Integrating the iPad into Music Therapy Interventions

for Older Adults in Long-Term Care

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# ABSTRACT

Integrating the iPad into Music Therapy Interventions for
Older Adults in Long-Term Care

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The purpose of this research was to re-design traditional music therapy interventions for older adults who reside in long-term care who have impaired physical mobility by integrating the iPad into these interventions. A modified approach to intervention design was used for this study. Literature containing research and theoretical evidence as well as the researcher's practical experience were used to identify risk factors and also to suggest a relationship between the proposed mechanisms of change and therapeutic outcomes. Interventions from two different music experience categories were chosen based on identifying malleable mediators (i.e., aspects of the intervention that could be changed using the iPad to facilitate clients' participation). These two interventions were re-designed using features of the iPad to address the identified barriers. Limitations of the research, potential implications for practice, research, and training are discussed.

my passion for this field and, piece by piece, helped me to come into my own as a music therapist. To my program classmates: sometimes I am in disbelief at how lucky I feel to have met some of the most compassionate, intelligent, funny, creative and talented people in one fell swoop. In the span of two years we have laughed together, we have cried together, and we have laugh-cried together more than is likely natural! In that process you have become best friends for a life-time.

During my advanced practicum, I was fortunate enough to have a music therapy supervisor whom I highly admire. Pierrette-Anne: you encouraged me to think outside the box and to try my idea of using the iPad in music therapy sessions to overcome client's physical barriers. It was this encouragement that lead me to this research in the first place.

To my very patient supervisor, Dr. Laurel Young: thank you so much for being an amazing guide and mentor throughout this entire process. You were my first practicum supervisor at Concordia, and then my research supervisor at the end of this journey – coming full circle with me. Along the way you inspired my passion for working in long-term care, for music therapy research, and have provided me with invaluable opportunities to learn from you. I will undoubtedly take what you have taught me throughout my career.

Thank you to the Centre for Research and Expertise in Social Gerontology for their generous scholarship in support of this research project.

Lastly, I want to thank all of my past, present and future clients. You are the reason I am constantly inspired by music therapy practice and research. It is my hope that this study and many others out there will ultimately help individuals to more easily access music therapy and benefit from best practices.

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**Chapter 1. Introduction**

**Significance and Rationale**

In 2011, approximately 5 million older adults (i.e., 65 years and older) were living in Canada and this number is expected to double by 2036 (Stats Canada, 2014). Aging often elicits a complex array of physical, emotional, social and spiritual needs and as a result, many older adults transition into long-term care facilities (Abbott, 2013; Kane & Kane, 2011; Lynch, 1988; Young, 2013). In 2001, Kane and Kane published a study investigating what older adults' wanted out of long-term care. They found high desire for individuality, interpersonal experiences, control over environment, and the opportunity to make choices. Although these desires may seem simple or basic, barriers often exist in long-term care that impede their full realization. These include, but are not limited, to cognitive decline, illness, and impaired physical mobility (Kane & Kane, 2011). It is my opinion that the various professionals who work in long-term care facilities (including music therapists) must come up with creative solutions to help bypass or eliminate these barriers so that the needs and preferences of older adults living in long-term care can be adequately addressed and the highest quality of life possible maintained.

Music therapists are credentialed professionals who use music experiences and the relationships that develop through them to improve the health and quality of life of their clients (Bruscia, 2014). Music therapists work in long-term care facilities to address a wide variety of needs for older adults including those contained in physical, emotional, social, and cognitive domains of functioning (AMTA, 2016; Bright, 1972; Claire & Memmott, 2008). A diverse set of music therapy methods and interventions have been developed specifically for use with older adults in long-term care (Abbott, 2013; Bright, 1972; Claire & Memmott, 2008; Young, 2013). However, in spite of the careful development of these population-specific methods and interventions, some older adults in long-term care may not be able to fully engage in typical music therapy experiences—even with the assistance of a music therapist. Based on my experience, there are at least two reasons for this. First, due to constraints in budgets and storage space, long-term care facilities may not have a wide range of instruments from which clients can choose. If the most suitable or accessible instrument for a particular client is not available, then that client's options are limited. Second, many clients in long-term care have impaired physical mobility, which in turn may limit their ability to participate in active music-making experiences

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that use traditional musical instruments. I worked with two clients in long-term care who were in this situation. One of these clients had Cerebral Palsy, which severely limited his gross and fine motor functioning from the neck down. His music therapy assessment revealed a need for intrapersonal connection and creative self-expression, both of which could potentially be well addressed by active music-making interventions. Another client, who remained in bed most of the time, lacked the physical strength and energy to play even simple acoustic percussion instruments. It was determined that her social isolation and depressive symptoms could potentially be addressed by active music making interventions. I was motivated by these situations to integrate an iPad into these clients' music therapy sessions, thus making goal-oriented active music making experiences accessible. As a result, these clients were able to achieve their therapeutic goals. The success of these experiences inspired the current research project. These solutions also informed the results of the current inquiry.

Some may be of the opinion that it is not relevant or appropriate for music therapists to use modern technology with the current cohort of older adults who likely have little (if any) exposure to these media. However, my experiences of using the iPad in music therapy sessions with older adults during my pre-professional and advanced music therapy training as well as during my professional clinical experiences to date have been very positive. It seems presumptuous to assume that older adults cannot learn or would not want to be exposed to technologies that might help them. "It is important that older adults are not left behind in the adoption of new technologies" (Peddell, 2013, p.6). It is also important to note that as the baby boomer generation ages, older adults will certainly have more experience with and comfort in using technology, making interventions that incorporate technological media that much more relevant as time goes on.

Finally, some literature has shown potential for the successful use of creative therapeutic interventions that utilize technology (Bache, Derwent, & Magee, 2014; Charness, 2012; Magee, et al. 2011), acknowledging that the iPad may be an "ideal tool" for music therapists to use in their clinical work (Magee, p.31, 2014). Using an iPad may also address issues noted earlier related to budget constraints, limited storage space, and accessibility to a wider range of clinically indicated instruments through various apps. However, there is limited information on exactly how technology might be integrated into music therapy interventions, leaving clinicians to their own devices to figure this out. In a systematic literature review on the use of technology

in music therapy, Crowe and Rio (2004) recommended that more "specific technology-based interventions pertinent to a particular population [need to be developed]" (p.306). The current paper hopes to address this identified need, within the context of older adults with impaired physical mobility who are living in long-term care.

**Statement of Purpose**

As noted above, many older adults who live in long-term care have impaired physical mobility that impede their ability to participate in and thus benefit from traditional music therapy interventions. Based on the literature and my personal experience, it seems that there is much potential for technological innovations, such as the iPad, to make music therapy interventions more accessible. However, no literature exists to help guide music therapists on how they might effectively use the iPad in sessions with this population. Therefore, the purpose of this study was to re-design traditional music therapy interventions for older adults residing in long-term care who have impaired physical mobility by integrating the iPad into these interventions.

**Research Questions**

The primary research question was: How might the iPad be integrated into traditional music therapy interventions in order to make participation more accessible for older adults in long-term care who have impaired physical mobility? Subsidiary research questions were: (a) How might the iPad be integrated into a re-creative music therapy intervention? and, (b) How might the iPad be integrated into an improvisatory music therapy intervention?

**Key Terms**

There are several terms that must be defined within the context of the present study. The *iPad* is a compact handheld computer made by Apple with many downloadable applications/apps in which finger taps and swipes are used rather than a keyboard (Knight & Lagasse, 2012).

*Traditional music therapy interventions* are those that have been identified in the literature as being used with older persons in music therapy contexts (Abbott, 2013; Young, 2013). These interventions typically do not incorporate modern technology.

Bruscia (2014) has identified four categories of music therapy experiences/interventions: re-creative, improvisatory, compositional and receptive. For reasons that will be presented in Chapter Three, this study has been delimited to including only one re-creative and one improvisatory intervention. A *re-creative music therapy experience* is defined as one wherein the client learns, performs and/or reproduces precomposed music (Bruscia, 2014). An *improvisatory*

*music therapy experience* is defined as one wherein the client makes up music while playing or singing, extemporaneously creating a melody, rhythm, song, or instrumental piece (Bruscia, 2014). Within the context of both of these experiences, it is assumed that they are being facilitated by a credentialed music therapist.

Within the context of the present study, *older adults* are being defined as persons over the age of 65 who in this case, reside in a long-term care facility. *Long-term care* is defined as a full time residence that provides care for the medical needs of older adults who are admitted for various reasons including lack of autonomy and decline in cognitive and/or physical functioning (Canada Employment and Social Development Canada, 2015). Finally, *impaired physical mobility* is defined as limitation in independent, purposeful physical movement of the body or of one or more extremities (Medical Dictionary, 2015).

**Chapter Outline**

This thesis has been organized into five chapters. Chapter One describes the significance, rationale, and purpose of the inquiry. Research questions and key terms are also presented. Chapter Two reviews relevant literature in the areas of: (a) older adults with impaired mobility and use of technology; (b) music therapy with older adults in long-term care; (c) barriers to participation in music therapy interventions; and (d) technology in music therapy. Chapter Three describes how a modified intervention research methodology was conceptualized in this research. Chapter Four includes the results (i.e., the interventions that were designed). Chapter Five identifies limitations of the research, as well as implications for clinical practice and training. Suggestions for future research are also presented.

## Chapter 2. Literature Review

As noted in Chapter One, a need for more population specific music therapy interventions that integrate technology has been identified. The present study attempts to address this need by incorporating the iPad into traditional music therapy interventions that would be utilized to address the needs of older adults in long-term care who have limited physical mobility. The purpose of this literature review is to summarize information related to the topic of the present study in order to help readers further contextualize the rationale for this research. Areas of information include: (a) older adults with impaired mobility and use of technology; (b) music therapy with adults in long-term care; (c) barriers to participation in music therapy intervention, and (d) technology in music therapy.

### Older Adults with Impaired Mobility and Use of Technology

Some of the most prominent age-related declines in physical functioning include changes in balance and gait, lack of muscle strength in gross and fine-motor functioning, and decreased speed in movement (Seidler, et al., 2009; Bodner & Bello-Haas, 2009). This process of physical impairment in normal aging is due to joint inflammation and disease from the decline of the central, peripheral and neuromuscular systems (Bodner & Bello-Haas, 2009; Seidler, 2009).

In addition to the natural decline in physical functioning due to the aging process, there is also considerable decline due to the prevalence of illness and disease in older adults. These include but are not limited to: stroke, Parkinson's disease, arthritis osteoporosis, physical disability, multiple sclerosis, or a combination thereof. (Bodner & Bello-Haas, 2009; Erber, 2010). Osteoarthritis (OA) is an example of a common condition in older adults that affects joints such as knees, spine, hips, hands, and fingers. OA can lead to a lack of functional mobility and can sometimes lead to a complete loss of physical independence (Bonder & Bello-Haas, 2009; Erber, 2010).

With these changes in physical functioning, older adults also often experience emotional challenges as a change in self-perception emerges due to the lack of autonomy that is accompanied by the impairment (Erber, 2010). This change can further decline their overall quality of life and participation in activities. Webber, Porter & Menec (2010) wrote, "Mobility is fundamental to active aging and is intimately linked to health status and quality of life" (p.1). Due to the prevalence of impaired mobility amongst older adults and other populations, there has been an increase in integrating technology in many fields of study (Lancioni & Nirbhay, 2014).

An entire area of study and design called 'assistive technology' has emerged in order to address these problems. Assistive technology is defined as any device or product that aids the functional independence of a person with disabilities and older adults, helping them to overcome infrastructure barriers and improving their quality of life (Lancioni & Singh, 2014; Hersch & Johnson, 2008). Assistive technologies are often designed to address physical mobility issues that accompany specific conditions. For example, scooters and Ankle-foot orthoses are designed to improve gait and ambulatory functioning of individuals with multiple sclerosis (MS; Souza, et al., 2010).

Due to an aging demographic, there is a subsector of assistive technology that is specifically designed to accompany the physical and cognitive challenges of the geriatric population (Pollack, 2005). These assistive technologies fall under three main categories: assurance systems, compensation systems, and assessment systems. Assurance systems can recognize if the older adult has eaten, taken medication, or has fallen and sends an alert to a health care professional who can come to their aid. Compensation systems are meant to compensate in daily activities and functions for those with physical impairment. Assessment systems are meant for those with cognitive decline and provide ongoing assessment of cognitive functioning and impairment (Pollack, 2005).

An interactive example of a compensation system of assistive technology for older adults is called 'Serious Games`. Serious Games involves the adaptation and creation of videogames for the purpose of improvement of physical health and well-being (Garcia-Marin, Navarro, & Lawrence, 2011). Serious Games for the elderly focus specifically on improving balance, upper and lower-limb rehabilitation, independence and cognitive awareness (Garcia-Marin, Navarro, & Lawrence, 2011). Given that the use of technology to address the needs of older adults appears to be a successful and evolving endeavor, an increased integration of technology into music therapy interventions for these individuals seems relevant and timely.

**Music Therapy with Older Adults in Long-Term Care**

Expressing emotions, connecting with others, and stimulating cognitive functioning are just some of the benefits older adults can experience from effective music therapy practices (Abbott, 2013; Bright, 1972; Young, 2013). These benefits are outcomes of credentialed music therapists conducting descriptive assessments and developing individualized treatment plans to identify areas of need that can be best addressed by music therapy interventions (Norman, 2012).

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Areas of needs can be divided into domains of functioning such as communication, cognitive, motor, social, emotional and spiritual. They can also be conceptualized for geriatric care in focusing on the mind, body, spirit, and the community (Bright, 1972). Within these domains of functioning, typical goals for older adults may include: increasing socialization, facilitating physical exercise, managing stress and pain, managing challenging behaviours, supporting spiritual practices, increasing feelings of empowerment, and increasing self-expression (Abbott, 2013; Clair & Memmott, 2008; Lynch, 1988; Young, 2013).

The context within which a music therapist works with older adults can affect the type of work that he/she does and the goals that can be addressed. A music therapist's scope of practice with older adults in a long-term care setting is different than that of a music therapist who works in a retirement facility or an adult day program, for example. Persons living in long-term care are admitted to these facilities due to their higher level needs and subsequent lessening of autonomy. Furthermore, music therapists who are hired on a contract basis for a few hours per week generally work independently, have limited access to clients' charts, and often are only able to address the "here and now" needs of their clients. Music therapists who hold more permanent part time or full time positions may have greater opportunities to access clients' charts, attend multidisciplinary team meetings, observe clients' day to day functioning, and integrate music therapy goals into individual resident's interprofessional care plans (Young, 2013). The role of the music therapist in these contexts is something that has evolved over time, as the music therapy profession has gained more recognition and research backing.

The use of music therapy in long-term care and other contexts has a long history in cultures around the globe (Abbott, 2013; Bright, 1972; Clair & Memmott, 2008; Ridder & Wheeler, 2015; Young, 2013). It was during World War I that music therapy gained some recognition as a bona fide profession when it was being used as an intervention with rehabilitating soldiers (Bright, 1972; Claire & Memmott, 2008). The first music therapy training program was founded in North America in 1944 (AMTA, 2016). Although music therapy has been used with older adults for many years, there seems to be a recent increase in awareness of its potential therapeutic effects. In addition to being highlighted by popular media, cognitive neuroscientists are providing scientific evidence to support what music therapists have been reporting anecdotally for years—that the music functions of the brain seem to remain intact or deteriorate less slowly than other functions of the brain thus allowing persons with dementia,

stroke, etc. to successfully utilize music as a therapeutic medium (Peretz & Coltheart, 2003; York, 1994; Young, 2013). Furthermore, individuals' capacity to enjoy and benefit from music experiences is generally not affected by physical decline/aging as are many other activities, thus highlighting its increased potential for use as both a recreational and therapeutic medium (Abbott, 2014; Cohen, Bailey, & Nilsson, 2002; Fung, 2010). Although an individual's capacity to enjoy music is not generally affected by physical decline, the level at which the individual can actively participate in music therapy experiences may be affected and become a barrier to benefiting from these interventions.

**Barriers to Participation in Music Therapy Interventions**

Music therapy interventions often entail physical involvement (i.e, gross and/or fine motor skills) to achieve goals that are not necessarily targeting physical outcomes (e.g., social and emotional goals). This is especially the case when it comes to re-creative and improvisational interventions as they generally include the use of instrument playing or movement of some kind. Some examples of re-creative interventions include: therapeutic music lessons/playing a familiar (known) instrument, playing percussion instruments (within individual or group contexts), tone chime choir, individual/group singing, and community music therapy performance. Typical goals addressed by these interventions are social integration, cognitive skills maintenance, and enhancement of sense of self and/or community. Improvisatory interventions used with older adults in long-term care include: vocal improvisation (various individual or group formats), instrumental improvisation (various individual or group formats). Typical goal areas addressed by these interventions are: working through emotions, building sense of integrity, increasing self-awareness (in group and individual contexts) and enhancing self-expression (Abbott, 2013; Bright, 1972; Bruscia, 2014; Young, 2013). These interventions can include the use of gross and fine motor movement and the need for physical strength. Examples of instruments that may be used in both re-creative and improvisatory experiences are drums (various kinds, with and without mallets), a wide variety of percussion instruments (cymbals, shakers, claves, etc.), tone chimes, piano, wind instruments, stringed instruments—all of which require some kind of physical movement/ability. This may be difficult for a large number of older adults who experience a decline in physical functioning with age and are therefore less likely to be able to perform functional activities (Bonder & Bello-Haas, 2009; Erber, 2010; Pollack, 2005; Seidler, et al., 2009 ; Smith, 1999 ; Webber, Porter & Menec, 2010).

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"Traditional acoustic musical instruments are customarily used [in music therapy], but have limitations when client's movement is restricted" (Hunt, Kirk, & Neighbour, 2004). Sometimes the physical impairment may make it so that the individuals are unable to manipulate acoustic instruments. Other times, the individual may be able to manipulate the instrument, but not produce the sound quality as intended due to factors such as strength, control, and ability to keep a steady pulse. These factors could likely take away from the aesthetic experience, as well as the therapeutic intention and value (Magee, 2014).

**Technology in Music Therapy**

**Music therapists' perspectives on technology.** Despite research and case studies indicating the benefits of technology, music therapists have varying perspectives on the use of technology in practice and whether it is appropriate to use in sessions. In a 2012 study that surveyed 600 American music therapists, it was found that 71% of respondents reported using technology in their practice. However, generational differences with regard to opinions on the relevance of technology to music therapy practice emerged (Hadley, Hahna, Miller, & Bonaventura, 2014). Significantly more music therapist respondents aged 51-60 agreed with the following statement "Music technology is not appropriate/relevant to music therapy work in general" than respondents aged 21-30 years old ($p = .03$; Hadley et al., 2014, p.2).

Generational differences were also found in another survey conducted in the United States that looked at technology trends and opinions amongst both board credentialed music therapists and music therapy student interns (Cevasco & Hong, 2011). Several board certified music therapists (n = 223) and music therapy student interns (n =110) responded to the survey. Results indicated differences between board-certified music therapists and music therapy student interns in the area of overall use of technology in their clinical work. While interns had more access to technology, practicing music therapists used it more frequently. The highest rated technological software used amongst both interns and clinicians was Apple's Garageband which can be found on the iPad.

Both surveys indicated that some respondents who found technology to be irrelevant seemed to have this opinion because they found it to be intrusive and/or costly (Hadley, Hahna, Miller, & Bonaventura, 2014; Streeter, 2001). However, other respondents expressed that they did not use technology due to their lack of technological expertise especially when compared to their expertise in using live acoustic music. Some individuals felt that they were simply unaware

of how technology could be used or which type of technology to use (Cevasco & Hong, 2011; Hadley, Hahna, Miller, & Bonaventura, 2014). Both surveys concluded that a large number of music therapists would believe they would benefit from further education on proper use of technology in practice.

   **Past and current trends.** Technology is undeniably an integral part of modern day culture, making it crucial for music therapists to learn and understand from both practical and cultural perspectives in order to be culturally competent practitioners (Knight & Lagasee, 2012). In Bruscia's (1986) advanced competency list, he noted that music therapists should have the "ability to apply modern technology (computers) to musical aspects of clinical practice." Furthermore, the Canadian Association for Music Therapy (2014) declared in Article 3.4 of their professional competency list that music therapists must "Demonstrate knowledge of technology, media and instruments used in the practice of music therapy" (p.2). Similarly, Article 13.14 of the American Music Therapy Association's professional competency list (2014) indicated that music therapists must "Maintain a working knowledge of new technologies and implement as needed to support client progress towards treatment goals and objectives" (p.3).

   Although music therapy associations, authors, and practitioners are recognizing the role that technology plays in current clinical practice, the use of technology in music therapy began in the early 1980's with the advent of Musical Instrument Digital Interface (MIDI) technology (Ramsey, 2014). MIDI is an interface that when connected to a computer can capture and analyze music (Knight & Lagasse, 2012; Ramsey, 2014). By the 1990's, journal articles and conference presentations began to focus more on technology. This included a section in the journal *Music Therapy Perspectives* entitled `Integrating Technology` (Knight & Lagasse, 2012; Ramsey, 2014).

   A popular technological item that appeared in 1992 and is still being used today is the Soundbeam©. Physical gestures that come in contact with the infrared light produce sound or sound sequences. This has often been used with clients with impaired mobility who can make slight purposeful movements such as eye blinking to trigger the sound (Knight 2013; Magee, 2014) By the early 2000's music therapists began to recognize the significant role technology was playing, as due to the increase in digital technology in general (Hahna, Hadley, Hahna, Miller & Bonaventura, 2014).

Current trends in technology use in the field of music therapy can be found in the book edited by Wendy Magee entitled `Music Technology in Therapeutic Health Settings." Among music therapists, ``the more frequently used technology includes recording technologies, amplification equipment, electronic MIDI instruments, electronic hardware and software, software with specialist input devices and vibroacoustic therapy equipment (Hadley, Hahna, Miller, & Bonaventura, 2014, p. 36). Music therapists often use Assistive Alternative Communication switches, which are devices that require activation, whether by physical contact, movement, air flow, or sound (Bache, Derwent, Magee, 2014; Magee, 2011; Knight, 2012). An example of a switch typically used in music therapy for those with limited communication via speech is called voice output communication aids—VOCA (Magee et. al, 2011). Zigo (2014), indicated that music therapists use VOCA to help their clients ``increase independent participation in music making" (p.153). For individuals who would generally require hand-over-hand assistance for acoustic instruments, the VOCA is often a good replacement tool enabling them to voluntarily play the technology" (Zigo, 2014).

A case vignette entitled 'Recording Software with an Elderly Woman Receiving Radiotherapy' is one example of technology being used with older adults in music therapy (Magee et al., 2013). This client was referred to music therapy due to anxiety experienced when undergoing radiotherapy. During a brief 15-minute session, the music therapist was able to make a recording of the client and her daughter singing a song they shared and provide them with a copy of this recording. The short description of this session mentions that although the client was unfamiliar with this technology, it appeared to provide her with a sense of empowerment (Magee et al., 2013). Incorporating technology into sessions with older adults may provide a means for them to connect with family members of younger generations (Weissberger, 2014).

It is also important to note that the emerging focus on technology is present in scholarly conferences such as the one held in in November 2014, hosted by the British Association of Music Therapy entitled, 'Music Therapy and Technology: Enabling the Art and the Science.' There is also emerging acknowledgment in the continuing education company, Music Therapy Ed, with workshops on the subject of technology including those entitled, 'iPad apps that support MT' and 'Augmentative and Alternative Communication Devices.' The iPad comes equipped with many music applications that make it ideal for use in music therapy settings (Knight & Lagassee, 2012; Krout, 2014) and this information is particularly relevant for the present study.

**iPads and music therapy**. Pedell, (2000) stated the following:

Studies demonstrate how touch screen tablets, such as the iPad, can be effective in care facility and home environments for older people. Touch screen technology has been used to support reminiscence, aid recall, increase interpersonal interactions, promote intergenerational relationships, improve staff and resident relationships and improve quality of life (p.10).

Tablets are compact, handheld computers with many downloadable applications/apps in which finger taps and swipes are used rather than a keyboard (Knight & Lagasse, 2012). Knight and Lagasse (2012) define applications as "software that is nearly always downloadable, whether free or paid, and then dwell on the computing device they are designed for" (p.2). Various companies make tablets, one of them being Apple which produces the tablet called the iPad. For the purpose of this study, the iPad will be utilized exclusively rather than tablets produced by other companies as there are several unique features that make it particularly useful in music therapy contexts. First, the iPad is highly intuitive. This means that it is designed to be used instinctively, making it easier to learn and use.  Furthermore, the iPad only requires a very light touch to elicit the desired response and there is an undetectable amount of time between touching the screen and hearing the desired sound, similar to the experience of playing a traditional instrument. It has been noted that this quality makes it particularly useful for older adults with restricted mobility, thus providing opportunities for them to engage in experiences they may not otherwise have access to (Leng, Yeo, George and Barr, 2013; Krout, 2014; Phiriyapokanon, 2011). The iPad comes equipped with a microphone and high definition visual quality, and by attaching speakers, high audio quality can easily be achieved (Krout, 2014). It also comes equipped with many applications (also called "apps" which are free or paid software that can be downloaded to iPads) and there are many other apps that can be downloaded for a small fee (i.e., music apps, documentation apps, etc.; Knight, 2012; Krout, 2014).

One of the free apps that comes with the iPad is GarageBand, which is an application that enables music creation via audio recordings, virtual software instruments and MIDI editing (Knight, 2012; Magee, 2011). As previously mentioned, in a study conducted by Cevasco and Hong (2011), it was found that GarageBand is the most-used application by music therapists thus implying that the iPad is the preferred tablet for many music therapists.

Music therapy case studies with children and adolescents have used the GarageBand application and highlighted the potential for the application to be used in interventions targeting creativity and self-expression goals (Magee et al., 2011; Magee, 2013). Although these case studies do not focus on older adults, they can provide insight on when, why, and how the application and the iPad is used in sessions. For example, one case study highlighted the use of the GarageBand application with a 15-year-old visually impaired adolescent. The intuitive as well as stylistic options of this application allowed him to participate musically in a way he had not been able to in previous sessions. This opened the door for peer collaboration, self-expression, and renewed self-esteem (Magee et al., 2011).

Other apps can be found by searching the app store and typing in keywords or categories to identify the type of app you are looking for (Krout, 2014). Knight (2013) separates apps into four categories based on the needs of music therapists and their clients. The first category is apps for instruments, which includes an app called AUMI (Adaptive Use of Musical Instruments). AUMI uses video of the client`s face to track movement for musical interaction. Other apps in this category include Air Harp, Pianist Pro, Beatbox Pad, Guitar!, and Percussive. The second category is apps for playback /manipulation /songwriting /cataloguing. These applications can provide an extension of this database, giving the music therapist access to extensive resources that can be used in various interventions. These include apps such as iTunes, MusicNotes, GarageBand, and OnSong. The third category of apps for music therapists is for recording audio. These include GarageBand, Songfit, and iRig recorder. The fourth category is apps for documentation, which include Behaviour Tracker Pro, and ABC data pro (Key Changes Conference, 2014; Knight, 2013; Knight & Lagasee, 2012). Krout (2014) suggested another category be included for Non-Music-Focused apps. These apps can be used with a multitude of clientele, from children to older adults with a variety of needs. However, the iPad is often used for children with special needs, learning difficulties and impaired physical mobility in fields outside of music therapy including special education. In an interview, the creator of the Apple iPad Steve Jobs was asked about this growing realization among researchers and responded by stating: "We take no credit for this, and that's not our intention...our intention is to say something is going on here. Researchers should take a look at this" (cited in Valentino-Devries, 2010).

Although examples of the use of the iPad with older adults are scarce in music therapy literature, there have been several studies on its potential for use in related disciplines. One

example is a study titled "Comparison of iPad applications with traditional activities using person-centered care approach: Impact on well-being for persons with dementia." This study concluded that the use of the iPad was just as successful as the more traditional activities, such as cooking and arts and crafts, at promoting well-being in a group of older adults with dementia (Leng, Yeo, George & Barr, 2013). A study in the field of computer engineering found that the use of iPad game applications such as 'Memory and Reveal' with older adults could help facilitate activities that were empowering and provided opportunities for reminiscence and social interaction (Pedell, Beh, Mozuna, & Duong, 2013).

Art therapy literature suggests that iPads and other tablets have potential benefits when the pros and cons are weighed from client to client, based on factors such as their accessibility and personal communication style (Choe, 2014; Mihailidis et. al., 2010). Additionally, authors recommended that art apps used in art therapy should be chosen in part based on the variety of options they give the clients, including colours, shapes, etc. (Mihailidis et. al., 2010). Due to the variety of applications that are available for download, there is generally a wide variety for therapists to choose from based on client need, ability, and app qualities (Choe, 2014; Knight, 2013; Krout, 2014).

**Competent use.** When choosing which applications to use on the iPad, researchers suggest keeping in mind what the app was marketed and meant to do, asking ourselves if we have enough experience with the app, if the app is in alignment with the client`s expectations and if there is external evidence to support its use (Knight, 2013; Krout 2014). In a study on incorporating the iPad in occupational therapy in an intensive care unit, some guidelines were outlined for determining use (Regensburg, 2014). This included screening for alertness, ability to make contact with the iPad, and ability to follow simple commands (Resensberg, 2014). When it comes to any technological device used in music therapy it is important to get to know the device in order to use it competently and avoid technical difficulties that may take away from the client's therapeutic experience and make sure that it is indicated and appropriate for the client (Magee, 2014; Weissberger, 2014). Using technology in music therapy should always remain goal centered and client centered, without integrating it only for the purpose of staying culturally current (Nadler, 2011; Magee, 2011; Magee, 2014; Knight & Lagasee, 2012). It was well said by Knight & Lagasse (2012), "The intention will remain the same: to use music to help people reach their goals" (p.8). By keeping this in mind, music therapists can practice integrating technology

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when it is clinically indicated and goal-centered to enhance the quality of care for the client's with whom they work.

There are some important factors to keep in mind when choosing to use technology with individuals with impaired physical mobility in a music therapy context. Magee (2014) noted that one of these is establishing a point of rest. The point of rest is described as a position in which the client is able to physically choose to play or not to play the technology. It is highly recommended that music therapists collaborate with other professionals when integrating technology for those with physical impairments into the session to help establish the point of rest and other physical positioning. Physical therapists, occupational therapists, and assistive technology specialists may be consulted (Magee et. al, 2011; Magee, 2014). Contraindications for technology use with individuals who have impaired physical mobility are also vital to practicing in a safe and therapeutic manner. For example, music therapists must assess whether the movement needed to access the technology fatigues the client with physical impairment. Fatigue may be due to physical strength or repetition needed to play the device. Sometimes this can be adjusted using the technology or it may mean that the technology is contraindicated for the client (Magee, 2014).

**Summary.** Overall, the literature indicates that technology, assistive technology, and the iPad specifically, can be particularly useful for individuals with impaired physical mobility. Older adults in long-term care often experience impaired physical mobility but the multiple benefits that they could receive from actively participating in "traditional" music therapy interventions may be inhibited by these impairments. Further research on how to integrate the iPad into these interventions is therefore warranted.

## Chapter 3. Methodology

**Design**

A modified approach to intervention design was used for this study (Fraser and Galinsky, 2010). Literature containing research and theoretical evidence as well as the researcher's practical experience were used to identify physical limitations that inhibit older clients' ability to participate in music therapy interventions (i.e., risk factors) and to suggest a relationship between the proposed mechanisms of change (i.e., how the iPad was integrated into these interventions) and therapeutic outcomes. See data collection and analysis procedures outlined below.

**Ethical Considerations**

Given that no participants were used in this study, ethical issues were minimal. The researcher did draw upon her personal experiences of using the iPad in her clinical work but this was done retrospectively. No sensitive or identifying information is contained in this study. Clients' clinical processes were not altered or affected in any way as they were not part of this study. This research was conducted after the researcher had finished her work in the long-term care contexts where she had these clinical experiences.

**Participants**

This study had no participants.

**Data Collection Procedures**

In order to adhere to the scope of a Master's thesis and to clearly define the parameters of this study, several delimitations were imposed. Sources of data were delimited to scholarly literature and the researcher's personal clinical experiences of using the iPad in music therapy sessions. Other music therapists' and clients' perspectives were not included. Although aspects of the resultsmay be applied to other client groups who live in long-term care (e.g., persons with dementia), this research focused specifically on creating accessible interventions for older adults who cannot participate in traditional music therapy interventions because of physical limitations. The results were delimited to creating one intervention for two of the four categories of music experiences as defined by Bruscia (2014): re-creative and improvisatory. These two categories of music experiences were chosen because they consistently involve the clients' participation in active music making experiences for the purpose of achieving social and/or emotional goals. These two interventions do not comprise a single protocol but are meant to be used as individual interventions in and of themselves. Finally, the revised interventions featured two specific apps

(based on the researcher's previous experience in using these apps) although there are many others that could have been used.

Relevant literature was identified using keyword searches in databases such as PsychInfo, Google Scholar, and MEDIcare. Keywords included: music therapy, iPad, technology, creative arts therapies, older adults, long-term care, geriatrics, adaptive technology. Additional analytic memos were made throughout the research process as the researcher reviewed the literature in order to help identify links between theory and practice.

**Data Analysis Procedures**

The researcher examined the literature to identify the problem (i.e., how clients' physical limitations inhibited their participation in music therapy experiences that could otherwise address their needs) and develop theoretical and practical ideas around how the problem might be addressed. She also used her own clinical experiences and analytic memos to inform this process. Two traditional (commonly-used) music therapy interventions with older adults in long-term care were identified. One intervention from each two music experience categories as outlined by Bruscia (2014) was chosen (i.e., one re-creative and one improvisatory intervention) based on identifying malleable mediators (i.e., aspects of the intervention that could be changed using the iPad to facilitate clients' participation). The two interventions were re-designed using features of the iPad to address the identified barriers. The proposed interventions were not implemented or evaluated in a "real world" setting.

## Chapter 4. Results

The following interventions are presented with the assumption that the music therapist has determined (through an assessment process) that the goal areas typically addressed by these interventions are indicated for the client. It is also assumed that the client has provided consent and/or expressed interest in participating in music therapy. However, impaired physical mobility precludes the client's participation, thus limiting his/her ability to benefit from the indicated intervention(s).

Based on the literature and my experience, some typical physical mobility impairments (i.e., risk factors) have been identified. Solutions (i.e., mechanisms of change) are proposed that integrate key features and applications of the iPad while keeping the therapeutic intent of the original intervention intact. A four-step approach was created which involved: screening, selecting, adjusting, and integrating.

### Re-creative Intervention: Community Music Therapy Group Performance

**Brief description.** The music therapist facilitates opportunities for clients to "experience the joy of performing music with and for others in a supportive and accepting environment" (Young, p. 40, 2013). Performances can occur in various forms including singing in a choir, a drumming group, a tone chime choir, an improvisation group, and/or any combination thereof. Goals include: rekindle previously-enjoyed musical practices, increase feelings of self-worth or validation through the capacity to contribute, increase or maintains one's sense of identity, experience a sense of belonging (to a group or community), experience feelings of accomplishment, create a sense of community, change the community environment, and improve relationships with others by highlighting the client's potentials (Abbott, 2013; Powell, 2004; Young, 2013).

**Givens and fundamental procedures.** It is assumed that the following conditions are in place when this intervention is used:

- Initial and ongoing assessment by the music therapist determines that performance is indicated for this client to address one or more of the above goals and that no contraindications for performance have been identified.
- The client wants to participate in a music performance.
- The music therapist has secured a safe and appropriate performance environment. The fundamental procedures are as follows:

- Client participates in music experiences (i.e., rehearsals) structured and supported by the music therapist as necessary to prepare for performance.

- Client is provided with a structured opportunity within which to execute the performance.

- Therapist provides musical or logistical support to client as needed during the performance to ensure that the performance is a successful and/or positive experience for the client.

**Modifying the intervention.**

*Step 1: Screening.* After determining that a community music therapy performance is indicated for the client and that barriers may inhibit his/her participation, specific barriers (i.e., risk factors) and protective factors must be identified. Based on the literature and my clinical experience, I created a screening tool for integrating the iPad into interventions for older adults with impaired mobility (see Tables 1 and 2 below). By implementing this tool music therapists can create a simple protocol using percussion instruments to determine the risk and protective factors (i.e., physical limitations and resources) for the particular client. The music therapist is also be able to determine potential contraindications for integrating the iPad. For the purpose of demonstration, I will describe a fictitious client named "Simon" and a selection process where the iPad is used to facilitate drum playing for an individual with limited mobility who is participating in a group drumming performance.

The results of Simon's screening indicates that his risk factors are a lack of fine motor skills and overall lack of physical strength. A protective factor is the full range of gross motor functioning in his right arm. Based on this information the music therapist can conclude that barriers exist for participation in the traditional intervention (as outlined above) and that the integration of the iPad is indicated.

Table 1

*Music Therapy Screening Tool for Integrating the iPad: Physical Challenges and Resources*

| *Physical Challenges and Resources* | | | | | |
|---|---|---|---|---|---|
| Gross Motor Skills | Range of Motion | Fine Motor Skills | Range of Motion | Physical Strength | Check |
| Right Arm | | Hand Grasp | | Inhibits resident to use enough force to create sound on acoustic instrument. | |
| Left Arm | | Finger Movements | | | |
| Right Leg | | | | Inhibit resident from producing aesthetically pleasing sound on acoustic instruments. | |
| Left Leg | | | | | |
| Trunk | | | | Inhibits resident from holding an instrument. | |

Table 2

*Music Therapy Screening Tool: Contraindications*

| *Physical, Cognitive/Emotional, and Sensory Contraindications* | | | | | |
|---|---|---|---|---|---|
| Physical | Check | Cognitive/Emotional | Check | Sensory | Check |
| Inconsistent or involuntary movements. | | Excessive frustration or confusion caused by technology or new concepts. | | Visual Impairment | |
| | | | | Auditory Impairment | |
| Will use of iPad be too physically exhausting and cause fatigue? | | Lack of awareness of cause and effect. | | Pain | |
| | | | | Hypersensitivity to tactile stimuli. | |
| | | Hesitant to use adaptive devices due to difficulties coping with changes in physical functioning. | | | |
| | | Dislike of the quality of sound produced by iPad apps. | | | |

| Is this client a good candidate for integrating the iPad into music therapy interventions: Yes:___No:___ Rationale:_____ |
|---|

***Step 2: Selecting.*** Once barriers and strengths have been determined (assuming that there are no contraindications that cannot be addressed), the music therapist carefully selects a suitable iPad application. The selection is based on three key factors: Simon`s physical limitations/barriers, physical abilities/resources, and the capacity of the iPad application to fulfill the essential components of the original music experience—in other words, the components of the experience that make it therapeutically effective.

The intervention calls for all of the group members to play the drums. This limits the iPad applications to those that have a drum interface which produces a similar sound quality to the drums being used by the rest of the group members. The results of Simon`s screening indicate that it is important to choose a drum application which has a large visual, allowing for the entire hand to fall on the iPad and produce the sound without the need for him to make any small or precise finger movements due to the impairment in fine motor functioning. Based on all of this information and my clinical experience, the 'Djembe!' application (free version) has been selected.

To download the application, the music therapist first ensures that he/she is connected to the internet. This is done by clicking on 'Settings', 'Wifi' and then switching the on tab so that a green light appears. Next, the music therapist clicks on the 'Play Store' application built into their iPad, types in 'Djembe!', and then taps 'Download.' Once downloaded, Djembe! appears on the main screen of the iPad.

Upon opening the application the music therapist will notice a small 'i' on the bottom right corner of the screen. Here he/she will find key features of the application; settings, layout, metronome/beats, recorder, and music library. The applicable features for this intervention are those of the settings and layout.  The settings feature allows for the music therapist to adjust drum volume, master volume, pitch, rolls, and animation. The layout features allows the music therapist to choose between seven different drums. This drum can be selected based on sound matching the traditional drums used by the rest of the group, or by having the client choose the one he/she enjoys most. These settings can potentially be chosen by the client, if working towards relevant goals that are conducive to choice making.

Based on the identified risk and protective factors, the music therapist determines how the client can most optimally play the application. Based on Simon`s example, it was determined that he can use his right arm and hand to play, using a typical drumming motion. Next, the music

therapist determines if any additional materials are needed to execute the experience (refer to the Appendix for a list of additional materials that may be of benefit). Music therapists may also need to explore the kinds of products that Apple has for this purpose. In this scenario, an iPad stand and a small portable Bluetooth speaker would be very helpful. The iPad stand should be adjusted so that the screen is facing flat upwards, to mimic the position of a traditional acoustic drum. The Bluetooth speaker should be set up near the iPad so that the sound appears to be coming directly from the iPad itself.

*Step 3: Adjusting.* The music therapist is prepared to describe what the iPad is and demonstrate it for Simon in a private setting outside of the music therapy group context. The music therapist can then allow the client to try the application and asks them for feedback (e.g., what does he think of the sound quality). As long as he is open to the using the iPad and no further contraindications emerge, the music therapist can then consult with other professionals at the long-term care facility (if applicable and possible). Occupational therapists and physiotherapists may help the music therapist to make sure that Simon will not become overly fatigued by the use of his right arm, and help to determine the point of rest (POR). As noted in Chapter Two, point of rest (POR) is the position in which the client is able to physically choose to play or not to play the technology. In this case, Simon's POR would be on his right side, at a height and distance where he can comfortably play and stop playing the drum.

*Step 4: Integrating.* The music therapist prepares to have Simon be the first one to arrive at the sessions/performances. This ensures that they can take the extra time needed to set up the iPad and additional materials. Taking the time to do this with the other group members present may make Simon uncomfortable and anxious. Next, the music therapist turns off the wifi connection on his/her iPad in order to avoid advertisements popping up and disrupting the client's playing. The music therapist may also consider closing any other applications that are open on the iPad, as accidentally swiping the screen may cause the applications to open. Once the iPad, iPad stand, and Bluetooth speaker set up according to the POR, the music therapist can then test the sound by asking the Simon to play. Adjustments to the sound can be made both on the iPad application (Settings – Drum Volume) and directly on the blue tooth speakers. Throughout practice sessions, the music therapist should be aware of seating, placing members who need cueing closer to the front. If Simon is observed to be experiencing difficulty playing, the music therapist may need to make an adjustment to his POR and/or check for fatigue. It is

also important for the music therapist to be constantly aware of the sound quality produced by the application and the speakers, making sure that it "fits" with the rest of the group (i.e., from a musical and aesthetic perspective). Most importantly, the drum should sound as close to a real drum as possible. During practice sessions, the music therapist can provide opportunities for choice making so that the client can choose the drum/sound that resonates the most with him. Simon can make this selection based on the seven drums available within the application. At the end of the session/performance, the music therapist is prepared to ask Simon how he felt about the experience and the use of the iPad. Making sure to answer his questions and teaching him about the iPad technology may contribute to goals related to this community performance intervention such as increasing feelings of self-worth and experiencing feelings of accomplishment.

**Improvisational Intervention: Individual Instrumental Improvisation**

**Brief description.** Individual instrumental improvisation involves the music therapist and client improvising together on various instruments (Abbott, 2013). This can be done within a variety of models and therapeutic approaches including the Nordoff Robbins model, which includes the development of a therapeutic/musical relationship through the act of improvising together (Young, 2013). Typical goals for this intervention include: engage in an interpersonal and/or musical relationship, enhance creativity and/or self-expression, focus on the here and now experience, make choices, connection to sense of self, and enhance sense of self-worth**.**

**Givens and fundamental procedures.** It is assumed that the following conditions are in place when this intervention is used:

- Initial and ongoing assessment by the music therapist determines that improvisation is indicated for this client to address one or more of the above goals and that no contraindications for improvisation have been determined.
- The client wants to participate in improvisatory experiences with the music therapist.
- The music therapist has secured a safe and appropriate environment.
  The fundamental procedures are as follows:
- The music therapist determines the client's willingness to make  instrument choices.
- The music therapist plays an instrument in a supportive manner, providing musical and verbal cues to help the client engage with the chosen instrument(s).

- The music therapist observes the client's outward expressions and reactions to the improvisation (i.e., verbal reflection, facial expression, body language) for indications of emotional responses.

**Modifying the intervention.**

*Step 1: Screening.* After determining that an individual instrumental improvisation is indicated for the client and that barriers may inhibit his/her participation, specific barriers (i.e., risk factors) and protective factors must be identified. Using the screening tool as outlined previously (see Tables 1 and 2) along with a simple protocol using percussion instruments to determine the risk and protective actors (i.e., physical limitations and strengths) for a particular client. The music therapist also uses this tool to determine potential contraindications for integrating the iPad. A fictitious client named "Anna" will be used to demonstrate.

The results of Anna's screening indicate that her risk factors are limited physical strength and limited range of gross and fine motor functioning in arms and legs. A protective factor is her full range of gross motor functioning in her trunk/neck. Based on this information the music therapist can conclude that barriers exist for participating in the traditional intervention and that the integration of the iPad is indicated.

*Step 2: Selecting.* Once the barriers and strengths have been determined, the music therapist carefully selects a suitable iPad application. The selection is based on three key factors: the client's physical barriers (risk factors), the client's physical abilities (protective factors), and how the iPad application will fulfill the essential components of the original music experience—in other words, the components of the experience that make it therapeutically effective.

The individual instrumental improvisation intervention calls for the Anna to select an instrument that appeals to her most. She may even pre-select more than one instrument to play throughout the improvisation. This means that a singular application with several instrumental choices would be ideal.

Based on the intervention, my clinical experience, and the risk and protective factors, the 'GarageBand' application was selected. This is because the application has a variety of instrument options from which one can select. Furthermore, it can be adjusted to requiring only small movements, which is ideal since the use of the trunk/neck movement is applicable. Furthermore, the GarageBand application was found to be the most widely used application

among music therapists in surveys conducted, suggesting that it is user-friendly and applicable to music therapy practice.

The application may be on the iPad without needing to download it. If this is the case, it will appear in the application section. To download the application, the music therapist first ensures that he/she is connected to the internet. This is done by clicking on 'Settings', 'Wifi' and then switching the on tab so that a green light appears. Next, the music therapist clicks on the 'Play Store' application built into their iPad, types in 'GarageBand', and then taps 'Download.' Once downloaded, GarageBand will appear on the main screen of the iPad.

GarageBand has many features for music making and recording. For the purpose of this intervention, the key features to note are the tab 'Instruments' and the 'Setting' icon which appears in the form of a wrench image. By clicking on the Instruments tab at the top left corner, the screen should shift to displaying several instruments. To browse through them, a swipe to the left or the right is required. The instruments available are: keyboard, drums, guitar amp, audio recorder, sampler, smart drums, smart strings, smart, bass, smart keyboard, and smart guitar. Within each of these instruments are further options for choosing a preferred instrument. For example, by tapping on the keyboard, the middle of the screen indicates 'Grand Piano'. Tapping on the 'Grand Piano' opens up a myriad of options including, soul organ, synthetic leads, classic keyboard, and much more. This feature can be found within each of the instruments.

The settings icon, on the top right can be tapped to find a variety of important options. The key feature under 'settings' for the individual instrumental improvisation is that of the Key. By tapping 'Key', the music therapist can preselect the key of the instrument. Near to this there is another icon, entitled 'Scale' which can help the music therapist to select the specific scale if desired. Scales available include; major pentatonic, harmonic minor, mixolydian, and more. Further selections can be made based on the specific instrument chosen. For example, if choosing the guitar – selections to which chords that are displayed for playing can be made.

Based on the identified risk and protective factors, the music therapist determines how the client can most optimally play the application. Based on Anna, it was determined that she will be using the motion of her upper trunk (head and neck) to play the iPad instruments. Next, the music therapist can determine if any additional materials are needed to execute the experience (refer to the Appendix for a list of additional materials that may be of benefit). Music therapists may also need to further explore the kinds of products that Apple has for this purpose.

In this scenario, an iPad stand, iPad pen, head-strap or head-mount helmet, and medical tape would be helpful. The iPad stand should be adjusted so that the screen is high enough to face the client's head from a seated position. The music therapist can then place the headmount on the client, while placing the pen on the head strap using tape.

Step 3: Adjusting. The music therapist allows the client to try out the application and asks them for feedback (e.g., what does she think of the sound quality). Special attention is then paid to discussing the idea of playing the instrument with trunk movement, as this is likely an unusual concept and experience for Anna. As long as she is open to the use of the iPad and no further contraindications emerge, the music therapist consults with other professionals at the long-term care facility (if applicable and possible). Occupational therapists and physiotherapists can help the music therapist to make sure the resident will not become overly fatigued by herneck and head, and help to determine the POR. In this case Anna's POR would be directly in front of her at a distance in which she can comfortably sit back and not play, and can lean forward purposefully to play. If the iPad is placed too closely, it can become difficult for the client to stop playing. An occupational therapist may be able to work closely with the music therapist to provide and/or configure the head strap and iPad pen combination for optimal use.

Step 4: Integrating. The music therapist first finds a private space, ideally with a range of supportive instruments (e.g., piano, guitar, percussion, etc.) that they can use to improvise with the client in a variety of styles and progressions. The music therapist allocates extra time for setting up the iPad and additional materials. If more than one iPad is available, the music therapist might consider accompanying/supporting the client on the iPad, to normalize the experience and create a stronger sense of connection and therapeutic relationship. Throughout each session the music therapist pays particular attention to the construction of the headmount and iPad pen, making sure it is appropriately placed as to not cause any discomfort or further anxiety. If Anna is having difficulty playing, the music therapist may need to make an adjustment to her POR and/or check for fatigue. Throughout the improvisatory the experience, the music therapist continuously check for signs of satisfaction with instrument choice and provides opportunities for Anna to decide to continue with the instrument or switch to another one that is available on GarageBand. If Anna would like to switch to another instrument, the music therapist can facilitate this change by showing her the variety of instruments on the application once more. Depending on the control of the iPad pen that the Anna has, and on her

level of cognitive functioning, she may eventually be able to make this choice on her own without the direct assistance of the music therapist.

## Chapter 5. Discussion

The results of this current study provide a framework for two interventions that music therapists can use if they have determined that iPad technology might allow their client to actively participate in indicated music therapy experiences that they would not otherwise have access to due to physical limitations. The re-designed traditional music therapy interventions were constructed using four essential steps: screening, selecting, adjusting, and integrating. Embedded within these steps, the reader will find sample barriers (risk factors), sample strengths (protective factors), fundamental procedures, and suggested adaptations of the original intervention protocols.

Limitations of the research will now be presented. The research process and results also revealed potential implications for practice and research that will be discussed.

### Limitations

This study had a number of limitations, which must be acknowledged. Due to the large variety of types of impaired physical mobility, the researcher was only able to provide examples that highlighted particular risk and protective factors. Music therapists will need to further adapt these interventions to meet their particular clients' needs. Although the interventions were informed by the researcher's clinical experience, they have not been used extensively in practice nor were they tested for effectiveness within this research context. It is also important to note that iPad applications change rapidly, thus potentially limiting the applicability of the some of the results over time, particularly the specific details on how use the application.

Given the researcher's previous experiences in utilizing technology in long-term care, she may have made some assumptions that inadvertently imposed limitations on the study design and applications of the results. The researcher assumed that: (a) technology will continue to gain an increasingly important role in our society, and therefore, it will have ongoing and evolving potential for use in music therapy contexts; (b) music therapists will be open to incorporating technology into their clinical practices with older adults; (c) music therapists will be willing to familiarize themselves with new technology in order to use it effectively with their clients; and (d) many older adults will be open to using technology in their music therapy sessions.

### Implications for Practice

Although previous research indicated that technology/the iPad can be useful for music therapy clients, concrete examples on how to integrate it into interventions was lacking. The

results of this study provide concrete guidelines for music therapists on how to start doing this with older adults in long-term care who have physical mobility limitations. These results may also have some applicability for other clinical populations. By using the screening tool and conceptualizing the four steps (screening, selecting, adjusting, and integrating) within their own clinical contexts, music therapists can help to ensure that they are integrating the iPad only when it is clinically indicated.

Based on my clinical experiences and reflections that occurred during this research process, I had some additional realizations. Aside from helping clients to reach their therapeutic goals and participate in the music therapy experiences, I also observed that when staff members of the long-term care facility were included in the process of integrating the iPad or witnessed the positive outcomes, they became more aware of the abilities and possibilities that the client with impaired physical mobility can achieve. With this shift in perspective there can be more positive interactions with the clients, and this can lead to an overall improvement in the quality of care at the long-term care facility.

I also believe that integrating the iPad into sessions might be one way to help music therapists to exercise their creativity and avoid burnout. Sometimes, music therapists can fall into the pattern of playing the same instruments and singing the same songs day after day, due to client preferences and/or established practices at long-term care facilities. Integrating various iPad applications into interventions is one of many ways in which music therapists can be challenged, re-invigorated, learn new tools, and expand their creativity and musical horizons in innovative and ongoing ways.

Finally, I hope that this study can be used as research support to help music therapists advocate to receive facility funding for an iPad in long-term care facilities. Not only can it make interventions more accessible for many clients, it is cost effective in terms of the wide variety of music experiences it can offer and it does not require significant storage space.

**Implications for Research**

The re-creative and improvisational interventions redesigned in this study to incorporate the iPad should be tested with participants in long-term care and subsequently refined based on the results. Further research could develop and test additional redesigned interventions in all four areas of music experiences as outlined by Bruscia (2014): re-creative, improvisational, receptive, and compositional.

Future research could also examine how to integrate the iPad into music therapy experiences for varying populations in long-term care other than that of older adults with impaired mobility. Potential studies could focus on older adults with dementia or younger adults transitioning into long-term care facilities. Adversely, the focus of research to come could examine specific physical conditions such as: Parkinson's disease or Cerebral Palsy, and determine the most effective way to integrate the iPad based on impairments that accompany the condition itself.

It would be interesting to conduct a study that examined older adults' experiences in utilizing technology in music therapy to determine their perspectives on how it impacted their sessions. It would be also be interesting to conduct a survey among Canadian music therapists to examine their use of technology in sessions. This could lead to a larger conversation about technology in music therapy and to the development of a wider database of practical ideas and reference materials for clinicians.

**Implications for Training**

The literature suggested that credentialed music therapists and music therapy students see the need for incorporating technology into practice, yet they feel that they have had a lack of training in this area (Cevasco & Hong, 2011; Hadley, Hahna, Miller, & Bonaventura, 2014). The results of the current study along with the results of the research ideas suggested above can be used to develop workshops to help music therapists integrating the iPad into their work. These workshops could take place at national or provincial music therapy conferences and other educational contexts. Given that using technology is part of pre-professional and advanced music therapy competencies (American Music Therapy Association, 2013; Canadian Association for Music Therapy, 2014), educational programs that are not already doing so need to make a deliberate effort to incorporate the use of technology into their music therapy curriculums. Additionally, in order to make strides in this area, the professional competencies need to be updated. By making sections on technology more specific and thorough, music therapists may make further efforts to seek additional training and become more aware and knowledgeable of the array of tools they can select from when addressing client needs.

**Conclusion**

This study provides clear implications for practice, research, and training. Most importantly, it provides significant implications for music therapy clients who can potentially

benefit from the integration of the iPad into interventions. An older adult with impaired physical mobility might be assessed as being unable to actively participate in music therapy experiences, despite being able to benefit therapeutically. It is my hope that this paper will inspire music therapists to utilize their creativity in these circumstances, continue to think outside of the box, and persist in working toward overcoming barriers for the benefit of their clients.

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# Appendix

## Additional Materials for Integrating iPad

| Name | Description | Link |
|---|---|---|
| iPad Stand | A flexible stand upon which to place the iPad at various heights and directions. | http://www.staples.ca/en/Stands-Mounts/cat_CL200620_2-CA_1_20001 |
| Bluetooth Speaker | Compact speaker that connects wirelessly to iPad device and enhances volume and sound. | http://www.bose.ca/controller?url=/shop_online/digital_music_systems/bluetooth_speakers/index.jsp |
| iPad Stylus | The iPad stylus is designed as a pen to touch the iPad screen that can be hand held or attached to an object. It comes in various styles and thickness based on accuracy needs. | http://www.macworld.co.uk/feature/ipad/best-stylus-for-ipad-3586503/ |
| iPad Gloves | The iPad gloves have sensors on the fingertips. When the entire hand hits the iPad it will only respond to the areas that the fingertips landed on, making it useful for those with limited fine motor range. | http://www.amazon.com/gp/product/B007FU4O1E/ref=as_li_qf_sp_asin_tl?ie=UTF8&tag=otswiap-20&linkCode=as2&camp=1789&creative=9325&creativeASIN=B007FU4O1E |
| Headmount Helmet | Head pointers are attached to the head (or headband, helmet etc...) and used to point and touch the screen by moving the neck/trunk. | http://atmac.org/stylus-ipad-iphone-complex-variants |