-time video conferencing platforms is an area of current interest to health and government bodies, and includes a focus on delivery within a number of international regions (Hufton, 2016; Mauco, Scott, & Mars, 2018; Olson & Thomas, 2017). Advantages to the utilisation of online health and therapy delivery models may include increased reach and level of comfort for

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clients, and greater access to expert service provision. There is also the potential for a decrease in travel time and delivery costs for clients and funding bodies (Blaiser, Behl, Callow-Heusser, & White, 2013; Jennett et al., 2003). A range of potential challenges and implications for clients using telehealth services are being noted in the literature with regards to accessing practitioners, operating the technology, developing therapeutic rapport, and issues with payment for services. In addition, there are considerable ethical and privacy issues to be considered (Kaplan & Litewka, 2008; Woottin, 1996).

The provision of music therapy via video conferencing platforms is an emerging field of practice, requiring collaboration and investment by service providers and clients to navigate the challenges inherent in this form of service delivery. There is currently scant literature on this topic within the music therapy profession, and writings specifically on the use of video conferencing approaches in group-based family-centred programs are even more limited. Due to this, a need was identified to develop models of delivery and practice considerations to implement a collaborative project in providing group-based music therapy programs to children with hearing loss and their families via teleintervention. This led to the development of the Connected Music Therapy Teleintervention Approach (CoMTTA) which is outlined and explored within this article.

Background

Overview of teleintervention.

The terms telehealth, telemedicine, telepractice, teletherapy and ehealth are used within the literature in what appears to be an interchangeable way to describe the application of online technology to providing health or therapy intervention services for clients with specific health issues or developmental focus areas. Service providers and funding bodies have adopted terms that reflect the needs of their practice, based on discipline areas, population groups and geographical regions (Fatehi & Wootton, 2012). The term "teleintervention" (TI) is most often referred to within the literature in relation to early intervention services that are provided to children with hearing loss via the application of information and communication technology (ICT) platforms (Havenga, Swanepoel, Le Roux, & Schmid, 2017; McCarthy, Muñoz, & White, 2010). Throughout the main body of this article, the term TI is used due to the focus population being children with hearing loss.

Positive outcomes of TI, including increased levels of family engagement in psychoeducational programs and self-reported reductions in mental health symptoms for people with post-traumatic stress disorder, have been reported (Miyahara, Butson, Cutfield, & Clarkson, 2009; Turgoose, Ashwick, & Murphy, 2017). Furthermore, evidence exists indicating no statistical differences in client satisfaction during psychological therapies delivered via face-to-face and TI modes within a randomised control trial with veterans (Turgoose et al., 2017).

In some cases, there have been unexpected reported benefits of TI over face-to-face delivery. For example, in one article on teleintervention for children with hearing loss it is stated that "the most significant benefit reported by families was that TI facilitated family engagement during sessions and put the family in the driver's seat" (Blaiser et al., 2013, p. 6). This statement suggests that when the therapist is in a different geographical location to the family, the parent/carer potentially has more of an opportunity to

direct the course of the sessions by playing the lead role in facilitating the therapeutic activities and strategies.

Challenges with the technological aspects of facilitating TI are also evident (Jang-Jaccard, Nepal, Alem, & Li, 2014; Olson & Thomas, 2017). Disruptions and problems encountered during TI can have a negative impact, particularly with clients who are difficult to engage (Woottin, 1996). Latency, the delay between auditory/visual signals from one end being received at the other, is a significant challenge, particularly when using interventions that seek to achieve synchronous interaction and involvement (Baker & Krout, 2009; Lightstone, Bailey, & Voros, 2015; Willis, 2018).

The Australian context.

The provision of online therapeutic and healthcare services in Australia has been influenced by world trends, current research, and national government funding policy changes, resulting in an increase in the use of TI delivery models (McGilvray, 2013; Moffatt & Eley, 2010). The distances from many rural towns to capital cities within Australia make access to basic and specialist or allied health services prohibitive, and as a result evidence suggests poorer health for rural and remote Australians (Frost & Sullivan, 2015).

The advantages of TI for Australians living in outlying areas can be seen as twofold. First, participants can potentially experience benefits through direct telehealth consultations with health professionals, and second, the quality of face-to-face consultations in rural and remote areas may improve given local health professionals can receive upskilling through various telehealth programs (Moffatt & Eley, 2010). Challenges experienced by Australian-based practitioners providing health and therapy services to

clients are similar to those reported globally, perhaps with increased barriers regarding internet connectivity (McGilvray, 2013). However, with the ongoing rollout of the National Broadband Network (NBN) across Australia, and other ICT advances, it is predicted that these difficulties will be reduced over time (Jang-Jaccard et al., 2014).

Australian data indicates the high potential of TI approaches for children. For example, Fairweather, Lincoln, and Ramsden (2016) describe a project on the delivery of speech-language teletherapy services to children attending educational services in rural and remote Australian locations, with an emphasis on the role that teletherapy can play in providing equity of health services. Through a mixed methods approach, the researchers examined the "effectiveness, feasibility and acceptability" (p. 594) of this delivery method, finding that several positive themes emerged including the practicality and convenience of teletherapy and the learning benefits that took place for the children participating.

Music therapy and teleintervention.

There are a small number of music therapy studies that have examined and reported on the use of video conferencing technology to conduct sessions with clients. Baker and Krout (2009) investigated the participation of an adolescent with Asperger's Syndrome undertaking a songwriting intervention via video conferencing. This study highlighted the unexpected benefit of increased social interaction and engagement during the video conferencing sessions in comparison to face-to-face delivery. This was evidenced by more instances of eye contact, laughing, and smiling. In addition, the authors observed a higher level of creative output and longer periods of engagement by the participant during the video conferencing sessions. Social

connection is also a goal within a current group singing telehealth research project being carried out by The University of Melbourne for people with quadriplegia (Willis, 2018). In addition, a case study involving video conferencing technology in delivering remote music therapy services to a military veteran, addressing symptoms of post-traumatic stress disorder, indicated its efficacy in achieving treatment outcomes and allowing the music therapists to work collaboratively with other professionals (Lightstone et al., 2015). Presentations by Fuller and McLeod (2016; 2017) at Australian and international music therapy conferences highlighted how the use of TI with young children with hearing loss and their families improved access to music therapy and facilitated social connectedness.

Music therapy and hearing loss.

Young children with hearing impairments have considerable obstacles to overcome in order to be well placed to meet age appropriate developmental milestones. There is a growing body of literature on using music therapy to develop auditory, speech/language and emotional skills with people with hearing loss (Gfeller, 2007; Gillmeister & Robbins Elwafi, 2015; Radbruch, 2001; Salmon, 2008; Ward, 2016). The importance of carefully planning activities to meet the specific needs of children and being aware of the challenges some may experience with multi-layers of sound is highlighted (Gfeller, Driscoll, Kenworthy, & Voorst Van, 2011). Within Australia, there are a range of organisations, educational institutions and music therapists in private practice that are delivering group and individual music therapy services to people with hearing loss (Jack et al., 2016).

Family-centred music therapy.

The family-centred approach across the lifespan has been well represented in the music therapy literature in recent years (Creighton, 2011; DeLoach, 2018; Freeman, 2017; Jacobsen & Thompson, 2017; Teggelove, Thompson, & Tamplin, 2018). In adopting a family-centred approach, the music therapist is seen as a collaborator with the family members, where the delivery of each session is tailored to the individual needs of the families within the group. The interactions between the parent/carer-child are prioritised over any therapist-child interactions and the awareness of the importance of not disrupting attachment is at the fore (Ettenberger, Rojas Cárdenas, Parker, & Odell-Miller, 2017; Jacobsen & Killén, 2014). This family-centred philosophy underpins the development of an innovative approach which will now be outlined.

Method
Context.

The development of the Connected Music Therapy Teleintervention Approach (CoMTTA) transpired as a result of a collaboration between a service provider that supports children with hearing impairment, and a family-centred music therapy program. The service provider approached the authors to deliver music therapy to their rural and regional clients via TI. The service provider had already been utilising TI in providing listening and spoken language therapy, and educational support to their clients. In addition, they had previously collaborated with the author practitioners in providing face-to-face music therapy group sessions in their various metropolitan-based centre locations.

The developed teleintervention music therapy models were applied to four different situations based on the needs and locations of the clients; the locations and availability of the music therapists; and the preferences of the

service provider factoring in their program requirements, budget and practice experience. In each delivery format, the sessions were conducted by a Registered Music Therapist (RMT) with the Australian Music Therapy Association, supported by a Listening and Spoken Language Specialist (LSLS) from the service provider. The video conferencing platform used in all models was Lifesize©, which combines both software and hardware in a cloud-based video conferencing system. The hardware used by the TI host included a conference room camera, microphone base and large screen. Participants joined the TI sessions by accessing the downloaded software on their own computer or other device (Lifesize Inc., 2018).

Families referred all had a child with hearing loss and were currently receiving services from the provider to support goal areas such as listening, language, social skills, daily living skills and literacy skills. Some of the focus children attending had received cochlear implants or hearing aids. Written consent was obtained from the collaborating service provider for the following participant and program information to be published in a de-identified format. Consent from the participants for their contributions to be shared anonymously for the purpose of building the music therapy professional knowledge-base was made verbally to the collaborating organisation staff. In addition, participant consent is implied through the voluntary provision of their written responses on the feedback form at the end of the program. As the evaluation of this project was focused on program quality assurance, approval from an ethics committee was not sought.

Design.

Evidence-based practice (EBP) as outlined within current literature informed the development of CoMTTA. The three key areas that form EBP are: high quality research and literature; the practitioner's practice knowledge; and the client's own values and resources. In some literature on EBP, information from the practice context is included as a fourth key area (Hoffmann, Bennett, & Del Mar, 2013; Saunders, 2015). These key areas are balanced in importance, with no single area being elevated above the other areas (Kitson, 1998; Rycroft-Malone, 2004). For this project, information was integrated and interpreted from the key literature and research areas including teleintervention, music therapy, hearing loss, and family-centred practice. The authors' practitioner knowledge was utilised given their extensive experience in providing group music therapy using a family-centred approach. The musical preferences, areas of interest, cultural backgrounds and values of the parent/carer-child dyads were integrated into the project planning and evolved as the weeks progressed, as was the information provided by the collaborating service provider with regards to therapy approach and philosophy, and symptomatology of this population group. In addition, a resource-oriented approach was taken with regards to respecting each family's knowledge, their goals for music therapy sessions, and their personal and collected resources that they contributed to the music-making (Rolvsjord, 2010). Therapists strived to balance their input and the session structure framework while supporting participants to have agency over the outcomes of their music therapy experiences.

CoMTTA was developed around the theme of connection. It provides family members (e.g. parent/carer-child dyads) with the opportunity to connect through developmentally targeted music therapy

activities. Families connecting with each other is seen as another focus, given that in remote locations it may be difficult for them to interact with others who are also experiencing the challenges of having a child with hearing loss. The connection of families who live in rural and remote areas to music therapy services facilitated by a qualified music therapist is also seen as a beneficial outcome.

CoMTTA was developed with the following focus areas: 1) delivery models; 2) session plan framework; 3) technology practice features and 4) additional considerations (Figure 1).

Figure 1. *The Connected Music Therapy Teleintervention Approach (CoMTTA) focus areas*
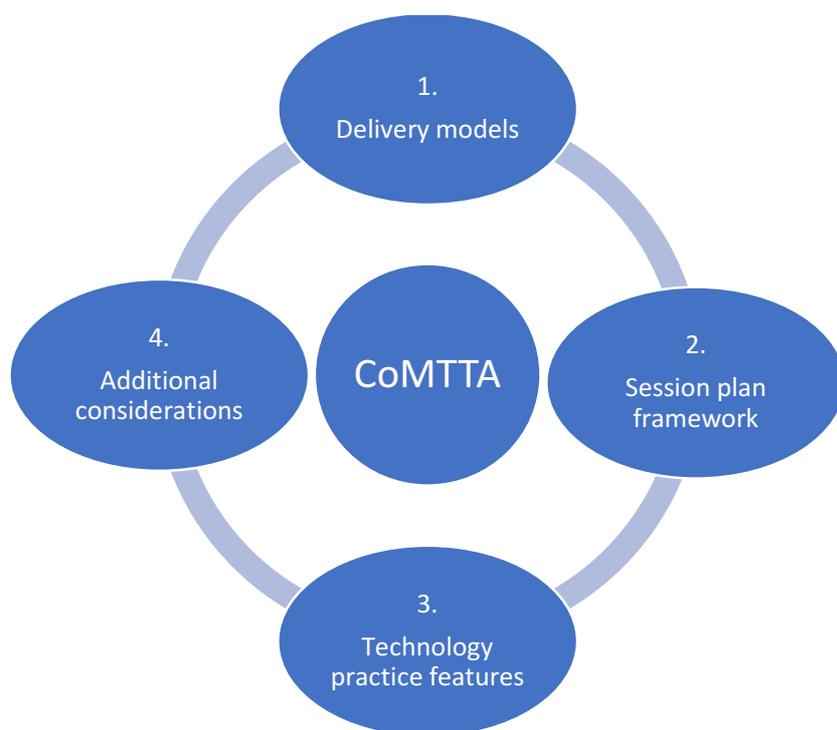
1) CoMTTA delivery models.

Specific models of delivery were identified and developed for families with young children (Table 1). These allowed for different configurations of the location of families, service provider staff and RMTs, as well as an option for delivering sessions both face-to-face and via TI.

2) CoMTTA session plan framework.

The session plan framework (Table 2) is viewed as a guide for music therapist practitioners utilising the model, and it is envisaged they will apply an "improvisational attitude" (Arnason, 2003, p. 133), following the lead of the participants as opportunities arise. The overarching goals within this framework are to encourage positive parent/carer-child interactions and support early learning and child development as further delineated in Table 2. Additional goals identified by families and/or service providers will also guide the interventions used within this framework. Within parent/carer-child programs, the authors also believe that due consideration should be given to how parent/carer-child fun can be achieved through shared music-making. The expression of enjoyment by both the child and

parent/carer is seen as a cogent contributor to maximising interaction, engagement and weekly attendance, therefore this is intentionally woven throughout the session plan framework. Other session plan elements include: flow; repetition and variation; transitions; instruments and props; and dialogue. This session plan framework was developed to be utilised across each of the three models of CoMTTA, with the music therapist facilitating an adapted delivery as required.

Table 1.
CoMTTA delivery models

Model	Description
Workshop Model	The music therapist facilitates a one-off TI music therapy workshop from one location in a teleconference enabled space, while families are together with the service provider in another location.
Weekly Model	The music therapist facilitates weekly TI music therapy sessions across a 6 to 8 week period, with each family in their own homes in various locations across regional areas, while the music therapist is located in a teleconference enabled space.
Mixed Model	The music therapist facilitates weekly music therapy sessions across a 6 to 8 week period. The first and final sessions are delivered face-to-face at the service provider facility. Remaining sessions are delivered via TI with the music therapist located in a teleconference enabled space, and the families together in another location.

Table 2.
CoMTTA session plan framework

Activity	Objectives and Skills Examples	Additional Information
Greeting Song	Social interaction; joint attention; verbal and non-verbal communication skills	Children are encouraged to greet each other and adults in the group
Action Songs	Fine motor; crossing midline; cognitive function; rhythmic regulation; interaction	Props and supported visual aids may be utilised as required
Musical Instruments	Creativity; auditory discrimination; bilateral coordination; fine motor; turn-taking	Instruments utilised include maracas, bells, sticks, whistles and recorders
Dancing/ Movement	Gross motor; rhythmic regulation; coordination; social interaction; expression	Children and adults are encouraged to dance/move rhythmically and freely
Drumming	Imitation; bilateral coordination; volume control; cognitive concepts; exploration	Drums with and without beaters are utilised within structured and improvised activities
Familiar Songs	Verbal expression; sequencing; turn-taking; interaction; cognitive concepts	Props may be utilised, including soft toys, scarves and visual supports
Relaxation Time	Attachment and bonding; self-regulation; body awareness; emotional concepts	Children are encouraged to sit and engage with their parent/carer
Goodbye Song	Social interaction; self-regulation; auditory attention and discrimination	Children are encouraged to farewell each other and adults in the group

3) CoMTTA technology practice features.

The technology practice features chosen for use and consideration within the delivery of CoMTTA can be categorised into two areas: before program considerations, and during session considerations. These areas are described within Table 3 below.

Table 3.
CoMTTA technology practice features

Timeframe	Technology Practice Features
Before Program	• Families are asked to conduct an online 'speed test' at the proposed time of program on 2 or 3 days, and email the results to the host organisation • Families are given information regarding considerations for the location of their computer screen during sessions • The music therapist has an orientation to the equipment approximately one week prior to the program or workshop starting date • Enrolment form/survey link and other information is sent to families via email prior to the program starting
During Sessions	• Prior to the session starting, the screen for the music therapist is set to gallery view so that all participants can be viewed on screen • At the start of the first session, families are encouraged to try the different views available on the video conferencing platform being used • An action plan is discussed to follow in the event of internet issues arising • A brief explanation on how to use the 'mute' functionality of the software is given, and this is tested with each family • In considering audio load, the music therapist is aware of the layering of sounds, and attempts to balance vocal and guitar/keyboard volume level • In considering video load, the music therapist is aware of minimising fast, large repetitive movements and considers the angle and focus of the camera in the planning and set-up of the sessions • The co-facilitator models playing instruments and creating body percussion rhythms prior to the activity starting, and then plays very softly or pretends to play once everyone joins in

4) CoMTTA additional considerations.

In delivering group music therapy sessions for families with young children via TI, additional approach considerations included: the provision of instruments/props; the use of aided visual supports; the delivery of dialogue/narrative by the music therapist; the role of the co-facilitator; and the provision of an online portal providing resources for families.

For the workshop model, the collaborating service provider was responsible for supplying the instruments and props needed for the group. This equipment may be made, purchased or borrowed for use. For the weekly model, a list of instruments and props was provided to families well in advance of the first session, giving them time to make, purchase or borrow the required items (Table 4). In addition, an information page with suggestions for the smooth running of the sessions was provided to families. For the mixed model, a full music therapy kit that included instruments, props and visual

aids was supplied by the music therapy provider.

Consideration was given to the use of aided visual supports, specifically with regards to a session schedule. As the TI experience involves both audio and visual streaming, a flip-book photo schedule was used by the music therapist for the workshop and weekly models, and the same schedule was provided within the kit for the mixed model.

Within each model the collaborating organisation provided a staff member to assist in the facilitation of the music therapy sessions. The co-facilitator assisted mostly by modelling actions and demonstrating the playing of the percussion instruments. Spoken interactions from the co-facilitator were utilised when modelling or role-playing, though these were kept to a minimum in most cases.

Another aspect to family-centred practice is that the use of music by families throughout their weekly routines is encouraged (Jacobsen & Thompson, 2017). In order to support families and build capacity for them to utilise music at home, a password-protected online family portal was developed with song lyric sheets, audio visual song recordings, craft templates and general music therapy information provided.

All models required additional considerations to be made as relevant to the specific participant group. In utilising CoMTTA with children experiencing the developmental and social challenges associated with hearing loss, specific consideration was given to activity delivery. For example, a method to promote hearing skill development identified by the service provider was to give opportunities for the children to hear a sound or a descriptive word before seeing an object or picture. Songs used in sessions were therefore modified or created

to meet this need. Due to the potential communication issues between the music therapist and the participants with hearing loss, information was also gathered from the service provider and relevant literature with regards to the most effective way to approach speaking with participants during the delivery of the sessions (National Center for Hearing Assessment and Management, 2018; Salmon, 2008). Music therapists facilitating these programs were required to be highly intentional regarding their verbal and non-verbal communication. This included their use of pitch, the timing and pace of their spoken words, the number of words they used, the spacing between questions and replies, and their use of facial expressions and gestures.

Table 4.
List of instruments/props for weekly model

Item	Examples
Instrument to Shake	Maraca, egg shaker, rattle
Instrument to Tap	Rhythm sticks, clave, chopsticks
Instrument to Bang	Drum, tambour, tambourine, pots/pans
Instrument to Blow	Recorder, horn, party whistle, harmonica
Fabric Prop	Scarf, ribbons, sarong, tablecloth
Toy Prop	Teddy bear, stuffed dog/rabbit, soft doll

Implementation
  CoMTTA workshop model.
  The first model involved conducting a one-off workshop via TI with families who were attending a residential weekend in another capital city (1600 kilometres away). At the residential venue there were five service provider staff members present with ten families in a room with a large TV screen, camera and speakers. Two RMTs co-

facilitated the workshop from a TI-enabled space provided by the collaborating organisation. In addition to the previously outlined CoMTTA session plan framework goals, songs for undertaking daily routines such as getting dressed and brushing teeth were included. The RMTs utilised puppets and visual aids (which were held up close to the camera for ease of viewing), and incorporated dancing and movement songs that required no instruments or props. The session lasted approximately 45 minutes.

CoMTTA weekly model.

The weekly model involved the provision of six weekly sessions in a block with facilitators in one location, and each family participating from their own home in various locations. Two blocks were held with different families involved each time. In each weekly session, the music-making lasted approximately 45 minutes. A parent or grandparent for each child joined in the weekly sessions in order to provide functional support, operate the technology hardware/software and model music-making participation. When present, siblings were also included and provided group members with further opportunities for social skill development.

Each session commenced with open welcoming dialogue and ended with the RMT and LSLS facilitating a brief reflective discussion with the families on what had occurred during the session.

Program 1. The first of these programs was run from the service provider's northern centre location and was facilitated each week by an RMT and an LSLS. The families attending this program comprised of: a 3-year-old female and her grandmother; a male aged 2.5 years with his mother and male sibling aged 6 months; and a 5-year-old female with her mother and male sibling aged 3 years. All

families attended on most weeks and activities delivered followed the CoMTTA session plan framework (Table 2). A unique activity to promote hearing skill development emerged within the context of the music-making during Program 1 and was also used within Program 2. The created song "What's That Sound?" supported this goal. The lyrics are as below:

What's That Sound?
Hey, hey, what's that sound?
Hey, hey, what have we found?
Hey, hey, listen dear
Can you tell me what you hear?

This simple song was played on guitar by the RMT using a bouncy 4/4 rhythm in the key of D and delivered utilising cadences, tempo and melodic intonation to elicit engagement.

It is interesting to note that during the final session of this weekly model, the 3-year-old girl was unwell with a cold. Her grandmother reported that although she was sick, she was still insistent on attending her music therapy session. She could be seen via the TI screen to be coughing and was perhaps less animated than previous weeks, but appeared pleased that she could still join in the music-making. In face-to-face programs, attendance in this situation would not have been possible.

Program 2. The second program was run from the service provider's central centre location and was facilitated each week by an RMT and an LSLS. Four families registered for the program, comprising of one interstate family, one family from a regional area and two locally based families. The children with hearing impairments ranged in age from 2 to 4.5 years. They were accompanied by either one or both parents and other siblings. On average, 2-3 families participated each week.

While the session plan framework was generally followed (Table 2), targeted music

activities that utilise well known traditional children's songs were included in various modified formats throughout this program. For example, the verses of the action song "If You're Happy and You Know It" were changed to promote the development of listening and attention skills, and to provide opportunities for family interactions such as through tickling and cuddling. In another instance, a family pet was incorporated into the singing of "Old MacDonald Had a Farm". The other children and parents were observed to enjoy this moment as evidenced by finger pointing to the screen, smiles, and laughter. Modifications to the session structure were made in the moment based on requests by families. For example, the children of one family had made ribbons to dance with during the week, and so a dancing song was incorporated into the session in place of another movement song previously planned.

CoMTTA mixed model.

The third model involved both face-to-face and TI formats across a five-week program. The RMT was physically present in the therapy room with families for weeks one and five, while all other sessions were conducted via TI with the families meeting in one physical location together and the RMT facilitating from another location. The LSLS was present face-to-face with the families each week to operate the equipment, assist with the instrument kit, and to model each activity.

A total of ten families attended the program, however attendance fluctuated considerably, with no family attending for all of the five weeks. Four families attended one session only, and just four families experienced both face-to-face and TI formats. The session followed a similar structure each week (Table 2), with some slight variations in songs used. In week two the visual display at both locations did not work. The session went ahead with only audio communication available. Several new families attended this session, and some families did not return in subsequent weeks. The equipment functioned properly with both visual and audio working for the remaining TI scheduled weeks.

Participant Feedback

Feedback from participants and staff involved in each of the CoMTTA models was obtained either through incidental verbal feedback or from evaluation forms completed in hard copy or online. The evaluation form consisted of closed questions utilising a Likert-type scale (Likert, 1932) and a series of open-ended questions to elicit participants' experiences and suggested improvements.

The workshop model sought incidental verbal feedback from the staff at the conclusion of the session. The staff indicated the families engaged well in the workshop, playing instruments, performing actions, attending to questions, and singing along with the familiar songs.

Families who participated in the weekly models were emailed a link to complete the evaluation form online. Feedback included a comment about the audio difficulties, with one mother saying that *"muting helped the quality of the sound."* Another parent noted the challenge of meeting the individual needs of clients within a group setting (with the added aspect of TI). One parent expressed a wish for more families to join in the program to allow for increased modelling opportunities across the group of children. One mother said *"It is a six-hour round trip for us to our local [service provider centre]. We would not have otherwise participated in music therapy if it were not via teleintervention."* She also stated that the program had encouraged her to use music with her children more often: *"My girls*

have been singing and dancing at home a lot more. I have been encouraging singing and songs." Another parent indicated that she felt her daughter engaged in the sessions more and was less self-conscious than she would be in a face-to-face group setting. Feedback from the staff included this comment: *"The therapists were really flexible and receptive with ways to integrate auditory verbal strategies into [the programs]."*

For the mixed model, families noted the challenges that arose due to the technical difficulties in week two. Several parents found having access to the instruments, props and visual aids that were provided motivated their child's participation. Both staff and families indicated they found it difficult if a song was unfamiliar to them, with one mother explaining that known songs enabled them to participate more easily. One mother with a 2-year-old commented that her child participated more fully in the face-to-face sessions rather than via TI.

Discussion

The application of CoMMTA highlights numerous benefits and challenges in the three models, as evidenced by the experiences and observations of the RMTs and feedback received from staff and participating families. One of the key goals of CoMTTA is to encourage parents/carers to engage with their children. With the RMT not being physically present in the room, the level of parent/carer-child interaction and hands on music-making was observed by the RMT and LSLS to be high, particularly in the weekly model. Through modelling and modification of the session structure, the RMT was able to support parents in using resources available to them. The examples in the weekly model of families incorporating a family pet and homemade props into the session reflects the resource-oriented focus inherent in this approach. This observation is echoed by Blaiser et al. (2013) who found the use of TI increased parents' participation and skill development. During the session, parents had opportunities to practice valuable skills which may have increased their confidence in being able to implement music activities with their child throughout the week. Parents' reports of using songs more often as a result of participating in the TI program support this. It is not clear if the same extension of skills occurred with families in the workshop and mixed model, however the high level of parent/carer participation during sessions was noted by the RMTs in comparison to their practice experience in face-to-face group sessions. The role of TI in promoting more extensive parent/carer-child interaction and parental confidence in using music warrants further investigation.

One of the main benefits of utilising TI approaches is increasing accessibility to therapeutic services for clients, particularly for those in rural and remote areas. This notion is supported by the comments made by parents who indicated they would not be able to access music therapy services for their child had it not been for the availability of this TI program. It is interesting to note that in Program 2 of the weekly model, several families from the same capital city as the service provider also participated. This highlights that accessibility issues can also affect those living in reasonably close proximity, compounded by transport issues and the families' schedules. Additionally, the instance of the sick child attending the weekly program highlights a potential advantage of TI over face-to-face models where illness may prevent attendance.

CoMMTA focuses not only on each individual families' accessibility to music

therapy, but also connection with other families. This is particularly pertinent to families in the weekly model who are physically isolated from other families. The desire for connection is referenced by one mother's comment about wanting more families to be involved. The level of engagement and relationship between the families may be influenced by the number of families participating in TI sessions. While the capacity of the technology allowed for a greater number of participants, with increased family numbers, the visual display of each family would have been smaller and potentially more difficult to see, and the opportunity to contribute to discussions may have been reduced. Further investigation into the use of TI in group interventions is required to determine the optimal number of participants to balance the need for the families' connection with each other, thus reducing their sense of isolation, as well as the therapeutic effectiveness of interventions.

The strength of the therapeutic relationship between music therapist and families in group music therapy is one factor influencing the effectiveness of these interventions (Bruscia, 2014; Mössler et al., 2017). Significant differences were observed in the extent to which the therapeutic relationship was developed in each of the CoMTTA models. There were more opportunities for establishing the therapeutic relationship in the weekly model due to smaller group size, and the ability to interact and be responsive to each family directly. In contrast, the development of the therapeutic relationship was compromised in the workshop and mixed models as there was limited to no dialogue with the families, and little to no direct eye contact. This did not appear to significantly impact the effectiveness of the workshop model or the establishment of therapeutic

rapport, as the level of family participation was observed to be high. However, in the mixed model, the sense of distance between the RMT and families during TI sessions was compounded further by technical issues and fluctuating attendance of families. The experience may have differed if attendance was consistent across all sessions, with the foundation for building a therapeutic alliance laid in the first face-to-face session, and subsequently built upon in the following TI sessions.

The comment made by the mother about her child participating more in face-to-face formats than via TI confirms another difficulty with connection and engagement. In face-to-face group therapy sessions, RMTs rely significantly on being able to respond 'in the moment' to what is happening in the room. Latency issues with TI can interrupt the flow of a session when there are pauses to receive auditory and visual feedback, reducing the immediacy of response. This produces a sense of distance, particularly in group settings, which may impact attention, focus and strength of therapeutic rapport. These identified variables and issues warrant further implementation of these models to evaluate efficacy where the RMT is remotely conducting sessions with a group of families attending together in another location.

The failure of the visual display encountered in week two of the mixed model highlights one of several significant challenges in using TI in a therapeutic session. This may provide context and reasoning for the fluctuating attendance of families to this model. Visual and audio quality at times made even basic exchanges difficult, requiring patience and persistence from all parties. The picture quality sometimes froze or became pixelated. On occasions, the sound became distorted, dropped out or was cacophonous

when all participants were playing instruments. The significance of sound quality issues is even greater in this context of working with children with existing hearing impairments. To address this, the strategy of families using the microphone mute function on their computer or device was implemented for both weekly model programs. Families were advised to keep their microphone muted except when they needed to speak, sing or play their instrument for the group. The parent feedback indicated that it was effective in decreasing the extraneous sounds and improving sound quality. Having parents/carers present with their child to help reinforce any messages that may otherwise be lost due to sound quality is imperative to enhancing communication. As TI approaches are increasingly used in personal and professional spheres, and as improvements are made in TI technologies, it is anticipated the current challenges may be reduced. Such changes will result in the ongoing refinement and development of CoMTTA and other related approaches.

Conclusion

The increasing use of video based conferencing platforms in delivering health and therapeutic services presents opportunities and challenges for music therapists who wish to enter this field of practice. The opportunity to develop, implement and evaluate CoMTTA in using teleintervention to deliver group music therapy to children with hearing loss and their families has provided further insight into the benefits of this approach and the difficulties that may be faced.

The one-off workshop model enabled parents to practice skills in using music with their children in a group setting. The implementation of two weekly models

highlighted benefits of accessibility to services and reduced isolation experienced by families in rural and remote areas. Furthermore, staff observations and family feedback suggested that the level of parent/carer-child interactions was high, as parents/carers were required to be 'hands on' in facilitating their child's participation in music-making. Challenges with regards to clear visual display, sound quality and latency needed to be managed and worked through by both the families and therapists to reduce interruptions to the flow and experience of the sessions. The delivery of the mixed model met the most challenges, with technical failures and subsequent fluctuating attendance interrupting the development of therapeutic rapport and family engagement in therapy. Further uses of this mixed model are needed to identify if the technological difficulties and specific group context and make-up solely contributed to less engagement and participation, or if this model in itself is not conducive to effective therapeutic outcomes. It is evident that more rigorous investigation and use of CoMTTA is required to test and validate the applicability of this approach. Areas for further investigation include the benefits and disadvantages of each model, the optimal group size, and the most effective use of technology.

References

Arnason, C. (2003). Music therapists' listening perspectives in improvisational music therapy: A qualitative interview study. *Nordic Journal of Music Therapy, 12*(2), 124-138.

Baker, F., & Krout, R. (2009). Songwriting via skype: An online music therapy intervention to enhance social skills in an adolescent diagnosed with Asperger's Syndrome. *British Journal of Music Therapy, 23*(2), 3-14.

Blaiser, K., Behl, D., Callow-Heusser, C., & White, K. (2013). Measuring costs and outcomes of tele-intervention when serving families of children who are deaf/hard-of-hearing. *International Journal of Telerehabilitation, 5*(2), 3-10.

Bruscia, K. E. (2014). *Defining music therapy* (3rd ed.). University Park, IL: Barcelona Publishers.

Creighton, A. (2011). Mother-infant musical interaction and emotional communication: A literature review. *Australian Journal of Music Therapy, 22.*

DeLoach, D. (2018). Music therapy family practice building capacity in parents of children with Autism Spectrum Disorder. In P. Kern, & M. E. Humpal (Ed.), *Early Childhood Music Therapy and Autism Spectrum Disorder: Supporting Children and Their Families*: Jessica Kingsley Publishers.

Ettenberger, M., Rojas Cárdenas, C., Parker, M., & Odell-Miller, H. (2017). Family-centred music therapy with preterm infants and their parents in the Neonatal Intensive Care Unit (NICU) in Colombia – A mixed-methods study. *Nordic Journal of Music Therapy, 26*(3), 207-234.

Fairweather, G. C., Lincoln, M. A., & Ramsden, R. (2016). Speech-language pathology teletherapy in rural and remote educational settings: Decreasing service inequities. *International journal of speech-language pathology, 18*(6), 592-602.

Fatehi, F., & Wootton, R. (2012). Telemedicine, telehealth or e-health? A bibliometric analysis of the trends in the use of these terms. *Journal of Telemedicine and Telecare, 18*(8), 460-464.

Freeman, A. (2017). Fathoming the constellations: Ways of working with families in music therapy for people with advanced dementia. *British Journal of Music Therapy, 31*(1), 43-49.

Frost, & Sullivan. (2015). Telehealth to take centre stage in Australia's healthcare system. *Telemedicine Law Weekly*. Retrieved from https://search-proquest-com.ezproxy.uws.edu.au/ docview/1738765345?accountid=361 55

Fuller, A., & McLeod, R. (2016). *Connection, collaboration, and communication: Tele-intervention music therapy services for young children with hearing loss and their families.* Paper presented at the 42nd Australian Music Therapy National Conference, Melbourne, Australia.

Fuller, A., & McLeod, R. (2017). *What's that sound? Tele-intervention music therapy for young children with hearing loss.* Paper presented at the 15th World Congress of Music Therapy, Tsukuba, Japan.

Gfeller, K. (2007). Music therapy and hearing loss: A 30-year retrospective. *Music Therapy Perspectives, 25.*

Gfeller, K., Driscoll, V., Kenworthy, M., & Voorst Van, T. (2011). Music therapy for preschool cochlear implant recipients. *Music Therapy Perspectives, 29*(1), 39-49.

Gillmeister, G., & Robbins Elwafi, P. (2015). Music therapy for children with sensory deficits. In B. Wheeler (Ed.), *Music Therapy Handbook* (pp. 315-327). New York: Guilford Publications.

Havenga, E., Swanepoel, D. W., Le Roux, T., & Schmid, B. (2017). Tele-intervention for children with hearing loss: A comparative pilot study. *Journal of Telemedicine and Telecare, 23*(1), 116-125.

Hoffmann, T., Bennett, S., & Del Mar, C. (2013). *Evidence-Based practice across the health professions* (3rd ed.). Chatswood, NSW: Elsevier Australia.

Hufton, C. (2016). Telehealth: What is it and why is it so important? *The Telegraph.* Retrieved from https://www.telegraph.co.uk/wellbeing/future-health/why-telehealth-is-so-important/

Jack, N., Thompson, G., Hogan, B., Tamplin, J., Eager, R. & Arns, B. (2016). *My profession, my voice: Results of the Australian Music Therapy Association's 2016 workforce census.* Retrieved from https://www.austmta.org.au/resources

Jacobsen, S., & Killén, K. (2014). Clinical application of music therapy assessment within the field of child protection. *Nordic Journal of Music Therapy, 24*(2), 148-166. doi:10.1080/08098131.2014.908943

Jacobsen, S., & Thompson, G. (2017). *Music therapy with families.* London: Jessica Kingsley Publishers.

Jang-Jaccard, J., Nepal, S., Alem, L., & Li, J. (2014). Barriers for delivering telehealth in rural Australia: A review based on Australian trials and studies. *Telemedicine and e-Health, 20*(5), 496-504.

Jennett, P., Hall, L. A., Hailey, D., Ohinmaa, A., Anderson, C., Thomas, R., Scott, R. (2003). The socio-economic impact of telehealth: A systematic review. *Journal of Telemedicine and Telecare, 9*(6), 311-320.

Kaplan, B., & Litewka, S. (2008). Ethical challenges of telemedicine and telehealth. *Camb Q Healthc Ethics, 17*(4), 401-416. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/18724880. doi:10.1017/S0963180108080535

Kitson, A., Harvey, G., & McCormack, B. (1998). Enabling the implementation of evidence based practice: a conceptual framework. *BMJ Quality & Safety, 7*(3), 149-158.

Lifesize Inc. (2018). Lifesize: Video conferencing for the connected workplace. Retrieved from https://www.lifesize.com

Lightstone, A. J., Bailey, S. K., & Voros, P. (2015). Collaborative music therapy via remote video technology to reduce a veteran's symptoms of severe, chronic PTSD. *Arts & Health, 7*(2), 123-136. doi:10.1080/17533015.2015.1019895

Likert, R. (1932). A Technique for the measurement of attitudes. *Archives of Psychology, 140*, 1-55.

Mauco, K. L., Scott, R. E., & Mars, M. (2018). Critical analysis of e-health readiness assessment frameworks: suitability for application in developing countries. *Journal of Telemedicine and Telecare, 24*(2), 110-117.

McCarthy, M., Muñoz, K., & White, K. R. (2010). Teleintervention for infants and young children who are deaf or hard-of-hearing. *Pediatrics, 126* (Supplement 1), S52-S58.

McGilvray, A. (2013). Joining the docs. *The Medical Journal of Australia*. Retrieved from https://www-mja-com-au.ezproxy.uws.edu.au/journal/2013/198/11/joining-docs

Miyahara, M., Butson, R., Cutfield, R., & Clarkson, J. E. (2009). A pilot study of family-focused tele-intervention for children with developmental coordination disorder: Development and lessons learned. *Telemedicine and e-Health, 15*(7), 707-712.

Moffatt, J. J., & Eley, D. S. (2010). The reported benefits of telehealth for rural Australians. *Australian Health Review, 34*(3), 276-281.

Mössler, K., Gold, C., Aßmus, J., Schumacher, K., Calvet, C., Reimer, S., Schmid, W. (2017). The therapeutic relationship as predictor of change in music therapy with young children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 1-15.

National Center for Hearing Assessment and Management. (2018). A practical guide to the use of tele-intervention in providing early intervention services to infants. Retrieved from http://www.infanthearing.org/ti-guide/

Olson, C. A., & Thomas, J. F. (2017). Telehealth: no longer an idea for the future. *Advances in Pediatrics, 64*(1), 347-370.

Radbruch, K. (2001). Music therapy in the rehabilitation of children with cochlear implant (CI). Retrieved from www.musictherapyworld.info

Rolvsjord, R. (2010). *Resource-oriented music therapy in mental health care.* Gilsum, NH: Barcelona Publishers.

Rycroft-Malone, J., Seers, K., Titchen, A., Harvey, G., Kitson, A., & McCormack, B. (2004). What counts as evidence in evidence-based practice? *Journal of Advanced Nursing, 47*(1), 81-90.

Salmon, S. (Ed.) (2008). *Hearing, feeling, playing: Music and movement of hard-of-hearing and deaf children*: Zeitpunkt Musik.

Saunders, B. E. (2015). Expanding evidence-based practice to service planning in child welfare. *Child Maltreatment, 20*(1), 20-22. Retrieved from https://doi.org/10.1177/1077559514566299.

Teggelove, K., Thompson, G., & Tamplin, J. (2018). Supporting positive parenting practices within a community-based music therapy group program: Pilot study findings. *J Community Psychol.* Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/30548603. doi:10.1002/jcop.22148

Turgoose, D., Ashwick, R., & Murphy, D. (2017). Systematic review of lessons learned from delivering tele-therapy to veterans with post-traumatic stress disorder. *Journal of Telemedicine and Telecare.* doi:1357633X17730443

Ward, A. (2016). Music therapy interventions for deaf clients with dual diagnosis. *Voices: A World Forum for Music Therapy, 36*(3).

Willis, J. (2018). VR therapy research transforming perspectives - and improving lives. Retrieved from https://news.aarnet.edu.au/vr-therapy-research-transforming-perspectives-and-improving-lives/

Woottin, R. (1996). Telemedicine: A cautious welcome. *British Medical Journal, 313*(7069), 1375–1377.