MUSIC THERAPY AND PERCUSSION FOR PERSONS WITH DEMENTIA: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

Music therapy and percussion for persons with dementia: A systematic literature review

Jaclyn Bell

Dementia is a progressive deterioration in cognitive ability that affects many people worldwide. As cognitive and verbal skills decline, persons from this population who are involved in music therapy require more diverse music therapy interventions. Persons with dementia may gradually lose the ability to sing as the disease progresses and the use of percussion may allow for continued musical participation. This research is a systematic literature review of the use of percussion with persons with dementia in music therapy and non music therapy contexts. From 2005 to 2014, many resources were published on the use of percussion in music therapy and non music therapy contexts for persons with dementia. This review examines the literature in terms of the professionals, the stages of dementia, the prevalence of group versus individual settings, the percussion instruments described, the experiences used, the goals targeted, and the results of experimental studies on the use of percussion for persons with dementia. The findings may serve as a resource for clinicians, students, and researchers, and has the potential to increase knowledgeable use of diverse percussion interventions in music therapy and non music therapy contexts for persons with dementia.

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Chapter 1. Introduction

Dementia, major or minor neurocognitive disorder (American Psychiatric Association [APA], 2013), is a progressive deterioration in cognitive ability that affects 35.6 million people worldwide (4.4 million in North America) and the number is expected to nearly double every 20 years (Prince et al., 2013). The damage to brain cells that is present in dementia can affect thinking, behavior, and feelings (Alzheimer's Association, 2014b).

Currently, there is no cure or treatment for dementia, only medications and therapies to temporarily improve or alleviate symptoms (Alzheimer's Association, 2014b). Music interventions have been used in music therapy (Ashida, 2000; Cevasco & Grant, 2006; Hanson, Gfeller, Woodworth, Swanson, & Garand, 1996; Ledger & Baker, 2007; Raglio et al., 2013; Suzuki et al., 2004; Svansdottir & Snaedal, 2006) and non music therapy contexts to provide various kinds of support for persons with dementia (Schindel Martin et al., 2004; Sung, Lee, Li, & Watson, 2012). These music interventions may entail singing, reminiscence, playing instruments, drumming and rhythm activities, listening to music, musical games, songwriting, moving to music, and improvisation (Ridder, 2005; Young, 2013).

While singing seems to be a widely-used and researched intervention for persons with dementia in music therapy (Mchugh, Gardstrom, Hiller, Brewer, & Diestelkamp, 2012; Ridder, 2003; Ridder & Aldridge, 2005; VanWeelden & Cevasco, 2007) and non music therapy contexts (Camic, Williams, & Meeten, 2011; Davidson & Almeida, 2014; Götell, Brown, & Ekman, 2000; Marmstål Hammar, Emami, Engström, & Götell, 2010; Osman, Tischler, & Schneider, 2014; van der Vleuten, Visser, & Meeuwesen, 2012), it is likely that active participation in singing activities may decrease and potentially cease as cognitive abilities decline (Clair & Bernstein, 1990a; Olderog Millard & Smith, 1989). Since cognitive abilities and verbal skills can decline as dementia progresses, there is need for a more diverse range of accessible and engaging music therapy interventions. Studies have shown that rhythm interventions can sometimes elicit more of a response than singing (Brotons & Pickett-Cooper, 1994; Hanson et al., 1996). Interventions that use percussion may allow persons with dementia to participate in rich and stimulating music experiences even in advanced stages of the disorder. Given this, a careful examination of percussion interventions in this area could be useful. This study aims to compile and organize the music therapy and non music therapy literature on the use of percussion for persons with dementia in a systematic literature review.

Personal Relationship to the Topic

My passion for playing percussion in concert bands and jazz bands, and my love of interacting with seniors in long-term care are two significant factors that motivated me to pursue a career in music therapy. During my music therapy training, I noticed that the few music therapists I observed seemed to use song singing as their primary intervention in long-term care, making minimal use of percussion instruments with persons who had dementia. These observations led me to believe there may be potential for increased and purposeful use of percussion instruments with this population. Furthermore, as I believe that it is important to incorporate aspects of my musical self into sessions, I want to explore how my primary instrument (percussion) could be used more effectively in my own music therapy practice with the population.

Assumptions

Having had some internship experience with persons with dementia, I assume that most persons with dementia appreciate music. I also have the assumption that persons with dementia, regardless of stage, have the potential to benefit from the clinical use of music, and more specifically percussion, whether actively or receptively. The influence of these assumptions will be explored later in the Limitations section of this thesis.

Key Terms

For the purpose of this study, a number of key terms are identified and defined as follows:

Music therapy. Music therapy is defined as "the professional use of music and its elements as an intervention in medical, educational, and everyday environments with individuals, groups, families, or communicates who seek to optimize their quality of life and improve their physical, social, communicative, emotional, intellectual, and spiritual health and wellbeing" (World Federation of Music Therapy, 2011, para. 2). A certified music therapist carries out the music therapy session.

Non music therapy contexts. Non music therapy contexts are those in which the person conducting music experiences is not clinically trained as a music therapist nor does the person have any direct guidance from a music therapist. Non music therapy contexts include experiences and approaches such as "music-therapeutic caregiving" (Brown, Götell, & Ekman,

2001); music and healing (Chiang, 2008); bedside musicians, musicians on call, music practitioners, sound healers, music thanatologists, nursing care (Bumanis, 2014); and recreation therapy, therapeutic music, music performance groups, music entertainment, music education, psychotherapy, and other creative arts therapies where no music therapist is present.

Percussion. Percussion is defined as instruments that are considered part of the orchestral percussion department; this includes instruments that are struck, rubbed, scraped, or shaken (Montagu, 2011). This includes membranophones, which produce sound through a vibrating membrane or skin (e.g. drums); and idiophones, which produce sound through vibrating the whole body (e.g. xylophones, cymbals; Matney, 2004a). It excludes the piano, which is considered to be in the chordophone family (Musical Instrument Museums Online, 2011).

Use of percussion. Use of percussion, or a percussion experience, is defined as a technique or organized activity using "percussion approaches, instruments, and methods as a way to elicit a desired behavioral response" (Donovan, 2014). This will include percussion used in both music therapy and non music therapy contexts.

Dementia. Dementia is defined as a neurodegenerative disease resulting in cognitive impairments and behavioral symptoms. It will include older adults with Alzheimer's disease, vascular dementia, dementia with Lewy bodies, frontotemporal dementia, and others (APA, 2013; Prince et al., 2013), as well as any stage ranging from early to late.

Chapter Overview

After providing a general introduction in Chapter 1 and an identification of the researcher's personal interest in the topic, Chapter 2 will outline the rationale and need for the research through a brief literature review, the purpose, operational definitions, delimitations, and the research questions. Chapter 3 will cover the research methods used, including search strategies, selection criteria, and data analysis procedures. Chapter 4 will present the results. Chapter 5 will include a discussion overviewing the results of the research, with an examination of the challenges and limitations, future research considerations, and implications for practice.

Chapter 2. Brief Literature Review

Dementia

Dementia is caused by neurodegeneration in the brain and may include Alzheimer's disease, vascular dementia, dementia with Lewy bodies, frontotemporal dementia, and others (APA, 2013; Prince et al., 2013). Alzheimer's dementia, which is caused by damage to the hippocampus – the center for learning and memory, is the most common dementia (Alzheimer's Association, 2014b). Vascular dementia, which occurs after stroke, is the second most common dementia (Alzheimer's Association, 2014b).

As there is a variety of dementia types, there is also a variety of symptoms. According to the Alzheimer's Association (2014b), two of the following areas must be significantly impaired for a diagnosis of dementia: memory, communication and language, ability to focus and pay attention, reasoning and judgement, and/or visual perception. According to *The Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; DSM-5; APA, 2013), the cognitive deficits interfere with the individual's independence in everyday activities, do not occur only during delirium, and are not explained by another mental disorder. There are also many behavior symptoms that may arise during the progression of the disease. Particularly in the early stages, persons with dementia may display mood disturbances such as irritability, elation, anxiety, and/or depression (Alzheimer's Association, 2014a; APA, 2013). In the later stages many behavior symptoms appear commonly including psychotic features, paranoia and other delusions, apathy, and sleep disturbances; and possibly hallucinations, agitation, aggression, distress, wandering, restlessness, disinhibition, and hoarding (Alzheimer's Association, 2014a; APA, 2013). Persons with dementia may also be seen sitting with their eyes closed or apparently staring (Clair & Bernstein, 1990b). They may not initiate interactions with others and might not respond to interactions with others (Clair & Bernstein, 1990b).

Some of these behavior symptoms can often be attributed to environmental triggers, drug side effects, discomfort from other conditions, and/or uncorrected hearing or vision problems rather than the disease itself (Alzheimer's Association, 2014a). There is not one simple way to test for dementia; the diagnosis is based on medical history, physical examination, laboratory tests, changes in thinking, daily functioning, and behaviors that are associated with the dementias (Alzheimer's Association, 2014b). Evidence of cognitive decline may be based on the concern of

the individual, someone who knows the individual well, a clinician, or a standardized test or similar clinical assessment (APA, 2013). Dementia is classified according to three stages of severity: mild which is characterized by memory lapses or concentration problems; moderate which is characterized by noticeable difficulties in performing tasks, confusion, and personality or behavioral changes; and severe in which an individual is fully dependent and may lose communication skills (Alzheimer's Association, 2016).

The Use of Music in Non Music Therapy Contexts for Persons with Dementia

Since there is currently no cure for dementia, caregivers and health providers seek to relieve the symptoms of dementia. Psychologists, caregivers, exercise instructors, activity therapists and other health professionals, have been documented using music as a method of relief in treating persons with dementia (Abreu & Hartley, 2013; Davidson & Almeida, 2014; Götell, Thunborg, Söderlund, & Heideken Wågert, 2012; Johnson & Taylor, 2011; Karkou & Meekums, 2014; Khoo, van Schaik, & McKenna, 2014; Kumar, Das, Chatterjee, & Dey, 2012; Lin et al., 2011; Marmstål Hammar, 2013; Politis et al., 2004; Raglio et al., 2012; Ragneskog & Kihlgren, 1997; Sakamoto, Ando, & Tsutou, 2013; Samson, Clément, Narme, Schiaratura, & Ehrlé, 2015; Sung, Chang, Lee, & Lee, 2006; Sung et al., 2012; Smith, 2010; van der Vleuten et al., 2012; Van de Winckel, Feys, & De Weerdt, 2004; Wu et al., 2014).

Nursing studies have shown that music interventions can decrease anxiety levels (Sung et al., 2012) and reduce agitation in persons with dementia (Ragneskog & Kihlgren, 1997; Sung et al., 2006). More specifically, a medical researcher found that agitation, physically-aggressive behaviors, verbally non-aggressive behaviors, verbally-aggressive behaviors, and physically non-aggressive behaviors decreased following music interventions (Lin et al., 2011). Occupational therapists have suggested the use of music paired with reading, writing, and drawing (Kumar et al., 2012), as well as relaxing music to decrease aggression while eating (Johnson & Taylor, 2011). Psychologists have found that active and passive music sessions can improve emotional states (Samson et al., 2015) and have recommended personalized music interventions and an active music approach (Raglio et al., 2012). Professional caregivers have found humming and singing to help with caregiving tasks such as during mealtimes and transfer situations (Götell et al., 2012; Marmstål Hammar, 2013). Physiotherapists have used music with persons with

dementia to help coordination of movements (Abreu & Hartley, 2013; Van de Winckel et al., 2004).

Exercise instructors have also used music, including participants' preferred songs, in their exercise programs for persons with dementia (Khoo et al., 2014; Wu et al., 2014). It has also been common for dance movement therapists to use music in their work with persons with dementia, which may positively impact cognition, mood, and social interaction (Karkou & Meekums, 2014). A group facilitator leading singing activities with persons with dementia and their caregivers received positive reports including improvements in lucidity, mood, relaxation, and focus (Davidson & Almeida, 2014). Music facilitators found improvement in emotional state, as well as increased relaxation and reduced stress, and reduced affective disturbance and anxieties and phobias, after individualized music interventions (Sakamoto et al., 2013). Activity therapists have utilized musical instrument kits in therapy with persons with dementia (Politis et al., 2004). Musicians have also been involved in music programs with persons with dementia (Smith, 2010; van der Vleuten et al., 2012). In summary, a variety of practitioners have used music as a tool in working with persons with dementia.

The Use of Music Therapy for Persons with Dementia

While non music therapists may use music in helpful ways, these initiatives often depend on each individual's personal knowledge and comfort level in using music within their own scope of practice. Music therapists are specifically trained in musical and relational aspects of music that are informed by music therapy theory and research. Many of the therapy interventions provided by music therapists use live music and can be adapted in the moment to meet the presenting needs of persons with dementia. Psychologists who conducted a literature review including music therapy and non music therapy literature, recommended music therapy in order to tailor treatments to meet specific client needs (Raglio et al., 2012). Participation in music therapy sessions by persons with dementia has been shown to increase social behaviors and responsiveness, decrease behavioral symptoms and mood disturbances, and maintain or improve cognition (Ahonen-Eerikäinen, Rippin, Sibille, Koch, & Dalby, 2007; Ashida, 2000; Dobbins, 2005; Ledger & Baker, 2007; Raglio et al., 2013; Suzuki et al., 2004; Svansdottir & Snaedal, 2006; Tuckett, Hodgkinson, Rouillon, Balil-Lozoya, & Parker , 2014).

Improved social behaviors, responsiveness, and cognition. Social behaviors and responsiveness in persons with dementia have been found to improve during music therapy sessions. Music therapy provides persons with dementia the opportunity to participate in social gatherings (Tuckett et al., 2014). After 5 days of group reminiscence music therapy for persons with dementia; positive affect, on-task behavior, active participation, and passive participation were observed (Ashida, 2000). Caregivers have also reported that music therapy can have a temporary psychosomatic effect as observed through facial expressions and positive mood/behaviors (Tuckett et al., 2014). Persons with dementia may also be able to work through difficult feelings within group music therapy sessions which can promote enhanced social skills, intimacy, self-confidence, joy, and hope (Ahonen-Eerikäinen et al., 2007). Scores on the Mini-Mental State Examination (MMSE) have remained stable with the "language" subscale improving after 8 weeks of music therapy for persons with Alzheimer's disease and vascular dementia (Suzuki et al., 2004). Music therapy has been identified as a way to evoke memories and support reminiscence for people with dementia as well as a way to exercise the mind with the use of musical games (Tuckett et al., 2014). Music therapy effectively assists in allowing persons with dementia to function in a more social context, to increase in responsiveness, and to maintain or improve cognition.

Decreased behavioral symptoms and mood disturbances. Music therapy has also shown a positive effect on the behavioral symptoms and mood disturbances that arise with dementia. Depressive symptoms have been seen to decrease after 5 days of group reminiscence music therapy for persons with dementia (Ashida, 2000). Suzuki et al. (2004) observed a decrease in irritability for persons with dementia participating in music therapy groups, as well as a decreased stress response as observed in autonomic adrenal system activity. Irritability, agitation, anxiety, apathy, delusions, aberrant motor activity, and nighttime behavior disturbances have been found to improve with music therapy for persons with Alzheimer's disease or vascular dementia (Raglio et al., 2013). Agitation during music therapy, at nighttime, and during diaper changing decreased in one client with vascular dementia (Suzuki et al., 2004). After 6 weeks of music therapy groups, activity disturbances, aggressiveness, and anxiety may be reduced in persons with moderate or severe Alzheimer's disease (Svansdottir & Snaedal, 2006). Ledger and Baker (2007) found less verbal aggressive behavior during music therapy sessions for persons with mid-late stage Alzheimer's disease. It was also observed that during

and immediately after sessions, there was less wandering, fidgeting, grabbing or insulting others, yelling, complaining, making anxious statements, and asking repetitive questions (Ledger & Baker, 2007). Lastly, group and individual music therapy sessions may reduce symptoms of depression (Dobbins, 2005). As seen by these studies, music therapy can decrease the negative behaviors and moods that are associated with dementia.

The Use of Rhythm for Persons with Dementia

Rhythm is a fundamental element in music and is a phenomenon that is experienced continuously in regular life; it is seen, heard, and experienced in our walking and sleeping patterns, heart rates, neural processes, and body motions (Matney, 2004a). Persons with dementia are able to respond to rhythms and produce rhythms, often even automatically, by clapping, singing along, tapping fingers or feet, or dancing (Ridder, 2003; York, 1994). As observed in music therapy sessions, even as overall cognitive capacities decline, rhythmic abilities including imitation of steady beat, change in dynamic level, and change in tempo, seem to be conserved (Lipe, 1995). Persons with dementia who can no longer remember the lyrics when singing, may still sing with accurate rhythm (Allen-Williams, 2013). Neuropsychologists found that while patients with mild Alzheimer's disease had a deficit in their central timekeeping mechanism, there was no deficit in motor response to rhythmic stimuli (Duchek, Balota, & Ferraro, 1994). In music therapy sessions, persons with dementia have also shown greater positive behaviors when presented with a complex rhythmic accompaniment (syncopated and percussive strumming) compared to a simple rhythmic accompaniment (Groene, 2001).

Persons with dementia are also able to respond to rhythms through motor movements by entraining to rhythmic stimuli. During morning care routines where caregivers sang to persons with dementia, "movements seemed to mirror the rhythm of the music" (Götell, 2003, p. 35). Music therapists found that persons with late stage dementia were able to entrain to both rhythmic auditory stimulation (RAS) and the rhythmic sway of the restorative aids that were supporting them while walking (Clair & O'Konski, 2006). During social dance activities, persons with dementia respond and move both automatically and consciously to the various rhythms of the dance music (Palo-Bengtsson & Ekman, 2002; Palo-Bengtsson, Winblad, & Ekman, 1998; Ridder & Wheeler, 2015). Physiotherapists have also found that persons with

dementia can use rhythmic auditory stimulation from salsa music as a cue for movements (Abreu & Hartley, 2013).

Percussion Interventions in Music Therapy for Persons with Dementia

For persons with dementia, there may be a preference or increased responsiveness for interventions involving the use of percussion. It has been recommended to use active music and music therapy approaches for more effective results with persons with dementia (Raglio et al., 2012). Compared to passive music interventions (e.g., listening to music), interactive music interventions have shown reduction in paranoid and delusional ideation, aggressiveness, and activity disturbance, as well as a significant reduction in behavioral and psychological symptoms in general (Sakamoto et al., 2013). In a study that examined individuals with moderate to severe Alzheimer's disease, participation was higher for playing instruments, dancing, or playing games compared to composing/improvising (Brotons & Pickett-Cooper, 1994). Singing activities seemed to invoke more passive involvement than rhythm or movement activities, especially as dementia progresses. During singing activities, individuals with more advanced dementia may be disruptive for longer than persons at a middle stage dementia (Hanson et al., 1996). In a group case study, even the one individual who was able to sing displayed a longer response time when playing percussion instruments than when he was singing (Clair & Bernstein, 1990a). Instrumental touch (the use of touch to assist in playing a musical instrument or moving a scarf to music) is also effective for prompting and sustaining alert behavior states and perceived as facilitating better rapport than physical touch alone (Belgrave, 2006).

The Need for a Systematic Literature Review

In summary, this brief review of the literature emphasizes the importance of percussion interventions for persons with dementia. Since many persons with dementia respond so positively to rhythm, there is potential for music therapists to expand the use of percussion with persons with dementia. While there is an increasing number of studies that describe percussion interventions used for persons with dementia, there is not yet a systematic literature review on this topic. With the growing numbers of persons with dementia and the vast number of needs and symptoms, there is a strong need for a systematic literature review to organize, analyze, and integrate the information to help music therapists understand and utilize the diverse range of percussion interventions that can be used with persons with dementia.

Statement of Purpose

The purpose of the study was to complete a systematic review of the literature; this review would serve to identify and describe the use of percussion in music therapy and non music therapy contexts for persons with dementia, as well as to identify the needs that are addressed by these interventions and the projected outcomes. The use of percussion in non music therapy contexts was included because of its great prevalence, with many professionals and institutions recognizing the value of music with persons with dementia.

Primary Research Question

What does the literature indicate about what and how percussion is used in music therapy and non music therapy contexts with persons with dementia?

Subsidiary research questions.

1. What percussion instruments are used in music therapy and non music therapy contexts with persons with dementia?
2. What specific percussion experiences are used in music therapy and non music therapy contexts with persons with dementia?
3. What needs do the use of percussion aim to address?
4. In the case of research studies, what are the results of the use of percussion in music therapy and non music therapy contexts with persons with dementia?

Chapter 3. Methodology

This study was a systematic literature review, which is a summary of the research literature related to the research question (Hanson-Abromeit & Moore, 2014). This research methodology was chosen as the most effective way to answer the primary research question; it compiles and summarizes the literature about the way percussion has been used with persons with dementia by music therapists and non music therapists. Several authors have performed effective systematic literature reviews in the field of music therapy (Aigen, 2008a, 2008b; Brotons, Koger, & Pickett-Cooper, 1997; Matney, 2015; Tung, 2014). These publications were used as a reference for the design and creation of this research methodology. The aim was to gather as much related literature as possible and organize it into appropriate categories for analysis.

Search Strategy

A research plan and search strategy was created in order to identify relevant literature for the defined topic and question area. The intention for the search strategy was to discover literature in the field of music therapy, music, percussion, music medicine, music recreation, and geriatrics. This included searching through selected electronic databases and print resources.

Electronic Databases Search Strategy

There were a total of 29 databases searched (See *Table 1*). When searching databases, the same keywords were used: music, music therapy, music recreation, percussion, rhythm, drum, dementia, Alzheimer's disease. In the top search box, the terms "percussion" or "drum" or "rhythm" were used, with "dementia" or "Alzheimer's disease" in the secondary search box.

Search Strategy for Edited Books

Books were identified through electronic searches and hand searches of the literature. Books were electronically searched for with titles, chapter titles, or keywords that were relevant to the research topic, and a hand search was used to further examine the book to determine if it meet the search criteria.

Table 1

Electronic Databases Searched

Academic Search Complete
British Humanities Index
Canadian Music Periodical Index
Education Source
ERIC
Google Scholar
Index to theses
International Index to Music Periodicals
JSTOR
Oxford Scholarship Online
Percussive Arts Society Online Research Thesis/Dissertation Repository
Project MUSE
ProQuest dissertations and theses
PsycARTICLES
PsycINFO
Psychology and Behavioral Sciences Collection
PubMed Central
PubMed (Medline)
RILM abstracts of music literature
SAGE Research Methods
Scopus
Social Sciences Abstracts
SocINDEX
Taylor and Francis Arts and Humanitities Archive
Web of Science
Wiley-Blackwell Backfiles
Wiley-Blackwell Cochrane Library
Wiley-Blackwell eBooks Library
Wiley-Blackwell Journals

Search Strategy for Peer-Reviewed Journals

Articles within music therapy and non music therapy journals were searched by electronic means and by hand searching. There were 12 music therapy journals (See *Table 3*) and 43 non music therapy journals searched (See *Table 2*).

Table 2

Non Music Therapy Journals Searched

Activity Director's Quarterly
Age and Aging
Aging Clinical and Experimental Research
Aging and Mental Health
Alternative Therapies in Health and Medicine
Alzheimer's & Dementia
American Journal of Occupational Therapy
Annual in Therapeutic Recreation
Archives of Gerontology and Geriatrics
Arts & Health
Arts in Psychotherapy
Australasian Journal on Ageing
Australian Occupational Therapy Journal
British Journal of Occupational Therapy
Canadian Journal of Occupational Therapy
Complementary Therapies in Medicine
Dementia
Dementia and Geriatric Cognitive Disorders
Instrumentalist
International Musician
International Review of the Aesthetics and Sociology of Music
International Journal of Geriatric Psychiatry
International Journal of Gerontology
International Journal of Nursing Studies
Internet Journal of Geriatrics and Gerontology
Journal of Advanced Nursing
Journal of Aging and Health
Journal of Applied Behavior Analysis
Journal of the American Geriatrics Society
Journal of Clinical Nursing
Journal of Creativity in Mental Health
Journal of Percussion Pedagogy
Journal of Physical Education, Recreation and Dance
Journals of Gerontology
Music & Arts in Action
Music and Medicine
Open Journal of Occupational Therapy
Oxford Scholarship Online
Percussive Notes
Percussionist
Percussion News
Psychology of Music
Therapeutic Recreation Journal

Table 2

Music Therapy Journals Searched

Australian Journal of Music Therapy
British Journal of Music Therapy
Canadian Journal of Music Therapy
Journal of Music Therapy
Music Therapy Index
Music Therapy Perspectives
Music Therapy Today
New Zealand Journal of Music Therapy
Nordic Journal of Music Therapy
Qualitative Inquiries in Music Therapy
Voices: A World Forum for Music Therapy

Selection Criteria

After consideration of the research plan, the following criteria were established for selecting literature:

1. Publications included were peer-reviewed journal articles, book chapters, master's theses, doctoral dissertations or scholarly internal documents examining qualitative and/or quantitative data on the use of percussion with persons with dementia in music therapy and non music therapy contexts.
2. Publications included persons who actively or receptively participated in group or individual sessions.
3. Only English language literature published and/or updated between January 2005 and December 2014 was included.

Inclusion Criteria and Issues of Quality

Resources were checked for quality in regards to scholarly and peer-reviewed processes. The resources that were included were scholarly articles and book chapters that were peer-reviewed and/or from recognized music therapy or non music therapy publishers. All literature included was informative and relevant to the topic of percussion interventions used with older adults with dementia.

The use of percussion as a programmed activity or intervention was included. Body percussion was included as percussion if it was referred to specifically as body percussion.

Literature that was included consisted of quantitative and qualitative studies, case studies, surveys, and session plans.

Exclusion Criteria

Non peer reviewed literature like blog articles, articles from webpages, and self-published books were excluded from the study as well as article and book reviews, memoirs, literature reviews, conference proceedings, and editorial articles. Poster presentations and abstracts were also excluded, as they did not contain sufficient information. Duplicate articles were omitted and the most recently published article was excluded, as this was the selection method used by Matney (2015). The most recently published article was often a condensed journal article, while the first published article was often a dissertation, which included more details on the percussion experiences used.

Further exclusion criteria were created in order to produce a more specialized list. Electronic percussion was excluded as it fits more in the category of electronic instruments than percussion instruments. Clapping and tapping the body was excluded unless it was specifically referred to as body percussion. Recordings of percussion instruments were excluded. This study included literature that referred to programmed activities, therefore excluding reports such as participating in drum lessons or playing percussion independently in their own time. Literature that grouped people with dementia together with other populations (i.e. well older adults, other psychiatric disorders, etc.) was excluded. Hand bells and tone chimes were excluded, since those instruments use primarily structured interventions and activities by nature (i.e. hand bell choirs).

Literature was further eliminated if there was no detail in the description of its use and if the intervention was solely playing percussion instruments along to music (recorded, live, or singing) in an unstructured manner.

Developing Systematic Review Guide and Templates

Since the analysis of literature is highly important for obtaining results in the qualitative systematic literature review, other systematic literature reviews were used as models and guides to the research process. A template was designed following the suggestions and modifying the template of Tung (2014).

Data Analysis Procedure: Implementing the Template for Analysis

Once each resource was retrieved, it was analyzed using a template comprised of nine categories (See *Table 4*). This template was firstly used to decide if they each met the criteria for inclusion, and then as a tool for gathering data. Similar to Tung's (2014) model, each source of literature was analyzed twice, with the first time being used to adjust the template according to adapt to issues that emerged in the readings.

Table 3

Analysis Template

Author, Publishing Venue, and Report Characteristics
Author (single, multiple)
Year of publication
Publishing venue
Type of context (music therapy or non music therapy)
Topic and Focus of Study
Group or individual context
Client group studied (stage of dementia)
Goals targeted/needs addressed
Research Method and Procedures
Percussion instruments used
Description of how percussion is used
Research Findings
Results from use of percussion

Data Analysis Procedure: Tables Creation and Representation

The publications that met the inclusion criteria were categorized and analyzed according to the research questions. These categories were entered into a table organizing the information according to author, year of publication, publishing venue, professional context, group or individual context, client group, goals targeted, instruments used, description of how percussion was used, and findings. Tables were also created to visually display how many percussion instruments were used, how percussion is used, needs being addressed, and study results. These tables will be presented in Chapter 4.

Chapter 4. Results

Search Process and Article Location Results

After searching the literature, 145 sources were found on the topic of percussion use for persons with dementia using the specified key terms. Of those, 30 sources were eliminated because they were not scholarly. Another 29 articles were eliminated: 14 sources that talked about rhythmic clapping and tapping but did not refer to it as body percussion; one article that talked solely about the use of tone chimes; 13 sources that talked about dementia grouped with another population; and one article on electronic percussion. Five duplicate sources were eliminated.

At this point, further articles were eliminated that did not give any detail in the description of percussion use and that only used percussion in an unstructured way to play along to music (recordings, live music, and/or singing). Unstructured playing along to music interventions eliminated 19 sources: seven from music therapy contexts and 12 from non music therapy contexts. Literature that gave minimal description of the use of percussion included 29 sources (See *Table 5*); 12 from music therapy contexts and 17 from non music therapy contexts. In the end, 33 articles remained to be examined in this systematic literature review. Of the 33 sources that were included in the literature review, there were 14 theses and dissertations, 12 articles, five book chapters, one internal document (an unpublished document produced by an organization), and one book.

Table 4

Number of Sources Eliminated with Minimal Descriptions

Playing/Drumming	14
Improvisation	6
Not specified	5
Prop/Object	2
Rhythm band	1
Game/Craft	1

Stages of Dementia

Percussion experiences were used for persons with dementia across the whole range of stages within dementia. Persons with early, middle and late stage dementia participated in

percussion experiences in the literature. Early-stage dementia was sometimes referred to as mild dementia and scored between 21 and 25 on the MMSE. Middle-stage dementia was sometimes referred to as moderate dementia, classified as moderately severe cognitive decline, and scored between 11 and 20 on the MMSE. Late-stage dementia was sometimes referred to as advanced dementia or severe dementia, classified as severe cognitive decline, and scored between 0 and 10 for the MMSE. While some specifically worked with one stage of dementia, there was often a range of dementia stages like early and middle stage or middle to late stage persons with dementia grouped together. Some studies did not report on the specific stage of dementia within which their clientele fell, so were categorized as "Not Specified." Table 6 shows the occurrence of the different stages of dementia represented in this literature review. Music therapy literature spanned across all stages of dementia, while the non music therapy literature focused on middle to late stage dementia or did not specify the stage.

Table 5

Stages of Dementia By Frequency of Mention

Early	1
Early-Middle	5
Middle	4
Middle-Late	8
Late	7
Not Specified	11

Music Therapy and Non Music Therapy Contexts

The majority of sources described percussion experiences that occurred within a music therapy context or involved a music therapist as a consultant. This included interventions carried out by music therapists as well as interventions that were designed by music therapists for caregivers or activity leaders to carry out. Non music therapy professionals included musicians, occupational therapists, nursing staff, and drama therapists (See *Table 7*). Non music therapists included a musician using percussion as an accompaniment to singing, professional musicians teamed up with an occupational therapist, an occupational therapist who used percussion in a sensory stimulation intervention, a musician and nursing staff who had spent time observing music therapists, and a drama therapist who used percussion in a non-musical way.

Table 6

Frequency of Professional Contexts That Used Percussion

Music Therapy		**28**
Music therapist	26	
Music therapy designed for activity leader	1	
Music therapy designed for caregivers	1	
Non Music Therapy		**6**
Musician	2	
Musicians & an occupational therapist	1	
Nursing staff	1	
Occupational therapy designed for nursing staff	1	
Drama therapist	1	

Group versus Individual Settings

Percussion experiences were utilized in individual and group settings for persons with dementia. Groups varied in size from two to 15 persons with dementia, and often group sizes were not specified (See *Table 8*). Individual and small group (two to three persons) settings were used a little more with middle to late stage dementia compared to early to middle stage dementia. Music therapy designed for caregiver implementation targeted individuals, while music therapy designed for activity leader implementation targeted a small group of four persons. Music therapists were the only ones who used large group sizes of up to 15 persons with dementia and they also used individual settings more frequently than non music therapy contexts (e.g., one half of the time compared to one third of the time for non music therapy contexts). Groups sometimes included family members, roommates, and/or caregivers.

Table 7

Frequency of Group and Individual Settings

Group		**26**
Unspecified size	11	
Small group (2-3)	2	
Group (4-10)	10	
4-6	4	
4-8	4	
6-10	2	
Group (up to 15)	3	
Individual		**17**

Percussion Instruments Used

A variety of percussion instruments were used for persons with dementia in music therapy and non music therapy contexts. Instruments were classified according to the categories established by Matney (2004b). Concussion instruments "make sound by striking parts of themselves against each other" and refer to a variety of shakers, blocks, clappers, and scrapers (Matney, 2004b). The category of scrapers included guiros and cabasas. Strikers refer to mallets, beaters, drumsticks, and adapted mallets. Ambient percussion referred to rain sticks, ocean drums, and wind chimes. Jingle sticks were categorized as a tambourine.

Drums and concussion instruments were the most commonly used, followed by metal percussion, ambient percussion, pitched percussion, strikers, unspecified percussion, and body percussion (See *Table 9*). Shakers, maracas, and egg shakers were the most common concussion instruments used, with over half of the concussion instruments consisting of this subcategory. Over half of the drums were unspecified drums, unspecified hand drums, or unspecified large drums. Some authors were more specific in describing their instruments: 10-inch paddle drum and LP maraca (Cevasco & Grant, 2006), mini plastic woodblock (Chiang, 2008), 10-inch hand drum (Dimaio, 2010), wrist bells (Gold, 2014), turtle guiro (Justus, 2014), 14 x 28-inch djembe and 8-cm x 30-cm small hand drum (Quinn, 2011), small and large ocean drum (Dalby et al., 2005), and large ghetto drum (Burns, 2009).

Recommendations. In addition to listing the specific percussion instruments that were used or suggested in the literature, recommendations were made on features and considerations to look at when selecting percussion instruments for use with persons with dementia. Many talked about the importance of using percussion instruments that were appropriate to the participant's ability level (Belgrave et al., 2011; Rio, 2009; Young, 2013). Young (2013) and Rio (2009) encouraged the facilitator to take culture into consideration when choosing instruments. Percussion instruments should be age-appropriate, high quality, and well-made (Rio, 2009; Young, 2013). Rio (2009) specifically recommends high quality human-made fiber skins for drums so they can be cleaned easily. Young (2013) advised to avoid startling sounds but to select instruments that make a clear sound when played so that participants can successfully create a rhythmic pulse. Claves create a richer sound quality than rhythm sticks and different mallets can create different volumes and timbres (Rio, 2009).

Table 8

Percussion Instruments By Frequency of Mention

Drums			**44**
Unspecified		15	
Hand drums		8	
Paddle drums		6	
Djembes		4	
Large drums		3	
Bongo drums		2	
Buffalo & frame drums		2	
Dombeks		1	
Klong yaos		1	
Turbano drums		1	
Adaptive drums		1	
Concussion instruments			**42**
Shakers, maracas, & egg shakers		24	
Clappers		9	
Claves	6		
Rhythm sticks	2		
Castanets	1		
Blocks		7	
Woodblocks	3		
Temple blocks	3		
African log-slit drum	1		
Scrapers (Guiros, cabasas)		2	
Metal Percussion			**27**
Tambourines		9	
Cowbells/Jingle bells/Agogo bells		6	
Triangles		5	
Unspecified cymbals		5	
Finger cymbals		1	
Gongs		1	
Ambient Percussion (Rain sticks, ocean drums, chimes)			**14**
Pitched Percussion			**13**
Xylophones		5	
Glockenspiel		3	
Tone bars		1	
Steel drums		1	
Indonesian bamboo percussion		1	
Metallophone		1	
Unspecified		1	
Strikers (Sticks, mallets)			**11**
Unspecified percussion			**8**
Body percussion			**1**
TOTAL			**160**

Percussion instruments also need to be easy to hold and play (Ragni et al., 2005; Rio, 2009; Young, 2013). Shakers, claves, and the handle on a paddle drum are examples (Rio, 2009). Instruments may need to be placed on the lap for persons with severe dementia (Young, 2013). Versatility is important for creating multiple ways to be able to play instruments (Rio, 2009). Tambourines can be played in multiple ways and mallets add versatility to the way hand drums can be played (Rio, 2009). Weight, safety, and the number of hands required to play the instrument should also be considered (Rio, 2009). Young (2013) suggests softer instruments for those who cannot keep the beat. Percussion instruments may need to be adapted in order to make them more accessible (Young, 2013).

Choice. With the wide variety in percussion instruments, clients were often given a choice of instrument (Cevasco, 2010; Dimaio, 2010; Geyer, 2008; Ki, 2012; Pyykonen, 2013; Quinn, 2011; Dalby et al., 2005). Depending on the ability of the client, they may have been given a choice between two different instruments (Dimaio, 2010; Quinn, 2011; Dalby et al., 2005) or the option to pick from a wider variety of percussion instruments (Quinn, 2011). Participants in Pyykonen's music project (2013) were very involved in selecting instruments that would reflect a specific character in their performances. If a choice was not made, Geyer (2008) put instruments on a nearby table. Clients often chose instruments that they had used in previous sessions (Pyykonen, 2013) or that were easy to play and recognizable (Ragni et al., 2005).

Percussion Experiences

Categorization. Experiences were categorized using Das and Matney's (2010) drum intervention categories and created to include a variety of percussion instruments (See *Table 10*). The six categories comprised of drum play, traditional drumming, drum accompaniment, guided interactive drumming, improvisation, and technique-oriented play. Sub-categories were created based on the literature found and defined for this research project. Clinical improvisation and non-clinical improvisation were categorized together as improvisation due to the similarity in types of percussion experiences used. There are inherent differences between clinical and non-clinical improvisation, though most improvisation experiences were not described in the literature in enough detail to identify these differences. The percussion experiences may have taken place individually or in combinations. For example, Cevasco and Grant (2006) combined Kodály syllables, structured playing along to music, and rhythm patterns in one activity. In some

cases percussion interventions were used alone; at other times they were used in sequence with other music or non-music interventions.

Table 9

Frequency of Percussion Experiences in Music Therapy and Non Music Therapy Contexts

Guided Interactive Drumming		**32**
Rhythm patterns	10	
Rhythmic imitation	7	
Basic pulse	4	
Exploring tempos and volumes	4	
Word rhythms	2	
Melodic imitation	2	
Stopping and starting	2	
Two parts	1	
Improvisation		**29**
Unstructured	9	
Supported by therapist	8	
Musical conversation	5	
Theme	4	
Receptive	1	
Drum Play		**18**
Instrument exploration	7	
Instrument introduction	5	
Sensory stimulation	3	
Creating a threshold	1	
Games	1	
Soundscape	1	
Drum Accompaniment		**18**
Structured playing along to music	8	
Movement	6	
Storytelling	2	
Song writing	1	
Receptive	1	
Traditional Drumming		**10**
Solo over fixed accompaniment	4	
Pre-composed music	2	
Performance	2	
Kodály syllables	1	
Creating a recording	1	
Technique-Oriented Play		**6**
Instrument demonstration	6	

Definitions. The percussion experience categories and subcategories were defined as follows:

- Drum play included pre-musical or non-music experiences utilizing percussion instruments (Das & Matney, 2010). This included the following sub-categories:
    - Soundscape: the representation of non-musical environmental sounds on percussion instruments. This could include imitating the sound of raindrops or of a heartbeat using percussion instruments.
    - Instrument exploration: experimenting with the feel and sound of a musical instrument. It includes bringing attention to the sounds that an instrument makes and exploring the sensory qualities (Collier, 2007).
    - Sensory stimulation: the client participates in vibrotactile, visual and/or aural stimulation with a percussion instrument. The client may be encouraged to touch and hold the instrument while either the client or therapist plays it.
    - Creating a threshold: using an instrument to signal the beginning and end of a session.
    - Games: non-musical activities that use percussion for fun and engagement.
    - Instrument introduction: talking about the instrument name, context, origin, and/or elements.
- Traditional drumming included experiences that are based on techniques, structures, and rhythms based in cultural tradition or teachings (Das & Matney, 2010). These interventions included the following sub categories:
    - Solo over fixed accompaniment: using an improvisation section in a song or musical piece.
    - Kodály syllables: using the syllables created by Kodály in teaching rhythms on a percussion instrument.
    - Pre-composed music: interventions where pre-composed music is used as a structure for playing percussion instruments.
    - Performance: the use of percussion instruments in a performance or concert setting.
    - Create a recording: the process of preparing a piece with percussion instruments to create a recording and to listen to it when it was complete.

- Drum accompaniment included interventions that used percussion as a way of accompanying and playing along to music; percussion is not the focus of the intervention, but secondary to the main musical material (Das & Matney, 2010).
    - Structured playing along to music: using percussion instruments in a meaningful or structured way to accompany live music, recordings, singing, and/or chanting.
    - Movement interventions: leading movement exercises or sequences to recorded music while using percussion instruments as a prop. The percussion instruments are used to provoke or maximize movements (Young, 2013).
    - Song writing: using percussion instruments to accompany a song written by the client(s).
    - Storytelling: using percussion to accompany the telling of a story.
    - Receptive: the use of percussion by the facilitator or therapist to accompany music for the client to listen to without participating actively in playing an instrument.
- Guided interactive drumming included structured and directed activities with instructions, guidelines, cues, and redirections from a therapist or facilitator (Das & Matney, 2010).
    - Basic pulse: playing a basic beat together and entraining to a common beat.
    - Rhythm patterns: a variety of rhythm patterns that are introduced and repeated together. This could include simple or complex rhythm patterns.
    - Word rhythms: playing the rhythm of someone's name or using other words, like food names, as the basis for repeated rhythmic patterns.
    - Rhythmic imitation: the leader or a participant presents rhythms for the rest of the group to imitate or repeat in a call and response manner.
    - Melodic imitation: a leader presents melodic segments for another person to imitate or repeat in a call and response manner.
    - Stopping and starting: using cues to stop and start the production of sound.
    - Exploring tempos and volumes: using cues to signal increases and decreases in tempo and volume.
    - Two part interventions: dividing the large group into smaller groups and assigning each a rhythm to play simultaneously.

- Improvisation includes "any combination of sounds and sounds created within a framework of beginning and ending" within a clinical or non-clinical setting (Wigram, 2004, p. 37). Clinical improvisation uses musical improvisation as a "technique in clinical work" aimed to meet the needs of the client (Wigram, 2004, p. 37).
    - Unstructured: giving clients the freedom to play in whatever way they are able (Gold, 2014) or whatever way they feel like playing without imposing musical rules (Rio, 2009). In the case of clinical improvisation, the music therapist determines when it is appropriate to follow, support, or lead the improvisation based on cues from the client (Beer, 2011).
    - Musical conversation: improvisations that took place in a back and forth manner between the client and facilitator.
    - Receptive: improvisation by the therapist while the client listens.
    - Theme: improvisation based on a specific theme, story, emotion, or topic.
    - Supported by the therapist: the therapist listens to the client's sound contributions and develops them musically using piano, guitar, percussion, or voice.
- Technique-oriented play included the use of motor and coordination techniques for playing percussion instruments (Das & Matney, 2010).
    - Instrument demonstration: demonstrations and instructions on how to play the instruments.

Music therapy and non music therapy contexts. The different categories of interventions were used across all stages of dementia. Overall, guided interactive drumming and improvisation were the most commonly used percussion interventions; these were followed by drum play, drum accompaniment, traditional drumming, and technique-oriented play. Non music therapists used drum play most commonly following by traditional drumming, drum accompaniment and guided interactive drumming, improvisation, and technique oriented play (See *Table 11*). Most interventions were interspersed with other musical or non-musical activities, except for one thesis, which described a 12-minute music therapy percussion protocol for activity leaders (Coury, 2013).

The occupational therapy exercises concentrated on instrument exploration and sensory stimulation. The drama therapist used percussion in drum play to create a threshold for the session. Musicians used structured playing along to music, performance and pre-composed

music, receptive improvisation, instrument demonstration, and instrument introduction. Nursing staff used percussion to accompany movement and to create rhythm patterns. When musicians and an occupational therapist worked together, they used performance, solos over fixed accompaniment, sensory stimulation, games, basic pulse, rhythm patterns, themed improvisations, and accompaniment for storytelling. Caregivers and activity staff, who were trained by music therapists, used instrument exploration, soundscape, drum accompaniment for movement, guided interactive drumming, and unstructured or musical conversation improvisation.

Both music therapy and non music therapy contexts used improvisation experiences of theme, unstructured, and musical conversation. Musical performances, creating a threshold, and games were only used in non music therapy contexts. Interventions carried out only by music therapists included Kodály syllables, creating a recording, song writing accompaniment, receptive drum accompaniment, melodic imitation, stopping and starting, two parts, and improvisations supported by the therapist. Rhythmic imitation, word rhythms, exploring tempos and volumes, musical conversation, and unstructured improvisation were only carried out by music therapists or persons trained by music therapists.

Table 10

Frequency of Percussion Experiences in Non Music Therapy Contexts

Drum Play	6
Traditional Drumming	4
Drum Accompaniment	3
Guided Interactive Drumming	3
Improvisation	2
Technique-Oriented Play	1

Description. While all articles gave at least a brief description of what the percussion experience entailed, there were some articles that gave more in-depth descriptions on the use of percussion. Three articles included notated rhythm patterns and other details that were used in the percussion interventions that would allow parts or the whole of the interventions to be replicated. Two articles listed the instrumental songs that they used to accompany the drumming

as well as the rhythm patterns used (Cevasco, 2010, p. 289; Cevasco and Grant, 2006, pp. 233-234). Coury (2013) included a very detailed description of the 12-minute rhythm activity, which included room set up, training protocol for activity leaders, data collection forms, music for the chant, and rhythmic notation for the call and response.

Goals

Goals that were identified for the participants with dementia were categorized under the following domains: cognitive, communication, music, physical, emotional, psychological, social, spiritual, cultural, quality of life, and assessment (See *Table 12*). Cognitive, social, quality of life, psychological, and emotional goals were present across the different stages of dementia. Communication and physical goals were more frequent in the middle to late stages of dementia. Music goals were present for early to middle stage dementia but not in the later stage. Percussion interventions were used in assessment for persons with middle to late stage dementia by music therapists only. Music therapists used goals across the whole range of categories and most of the subcategories. Non music therapists set a similar number of goals across all goal domains except music, quality of life, and assessment goals were seen less frequently. Music therapy activities designed for non music therapists covered the goal domains of cognitive, communication, and social. Most sources mentioned goals, except one survey article which did not touch on this area and one music therapy thesis which did not mention goals. The most common goal targeted social interaction (16 sources). See Appendix A for specific goals under each broad category.

Table 11

Goal Domains for Percussion Experiences

Cognitive	40
Social	33
Physical	27
Psychological	23
Emotional	20
Communication	13
Musical	6
Quality of Life	5
Assessment	4
Cultural	3
Spiritual	1

Results Identified in the Literature

Results from the use of percussion for persons with dementia were categorized in a similar fashion as the goals (See *Table 13* for general overview; See *Appendix B* for detailed results). Fourteen sources did not have results to report on for one of the following reasons: there were no results because it was not a research study (nine sources) or the research results were unrelated to the use of percussion (five sources). A total of 19 of the sources were research studies with results related to the use of percussion for persons with dementia. Many of the results from these sources were based on music therapy sessions that included the use of percussion as well as activities that did not use percussion (16 sources; two of these sources involving mostly percussion experiences). Coury's (2013) thesis focused solely on a percussion session. Cevasco and Grant (2006) focused their results and experiment solely on the use of percussion, although other musical activities were interspersed between percussion experiences.

There were no studies that found negative results from the use of percussion for persons with dementia. Five studies found areas that exhibited no significant change after the use of percussion for a span of time. One such study gave three music therapy sessions across the span of 1 week and did not find a change in task performance and problem solving skills, though positive results were found for engagement and social interaction (Aslakson, 2010). Quinn (2011) gave three 1-hour sessions each week for 3 weeks (a total of nine sessions) and found no change in language functioning, MMSE, depression, or memory scores. Ragni et al. (2005) found no difference in attention after three 45-minute sessions each week for a month and but significant differences were found in MMSE and memory scores. Snyder (2012) gave weekly 45-minute sessions for 8 weeks and found no change in quality of life ratings. After 6 weeks of 45-minute sessions four times a week, Gildar (2010) found no significant difference in language functioning though other improvements were observed.

One source (Cevasco, 2010) talked about greater positive affect when the music therapist demonstrated affect and proximity during music therapy, though positive affect was the lowest during rhythm activities. There were four articles that focused on the use of percussion specifically. Geyer (2008) mentioned that the clients who played rhythm instruments were more active and remained in the session longer. One article focused on using music and percussion as an assessment tool (Lipe, York, & Jensen, 2007). They found particularly strong relationships between the rhythm and verbal component of the Music-Based Evaluation of Cognitive Function

(MBECF), between the rhythm component and total MMSE score, and between the Residual Music Skills Test (RMST) rhythm and total MMSE score.

Table 12

Frequency of Results from the Use of Percussion

Category	Positive Difference	No Difference	Total
Cognitive	15	5	20
Social	18	0	18
Emotional	12	1	13
Music	8	0	8
Communication	4	2	6
Physical	6	0	6
Quality of Life	5	1	6
Psychological	5	0	5
Assessment	3	0	3
TOTAL	76	9	85

Chapter 5. Discussion

After presentation of the findings in Chapter 4, this final chapter looks at an overview of the results, the challenges and limitations of this research study, and recommendations for future research and clinical practice. After searching the literature for sources on the use of percussion with persons with dementia, 33 sources were found that met the inclusion criteria. These included theses, dissertations, articles, book chapters, an internal document, and a book.

Stages of Dementia

Every stage of dementia was represented in the literature: from early to late. As noted in the assumptions earlier and seen from the representation of all stages in the literature, it appears that a person at any stage of dementia is able to participate in activities utilizing percussion instruments, whether actively or receptively. Middle to late stage dementia had a higher representation in the literature than early to middle stage. This is likely due to the fact that persons with mid- to late-stage dementia are the ones who are typically in care homes where structured and musical activities, like music therapy, are offered and available. Persons with dementia are usually admitted to care homes after their needs exceed the resources of their family caregivers (Clair, 2015). One study found that the majority of persons with dementia who were admitted into the nursing home had MMSE scores within the moderate to severe dementia range (Yaffe et al., 2002).

Although many sources specified the level of dementia that was being targeted, almost a third of the sources did not. The groups may have included a mixture of dementia stages, although Martin et al. (2011) discourage the combination of stages unless the persons with advanced dementia are able to find meaningful connections in the group activities. Another possible reason that stage was not specified could be the lack of access to a specific dementia diagnosis. It may take years between initial symptom recognition and diagnosis, and there is a lack of routine screening (Boise, Morgan, Kaye, & Camicioli, 1999). Of those who showed positive results from a dementia screening, one half refused further diagnostic assessment (Boustani et al., 2005). Sometimes the classification of stage is seen as irrelevant as a person reaches the later stages (Collier, 2007). Since there can be drastic changes in symptoms and needs as dementia progresses, however, not knowing the stage of dementia can substantially hinder treatment. Since skills and abilities decline as dementia progresses, it is important to know what percussion activities are successful with each stage and how they can be used for targeting

treatments appropriately. Activities need to be aimed specifically for a person's level of comprehension (Byrne, 2014), abilities, interests, pace, and level of participation, or a person can become restless, agitated, or fall asleep (Martin et al, 2011).

Music Therapy and Non Music Therapy Contexts

The vast majority of sources were from a music therapy context, two of which were music therapy designed for an activity leader or caregiver. Only six of the 33 articles were from a non music therapy context.

While non music therapists do use percussion with persons with dementia, music therapists have some discipline-specific knowledge that can contribute to successfully implementing percussion experiences. A group of music educators thought that it would be easy to engage a group of older adults musically; they came to realize that they needed guidance, and to know about the musical backgrounds and needs of their clients in order to engage with them in a meaningful way (Lum, 2011). Another reason for the smaller representation of non music therapy use of percussion was due to the exclusion of articles discussing unstructured drum accompaniment or those with no description of the use of percussion. While both music therapy and non music therapy sources were eliminated in this step, there were a greater number of non music therapy sources eliminated. Music therapists, with their specialized training in the use of percussion with persons with dementia, may have been more likely than non music therapists to explain the musical interventions that they used and to describe them in greater depth. All of the non music therapists who passed the inclusion criteria had training in either music or therapy, or had shadowed a music therapist. Many were educated in an area of therapy or healthcare and were using percussion instruments as a tool to reach a goal.

It was also interesting to note that some non music therapy contexts did make reference to music therapy in the literature. It indicates varying levels of awareness of the music therapy profession. Hara (2011) made references to music therapy but clearly stated that what she was doing was "music and health" or "community music," not music therapy. Justus (2014), a musician, made references to and observed a music therapist in her dissertation, yet her work with the clients was not referred to as music therapy. Ki (2012) chose to call her intervention "music intervention" as opposed to "music therapy," though she commented that it "does not imply that any difference in therapeutic effects exists between music therapy and music

intervention" (p. 21). She also made arguments that music therapy can be carried out by nurses with some musical knowledge.

Group versus Individual Sessions

Percussion experiences were used in both group and individual settings for persons with dementia. Group settings were used slightly more often than individual settings. Over half of the group sizes were reported in the literature, though many were not. Four to ten persons with dementia was the most common group range. Individual or small groups were more common for the later stages of dementia (mid- to late-stage). Individual settings were more common to music therapy than non music therapy contexts.

The greater frequency of group sessions could be due to funding and logistics. Music therapy and other music activities may be more affordable when offered as a group format since more people can benefit from the activity at once. Care homes are probably more likely to run groups since they are cost effective and reach multiple residents at once with a meaningful activity.

Groups can have many benefits for a person with dementia. In a group, individuals have opportunities to socially and musically interact with their peers and neighbors. A group can create energy, increase attention, prevent withdrawal, and motivate individuals to control negative behaviors (Feil & de Klerk-Rubin, 2012). Brotons (2000) found that individual and small groups of three to five people were most successful for elderly populations. Small groups may more easily build the sense of empowerment for individuals (Nashimoto, Onchi, & Maruyama, 2007).

Group music therapy may be more appropriate for persons with mild and moderate stages of dementia, while persons with severe dementia may respond better with individualized activities (Chu et al., 2014). As dementia symptoms increase or worsen, clients in smaller groups can be given more individual attention, more personalized interventions, and more purposeful assistance. Facilitators are also better able to control the level of stimulation (Chu et al., 2014), especially when percussion instruments are in use and participants may be particularly sensitive. Young (2013) suggests that the more advanced the stage of dementia, the smaller the group should be. For clients with advanced dementia, Martin et al. (2011) aimed for individual sessions or tried to use groups with a maximum of three persons in order to provide opportunities for

meaningful connections throughout the session. Groups of four or more may result in the clients receiving attention "on a rotating basis" (Martin et al., 2011, p. 161). If groups are greater than six people, it is recommended to have other caregivers to give individual attention to group members (Martin et al., 2011). Individual sessions are also helpful for assessment sessions in getting to know the individual before joining a group (Lecourt & Fertier, 2012).

Percussion Instruments

A variety of percussion instruments were mentioned in the literature for persons with dementia. Drums and concussion instruments were the most commonly used percussion instruments, followed by metal, ambient, pitched, strikers, unspecified, and body percussion. Drums may be a popular instrument due to the instinctive rhythmic component and the vibrotactile feedback. Barry Bernstein maintained that the drum was the most accessible instrument because it allows for immediate involvement in music making (as cited in Friedman, 2000). A drum positioned between the knees may create greater participation because it is easily accessible and provides vibrotactile feedback (Clair & Bernstein, 1990a; Clair, Bernstein, & Johnson, 1995). Certain concussion instruments (shakers, maracas, egg shakers, claves), tambourines, and bells (cowbells, jingle bells, agogo bells) may have also been used relatively frequently with persons with dementia because they are portable, relatively inexpensive, durable, and easy to play (Crowe & Ratner, 2010).

Considerations and recommendations. Recommendations for percussion instruments to use for persons with dementia included instruments that were age-appropriate, culturally appropriate, high quality, suited to ability level, and easy to play. Since most of the instruments in this literature review were not described in detail, it is hard to determine if they represent age-appropriate, culturally-appropriate, or high-quality instruments. The main concern with age-inappropriate activities is the infantilization of the persons with dementia through the use of objects that are socially inappropriate or undignified for the person's actual age (Mahoney, 2003). Some instruments to avoid would be maracas, rhythm sticks, and xylophones that are designed for children. The presence of multi-ethnic instruments is increasingly vital in our diverse society (Reuer, Crowe, & Bernstein, 2007). Typically, high quality instruments are age appropriate since they are legitimate instruments that would be used by professionals. The use of

instruments should be a positive and interesting experience for persons in all stages of dementia (Byrne, 2014).

Accessibility. As seen in this literature review and in other literature, instrument accessibility is very important for persons with dementia, and the skill required needs to match skill ability (Lecourt & Fertier, 2012; Ragio, 2010). A person with late stage dementia may not be able to coordinate two-handed percussion instruments, so the facilitator must determine the appropriate instrument fit. Matney (2004b) explained one-handed versus two-handed skills required for specific percussion instruments (p. 25). Percussion instruments in general are smaller and more accessible than other instruments, and therefore they do not create physical or musical boundaries for a client (Matney, 2004a). Elements of accessibility, such as weight and handles, have been taken into consideration when designing percussion prototypes (Byrne, 2014). Weight and dexterity is an important consideration as clients are declining in their abilities. The use of mallets or beaters can also add versatility and accessibility to percussion instruments.

Adaptations. Instrument adaptations were not mentioned very often in the literature but it could be because percussion instruments are accessible in general. Of the 33 articles, Belgrave et al. (2011) was the only one who mentioned an adapted instrument though he did not describe in detail the adaptive drums that were used in the study. Small changes in instrument designs can make a great difference in goal achievement (Crowe & Ratner, 2010). Because percussion is versatile and can be positioned in different ways, adaptations are possible (Matney, 2004b). The literature has mentioned ways to adapt percussion instruments for persons with dementia: bracelets with bells for persons with severe praxia dysfunction (Clément, Tonini, Khatir, Schiaratura, & Samson, 2012), a two-person cabasa to promote intergenerational interaction (Crowe & Ratner, 2010), use of the feet or a mallet to play the tambourine (Rio, 2009), and textured drumsticks or a drum stick holder (Crowe & Ratner, 2010).

Choice. Percussion offers a variety of timbres, shapes, sizes, and dynamics for clients to choose from (Matney, 2004a). Choice making represents a very important opportunity for persons with dementia as they may feel elsewhere like they are not listened to enough and have limited opportunities to participate in making decisions (Tyrrell, Genin, & Myslinski, 2006). Choice is also significant in ensuring engagement (Allen-Williams, 2013). Many of the sources in this literature review mentioned the importance of giving persons with dementia the

opportunity to choose a percussion instrument to play. Even though Ragni et al. (2005) found that instruments with a recognizable shape and material were often selected, there are benefits to the use of both familiar and unfamiliar instruments for persons with dementia. Byrne (2014) found that persons with dementia immediately selected his yarn ball percussion instrument for its familiar shape, yet he also found success with a percussion prototype that had an unfamiliar and interesting shape. Offering unfamiliar instruments can be a great option if it means the client is better able to participate in playing the instrument (Lecourt & Fertier, 2012).

Vagueness. Unfortunately there were sources that did not specify the kinds of percussion or rhythm instruments that were used. There were also many vague mentions of percussion instruments. This included references to cymbals, chimes, xylophones, tambourines, and drums (unspecified drums, hand drums, large drums, and adaptive drums). It is unknown whether authors were referring to toy xylophones or concert xylophones, or tambourines with or without heads. The specific type of mallet (i.e. yarn or plastic) was never specified. Since strikers are not technically an instrument, some sources could have neglected to mention the use of strikers even if they were used. Also unknown is the way instruments were played, as this was not often described. Since percussion instruments are often versatile in the way they can be played, this could be very beneficial information. Knowing the specific percussion instrument can give information on the physiological and cognitive processes that are necessary to play them (Matney, 2015). When the literature is vague, it is difficult to understand how instruments specifically work with and appeal to persons with various stages of dementia. Having more detail on the types and uses of instruments would be greatly beneficial to the world of music therapy.

Percussion Experiences

Overall, guided interactive drumming and improvisation were the most commonly used percussion experiences, followed by drum play and drum accompaniment, traditional drumming, and finally, technique-oriented play. These techniques were used alone or in combination. Allen-Williams (2013) noted that it is best to combine rhythmic activities with other types of interventions in a session. Nugent (2003) suggested that percussion experiences are the most valuable when placed in the middle of a session. Most of these interventions required active participation from the persons with dementia, with only two percussion experiences including receptive interventions. Since persons with dementia may struggle with attention and

concentration, active music making experiences are very important (Mercadal-Brotons, 2011). There also may be a need for either shorter session lengths (as seen in Coury, 2013) or sessions that include a variety of experiences (different percussion experiences as well as other musical or nonmusical activities) in order to maintain engagement and participation.

Adapting to different stages of dementia. The different types of percussion experiences were used with persons representing all stages of dementia. How can such a wide range of percussion experiences be carried out as the disease progresses and skills decline? Participation can continue into the late stages of the disease, even with more creative and spontaneous activities, if musical activities are appropriately adapted to the level of functioning of the client (Brotons, 2000; Lecourt & Fertier, 2012). Ridder and Wheeler (2015) caution that activities led by those lacking in professional expertise can lead to overstimulation and social isolation for the clients. The activity needs to be appropriately complex, within a suitable time frame that will hold the client's attention, and appropriately adapted to the individual's sensory needs (Collier, 2007). Clients need enough time to become fully engaged and to compensate for delayed reaction time in the activities that are offered (Barwick, 2014), yet adequate time to rest and to allow for shorter attention spans (Martin et al., 2011). Music therapists may also adapt their directions for activities by adjusting the length and complexity of instructions, so that participants can understand; one method of such an adaptation is to use short phrases and physical gestures (Gildar, 2010).

A facilitator also needs to know when it is appropriate for clients to play independently and when to offer them assistance in playing instruments. Assisted playing may be used for the purpose of providing a stronger sound on the instrument (Barwick, 2014), to help with cueing or holding the instrument, to initiate participation (Young, 2013), and/or to provide support (Melhuish, 2013). Clients may initially require assistance, but may learn to play independently as time goes on (Pyykonen, 2013). The facilitator is advised to be careful not to impede when it is not necessary, otherwise the participant's reduced activity level could lead to sensory deprivation (Collier, 2007).

Guided interactive drumming is often used with populations that need a high degree of musical support or guidance (Das & Matney, 2010). It is likely that this intervention is used the most frequently for persons with dementia, because they may be unresponsive or exhibit disruptive behaviors when not engaged in structured activities (Brotons & Pickett-Cooper, 1994).

Persons with late stage dementia participate and entrain to rhythms significantly more when musical activities are structured versus unstructured (Clair et al., 1995). This is an intervention that requires the facilitator to have a certain amount of drumming and musical skills (Das & Matney, 2010), and could explain why some guided interactive drumming experiences were only seen in a music therapy context.

Improvisation. Percussion improvisation was the second most common intervention used for persons with dementia, which is no surprise since a large number of music therapists use improvisation, with percussion being the most popular instrument for improvisation (Hiller, 2009). There were many percussion improvisation experiences in both music therapy and non music therapy contexts. Had there been more detailed descriptions on the experiences, a greater difference in clinical and musical improvisation might have been seen. Musical conversations, unstructured improvisations, and improvisations supported by the therapist were the experiences seen only in music therapy contexts. Unstructured improvisations are probably unfamiliar to non music therapists, where improvisation is usually used in a traditional, more structured context. Unstructured improvisations should be used with caution with this population, as persons with dementia may play less, lose contact with the facilitator, and/or get stuck in repetitive or random playing (Bamford & Clift, 2007). Activities that are too unstructured may not be effective (Klages, Zecevic, Orange, & Hobson, 2011).

Drum Accompaniment. Another common intervention found in the literature was the use of percussion as an accompaniment to a song or piece of music. This is very common in music therapy and non music therapy contexts (Das & Matney, 2010; Matney, 2015). The use of song in music therapy is important, as it can provide a sense of security and safety (Clair, 2015), contextual cues, support for communication and companionship, opportunities for reminiscence, and connection to identity (Ridder, 2003). Young (2013) suggested not playing percussion instruments for the whole duration of a sing-along as it may cause overstimulation, but rather selecting specific instruments that match the specific song in a meaningful way.

Bamford and Clift (2007) emphasized the value of using recordings, but cautioned the facilitator to know the recording well and to be aware that the attention may be placed on the recording rather than the instrument playing, and that recordings may cause the percussion playing to be restricted by the dynamics, tempo, pacing, pitch, and format of the recordings. Familiar music may facilitate engagement and provide comfort for persons with dementia (Clair,

2015), though it may not stimulate arousal and engagement to the same extent as novel, rhythmically strong music (Tomaino, 2013).

Music therapy versus non music therapy use of percussion. The types of percussion experiences used more commonly differed between music therapy and non music therapy contexts. The two most common categories within music therapy – guided interactive drumming and improvisation – were the least common for non music therapy contexts. For non music therapy contexts, drum play was the most popular followed by traditional drumming and drum accompaniment. It appears that a major difference between music therapy and non music therapy percussion use for persons with dementia is in the experiences used, as music therapists have specific and comprehensive training in music therapy theories and techniques which prepare them to reach specific goals through music. This sets music therapists apart from musicians or entertainers.

Drum play. Drum play is an experience that is easily accessible for the non musician because it does not require much musical skill for the facilitator or client (Das & Matney, 2010). Even though it does not require much musical skill, it does not mean that it is not an important intervention. Many facilitators, in music therapy and non music therapy contexts, used drum play as a way for clients to get comfortable with and oriented to percussion instruments (Barwick, 2014; Belgrave et al., 2011; Chiang, 2008; Collier, 2007; Geyer, 2008; Gildar, 2010; Justus, 2014; Quinn, 2011; Ragni et al., 2005; Rio, 2009; Dalby et al., 2005; Young, 2013). These facilitators did not neglect to introduce the instrument nor did they assume that the persons with dementia knew how to play the percussion instruments and what they were. Drum play can also be a useful tool for sensory stimulation (Collier, 2007), for interactive games (Pyykonen, 2013), and for creating thresholds (Burns, 2009).

Traditional drumming. In line with Das & Matney (2010), traditional drumming is more common for non music therapy contexts, though it is increasing in interest in music therapy. Musical performances were only found in non music therapy contexts in the current research project. The two authors (Justus, 2014; Pyykonen, 2013) who used the traditional drumming techniques were educated musicians who had knowledge in music and/or percussion. Since musicians are typically exposed to music in a traditional manner, it makes sense that they use more traditional approaches (traditional drumming as well as drum accompaniment) for persons with dementia.

Goals and Results

Both the goals and results of the percussion and dementia literature looked at similar skill domains. Goals covered a range of categories, most commonly including cognitive, social, physical, psychological, and emotional domains. Less commonly mentioned goal areas included communication, musical, quality of life, assessment, cultural, and spiritual domains. Within the domains, cognitive goals were mentioned most frequently, while within the subcategories, social interaction was the most common. Overall, social interaction was the most common goal subcategory. The main goal areas that reported results were cognitive, social, and emotional domains, as well as music, communication, physical, quality of life, and psychological domains.

A majority of the results from the research studies gave positive results and showed a positive difference when percussion was used for persons with dementia. This was a result of either percussion experiences alone or percussion use within the context of other activities. Since many of the research studies reported on results from a whole music therapy session, and not just the percussion segment, it is difficult to determine if the effects are a result of the use of percussion, the other interventions, or a combination of both. However, one of the studies showed that percussion alone can increase the level of engagement of persons with dementia (Coury, 2013).

Cognitive. The frequency of cognitive goals is no surprise considering that cognitive decline is the defining symptom of dementia. The positive impact to cognition may be due to music's ability to create order through rhythmic relationships, sequences, and forms (Chu et al., 2014). While there were many positive results found in the cognitive domain, a few sources found areas within the cognitive domain that had no significant change after the use of percussion. Although dementia is a progressive deterioration, interventions often aim to maintain levels of functioning (Belgrave, 2006).

Communication. Communication goals were commonly unspecified as to what area of communication they were targeting (seven unspecified versus six specified). Since language deficits are a big problem with the later stages of dementia, these goals should be defined more clearly. Allen-Williams (2013) suggested "rhythm lies at the base of music and verbal communication." Since there was discrepancy between findings, it is still unclear as to what effect music has on communication skills for persons with dementia.

Physical and social. Social goals were frequently used, including most commonly social interaction, as well as participation and decreasing disruptive behaviors. Percussion instruments can be arranged to specifically facilitate social interaction (Matney, 2004a). This may be enabled through instrument sharing (Melhuish, 2013; Dalby et al., 2005) or rotating instruments in between interventions (Cevasco & Grant, 2006). Results in this thesis showed an increase in many social areas as well as a decrease in negative behaviors. This is in line with the incompatible response theory, which observes that disruptive behaviors are less likely to occur when the participants are actively engaged in highly structured activities (Belgrave et al., 2011). Physical goals, though not evaluated frequently in this literature, represent an important goal area, because many social activities rely on the ability to move (Collier, 2007) and many persons with dementia have dyspraxia or movement disorders.

Psychological, emotional, spiritual, and cultural. Psychological and emotional goals are important as persons with dementia are facing the loss of skills and autonomy. Results were not commonly reported in the psychological domain, perhaps due to a lack of evaluation measures, especially for later stages of dementia when communication and self-expression is more difficult. Spiritual and cultural goals were mentioned very rarely in the literature. Spirituality is an area that is largely unaddressed for persons with dementia (Kirkland, Fortuna, Kelson, & Phinney, 2014). As functions and skills deteriorate with the disease, culture is an important aspect of identity that a person can connect to in meaningful activities (Martin et al., 2011). Certain rhythms and instruments may allow a person with dementia to connect with their spiritual and cultural identity through the use of culturally-specific percussion instruments and experiences that are spirituality relevant.

Stages of dementia. For all stages of dementia, the goals focused on cognitive, social, quality of life, psychological, and emotional domains. These domains are important for a person coping with dementia and relevant through each stage of progression. Music goals were only present for early- to mid-stage dementia. The lack of musical goals in later stages of dementia could be due to a greater focus on areas of deterioration that are related to everyday functioning and quality of life. Communication and physical goals were more common for mid- to late-stage dementia. As the disease progresses, there is increased difficulty with motor activities and communicating (Alzheimer's Association, 2016).

Assessment. In addition to targeting goals, percussion instruments were used for assessment of a person with dementia by music therapists. Assessment using percussion instruments was not seen in non music therapy contexts. Music therapists are specially trained to use music to assess a person's strengths and weaknesses. They are educated in the use of musical instruments in a clinical context, whereas non music therapists probably do not have the training to make assessments using music. Percussion is a viable approach to assessing skills of persons with dementia and may be closely correlated with the MMSE (Lipe et al., 2007). This is yet another method of assessing the skills of a person with dementia and could potentially add to the breadth of assessment used with a person with dementia. Since doctors may have limited time to assess persons with dementia (Boise et al., 1999), this may be another avenue for monitoring clinical changes of a person's cognitive functioning. It is also a method of assessment that seems less tedious, stressful, boring, and strenuous for a person with dementia and can bring beneficial findings.

Music therapy versus non music therapy contexts. Goals were identified just as often in non music therapy contexts as in music therapy contexts. It is an interesting discovery that brings up questions around goal setting, assessment, treatment, and evaluation. Do music therapists target goals differently given their specialized training in the use of music and music therapy techniques? Some areas that could be further explored include differences between music therapists and other professionals in terms of goal-setting practices, assessment protocols, and the differential roles of assessments in goal setting. It is interesting to find that persons from both music therapy and non music therapy contexts are creating goals and finding results from using percussion and music with persons with dementia. This is in contradiction to Cevasco and Grant's (2006) observation that one thing that differentiates music therapists from others who use music is that music therapists prepare for sessions based on behavioral goals.

No significant differences. There were some studies that found no significant difference after the use of percussion for persons with dementia in some areas. Many studies seemed to just report on positive results. It was unrealistic for some studies to expect significant results in certain domains after very short study periods. While some areas like social interaction and engagement showed significant results after a short treatment period, others areas did not (task performance and problem solving; Aslakson, 2010). These studies suggest that certain areas may need longer treatment periods in order to find significant results. Some persons with dementia

may be unable to participate successfully due to a mismatch between their sensory needs and the level of stimulation offered by the activity (Collier, 2007); overstimulation can take place when an activity is unpleasant for the individual or if the level of sensory processing is too fast for the individual, while too little stimulation can cause sensory deprivation. Percussion instruments may be inappropriate to use with clients who are unable to recognize the function of the instrument or play in a meaningful way, and who are sensitive to certain timbers or find this type of stimulation agitating (Young, 2013).

Challenges

A few challenges of this research project include vague descriptions of interventions and instruments, inaccessibility of some articles, inconsistency in word use, and categorizing of results. Vague descriptions in the literature made it difficult to determine exactly what instruments were being used and for what interventions, and often resulted in the source being eliminated. There was also some inconsistency in the way instruments were named. In some articles it was uncertain if references to a drum and hand drum were referring to the same drum or two different drums. Some literature that could have been greatly beneficial were unable to be accessed due to library access. This was due to some literature only being available in other countries. Wording for goals and names used for percussion instruments were inconsistent within and across sources. This made the categorization of instruments, experiences, goals, and results particularly difficult.

Limitations

This research was limited by a few factors. First of all, it was delimited to English publications. There was potential for more literature to be found had the language not been restricted to English, as many English abstracts were found for articles written in other languages. Also, literature was delimited to scholarly journal articles, books, theses, dissertations, and scholarly internal documents. There are still online sources to be explored as well as a variety of non peer-reviewed literature on the topic. In addition, the choice of search terms was limited to only a few terms, though it could have been more extensive and specific (as seen in Matney, 2015). The findings of the research were also limited by the information that was published and may not be representative of how percussion is used clinically for persons with dementia. Another limitation is that the findings related to percussion improvisation

experiences were grouped together in one category, which included clinical and non-clinical improvisation, while there could be unique differences and distinctions made between these two. Additional limitations existed in that this research did not involve a statistical analysis or meta synthesis of the qualitative studies.

Future Research and Clinical Implications

There are many other areas still to be explored in relation to percussion, dementia, and professional contexts. It is strongly recommended that researchers and authors provide more details when publishing to include the stage of dementia, the specific number of participants in group settings, each percussion instrument offered and chosen by participants and facilitators, and detailed descriptions of the experiences. With this detailed information, investigation could examine the specific aspects of percussion that make it effective as a treatment tool that produces results. Music therapists may want to refer to guidelines for reporting music-based interventions (Robb, Carpenter, & Burns, 2010), and to seek more training specifically on how to report on percussion interventions (Matney, 2015).

Since most of the literature discussed the use of percussion in conjunction with other interventions within a session, future research could explore the appropriate balance of percussion experiences and other activities like singing and movement. It would also be beneficial to look further into instrument adaptations and specific instruments that are more accessible to persons with dementia in order to keep them engaged and participating for longer periods of time. Since spiritual and cultural areas are often unaddressed but highly important needs for persons with dementia, further research and clinical work is warranted to explore how percussion experiences can uniquely address these goals. Finally, many of the music therapy experiences have the potential to be modified for use in a non music therapy context or an interprofessional context; which experiences are most appropriate for this need to be further examined, as does the role of music therapists acting as consultants to others using percussion techniques. Future research could be valuable in identifying which percussion experiences fall within the scope of practice for music therapy, for non-music therapy, and for interprofessional work.

Conclusion

While Matney (2015) conducted a review on the use of percussion across all populations, this study focused solely on persons with dementia and the descriptions of the percussion instruments and percussion experiences used. From 2005 to 2014, many resources were published on the use of percussion in music therapy and non music therapy contexts for persons with dementia. A broad range of percussion instruments and experiences were used in music therapy and non music therapy contexts for persons representing every stage of dementia. These percussion experiences were utilized in group and individual settings to target a range of goals and it produced a range of results. The findings may serve as a resource for clinicians, students, and researchers in music therapy and non music therapy contexts, which could potentially enhance the use of effective percussion interventions for persons with dementia.

References

Abreu, M. & Hartley, G. (2013). The effects of salsa dance on balance, gait, and fall risk in a sedentary patient with Alzheimer's dementia, multiple comorbidities, and recurrent falls. *Journal of Geriatric Physical Therapy, 36*(2), 100-108. doi:10.1519/JPT.0b013e318267aa54

Ahonen-Eerikäinen, H., Rippin, K., Sibille, N., Koch, R., & Dalby, D. M. (2007). "Not bad for an old 85-year-old!" The qualitative analysis of the role of music, therapeutic benefits and group therapeutic factors of the St. Joseph's Alzheimer's Adult Day Program Music Therapy Group. *Canadian Journal of Music Therapy, 13*(2), 37-62.

Aigen, K. (2008a). An analysis of qualitative music therapy research reports 1987-2006: Articles and book chapters. *The Arts in Psychotherapy, 35*(4), 251-261. doi:10.1016/j.aip.2008.05.001

Aigen, K. (2008b). An analysis of qualitative music therapy research reports 1987-2006: Doctoral studies. *The Arts in Psychotherapy, 35*(5), 307-319. doi:10.1016/j.aip.2008.06.001

Allen-Williams, H. (2013). Does rhythm in music therapy have an organising effect on the agitated behaviours of people with a diagnosis of dementia? An investigation into music therapists' current practice. *British Journal of Music Therapy, 27*(1), 32-51.

Alzheimer's Association. (2014a). *Treatments for behavior.* Retrieved from http://www.alz.org/alzheimers_disease_treatments_for_behavior.asp

Alzheimer's Association. (2014b). *What is dementia?* Retrieved from http://www.alz.org/what-is-dementia.asp

Alzheimer's Association. (2016). *Stages of Alzheimer's.* Retrieved from http://www.alz.org/alzheimers_disease_stages_of_alzheimers.asp

American Psychiatric Association. (2013). Neurocognitive disorders. In *Diagnostic and statistical manual of mental disorders* (5th ed.). doi:10.1176/appi.books.9780890425596.dsm17

Ashida, S. (2000). The effect of reminiscence music therapy sessions on changes in depressive symptoms in elderly persons with dementia. *Journal of Music Therapy, 37*(3), 170-182. doi:10.1093/jmt/37.3.170

Aslakson, M. (2010). *The effects of a music therapy intervention on agitation in people with dementia* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (Accession Order No. 3442003)

Bamford, A. & Clift, S. (2007). Southampton silver song club: Reflections on music making with elderly people facilitated by student volunteers. Retrieved from http://create.canterbury.ac.uk/4455/

Barwick, C. A. (2014). *Describing the subtle factors that influence moments of interactive responses during music therapy sessions for people with late-stage Alzheimer's disease and other related major neurocognitive disorders: A multiple case study* (Master's thesis, Appalachian State University). Retrieved from http://libres.uncg.edu/ir/asu/f/Barwick,%20Carey_2014_Thesis.pdf

Beer, L. (2011). A model for clinical decision making in music therapy: Planning and implementing improvisational experiences. *Music Therapy Perspectives 29*(2), 117-125. doi:10.1093/mtp/29.2.117

Belgrave, M. J. (2006). The effect of expressive and instrumental touch on the behavior states of older adults with late-stage dementia of the Alzheimer's type and music therapist's perceived rapport (Master's thesis, Florida State University). Retrieved from http://diginole.lib.fsu.edu/

Belgrave, M., Darrow, A. A., Walworth, D., & Wlodarczyk, N. (2011). Clinical applications for Alzheimer's disease and related disorders. In *Music therapy and geriatric populations: A handbook for practicing music therapists and healthcare professionals* (pp. 39-58). Silver Spring, MD: American Music Therapy Association.

Boise, L., Morgan, D. L., Kaye, J., & Camicioli, R. (1999). Delays in the diagnosis of dementia: Perspectives of family caregivers. *American Journal of Alzheimer's Disease and Other Dementias, 14*(1), 20-26. doi:10.1177/153331759901400101

Boustani, M., Callahan, C. M., Unverzagt, F. W., Austrom, M. G., Perkins, A. J., Fultz, B. A., … & Hendrie, H. C. (2005). Implementing a screening and diagnosis program for dementia in primary care. *Journal of General Internal Medicine, 20*(7), 572-577. doi:10.1111/j.1525-1497.2005.0126.x

Brotons, M. (2000). An overview of the music therapy literature relating to elderly people. In D. Aldridge (Ed.), *Music therapy in dementia care: More new voices* (pp. 33-62). London, England: Jessica Kingsley.

Brotons, M., Koger, S. M., & Pickett-Cooper, P. (1997). Music and dementias: A review of literature. *Journal of Music Therapy, 34*(4), 204-245. doi:10.1093/jmt/34.4.204

Brotons, M. & Pickett-Cooper, P. (1994). Preferences of Alzheimer's disease patients for music activities: Singing, instruments, dance/movement, games, and composition/improvisation. *Journal of Music Therapy, 31*(3), 220-233. doi:10.1093/jmt/31.3.220

Brown, S., Götell, E., & Ekman, S.-L. (2001). 'Music-therapeutic caregiving': The necessity of active music-making in clinical care. *The Arts in Psychotherapy, 28*(2), 125-135. doi:10.1016/S0197-4556(00)00085-X

Bumanis, A. (2014, January 23). *Setting the record straight: What music therapy is and is not*. Retrieved from http://www.musictherapy.org/amta_press_release_on_music_therapy_-_jan_2014/

Burns, A. J. (2009). An interpretive description of the patterns of practise of arts therapists working with older people who have dementia in the UK (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (Accession Order No. U577937

Byrne, B. (2014). Curious things: How can design research assist the development of audio-tactile tools for group music therapy sessions involving participants with dementia (Master's thesis, Massey University, Wellington, New Zealand). Retrieved from http://mro.massey.ac.nz/handle/10179/6947

Camic, P. M., Williams, C. M., & Meeten, F. (2011). Does a 'Singing Together Group' improve the quality of life of people with a dementia and their carers? A pilot evaluation study. *Dementia, 12*(2), 157-176. doi:10.1177/1471301211422761

Carroll, D. & Lefebvre, C. (2013). Sic role-play exercises with predetermined musical and clinical parameters. In *Clinical improvisation techniques in music therapy: A guide for students, clinicians and educators* (pp. 61-74). Springfield, IL: Charles C. Thomas.

Cevasco, A. M. (2010). Effects of the therapist's nonverbal behavior on participation and affect of individuals with Alzheimer's disease during group music therapy sessions. *Journal of Music Therapy, 47*(3), 282-299. doi:10.1093/jmt/47.3.282

Cevasco, A. M., & Grant, R. E. (2006). Value of musical instruments used by the therapist to elicit responses from individuals in various stages of Alzheimer's disease. *Journal of Music Therapy, 43*(3), 226-246. doi:10.1093/jmt/43.3.226

Chiang, M. M. (2008). *Research on music and healing in ethnomusicology and music therapy* (Master's thesis). Retrieved from ProQuest Dissertations and Theses. (Accession Order No. 1453754)

Chu, H., Yang, C.-Y., Lin, Y., Ou, K.-L., Lee, T.-Y., … & Chou, K.-R. (2014). The impact of group music therapy on depression and cognition in elderly persons with dementia: A randomized controlled study. *Biological Research for Nursing, 16*(2), 209-217. doi:10.1177/1099800413485410

Clair, A. A. (2015). Music therapy for people who have Alzheimer's disease. In J. Edwards (Ed.), *The oxford handbook of music therapy* (pp. 384-404). Oxford, United Kingdom: Oxford University.

Clair, A. A. & Bernstein, B. (1990a). A comparison of singing, vibrotactile and nonvibrotactile instrument playing responses in severely regressed persons with dementia of the Alzheimer's type. *Journal of Music Therapy, 27*(3), 119-125. doi:10.1093/jmt/27.3.119

Clair, A. A. & Bernstein, B. (1990b). A preliminary study of music therapy programming for severely regressed persons with Alzheimer's-type dementia. *Journal of Applied Gerontology, 9*(3), 299-311. doi:10.1177/073346489000900305

Clair, A. A., Bernstein, B., & Johnson, G. (1995). Rhythm playing characteristics in persons with severe dementia including those with probable Alzheimer's type. *Journal of Music Therapy, 32*(2), 113-131. doi:10.1093/jmt/32.2.113

Clair, A. A. & O'Konski, M. (2006). The effect of Rhythmic Auditory Stimulation (RAS) on gait characteristics of cadence, velocity, and stride length in persons with late stage dementia. *Journal of Music Therapy, 43*(2), 154-163. doi:10.1093/jmt/43.2.154

Clément, S., Tonini, A., Khatir, F., Schiaratura, L., & Samson, S. (2012). Short and longer term effects of musical intervention in severe Alzheimer's disease. *Music Perception, 29*(5), 533-541. doi:10.1525/MP.2012.29.5.533

Collier, L. (2007). *The use of multi-sensory stimulation to improve functional performance in older people with dementia: A randomised single blind trial* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (Accession Order No. U227564)

Coury, S. N. (2013). *Activity leader facilitation of a rhythm activity to engage persons with late stage Alzheimer's-type dementia: A feasibility study* (Master's thesis). Retrieved from ProQuest Dissertations and Theses. (Accession Order No. 1551153)

Crowe, B. J. & Ratner, E. (2012). The sound design project: An interdisciplinary collaboration of music therapy and industrial design. *Music Therapy Perspectives, 30*(2), 101-108. doi:10.1093/mtp/30.2.101

Dalby, D., Sibille, N., Koch, R., Walker, M., K. Tschirhart, Ahonen-Eerikainen, H., & Rippin, K. (2005, December 1). *Music therapy: Implications for quality improvement and quality of life*. Unpublished internal document, St. Joseph's Health Centre Guelph.

Das, K. & Matney, B. (2010). *A taxonomy of drumming experiences.* Retrieved from http://musictherapydrumming.com/a-taxonomy-of-drumming-experiences-2/

Davidson, J. W. & Almeida, R. A. (2014). An exploratory study of the impact of group singing activities on lucidity, energy, focus, mood and relaxation for persons with dementia and their caregivers. *Psychology of Well-Being, 4*(24). Retrieved from http://link.springer.com/article/10.1186/s13612-014-0024-5

Dennis, P. (2012). *Involving family members of people with dementia in the music therapy process at a residential care facility* (Master's thesis, Massey University, Wellington, New Zealand). Retrieved from http://researcharchive.vuw.ac.nz/handle/10063/2174

Dimaio, L. (2010). Music therapy entrainment: A humanistic music therapist's perspective of using music therapy entrainment with hospice clients experiencing pain. *Music Therapy Perspectives, 28*(2), 106-115. doi:10.1093/mtp/28.2.106

Dobbins, S. R. (2005). The effect of group music therapy interventions and individual music therapy interventions on changes in depressive symptoms in elderly persons with dementia in residential facilities (Master's thesis, Florida State University). Retrieved from http://purl.flvc.org/fsu/fd/FSU_migr_etd-0723

Donovan, J. (2014, January 1). *Percussion Intervention Training Curriculum Overview*. Retrieved from http://www.drumfacilitator.com/pitcurriculum

Duchek, J. M., Balota, D. A., & Ferraro, F. R. (1994). Component analysis of rhythmic finger tapping task in individuals with senile dementia of the Alzheimer type and in individuals with Parkinson's disease. *Neuropsychology, 8*(2), 218-226. doi:10.1037/0894-4105.8.2.218

Feil, N. & de Klerk-Rubin, V. (2012). Setting up validation groups. In *The validation breakthrough: Simple techniques for communicating with people with Alzheimer's and other dementias* (pp. 215-240). Baltimore, MD: Health Professions Press.

Friedman, R. L. (2000). *The healing power of the drum*. Gilsum, NH: White Cliffs Media.

Fujimoto, H. (2011). Suggested long-term music therapy for older adults with dementia. *Music Therapy Today, 9*(1), 31. Retrieved from http://musictherapytoday.wfmt.info/Music_Therapy_Today/2011Special_Issue.html

Geyer, R. L. (2008). *The impact of live religious music versus live secular music on pre-wandering behaviors of persons diagnosed with dementia of the Alzheimer's type* (Master's degree, Ohio University). Retrieved from http://rave.ohiolink.edu/etdc/view?acc_num=ohiou1217569051

Gildar, L. S. (2010). *The impact of high dosage music therapy on the facilitation of language functioning improvements in a patient with dementia: A case study* (Unpublished master's thesis). Drexel University, Philadelphia, PA.

Gold, K. (2014). But does it do any good? Measuring the impact of music therapy on people with advanced dementia: (Innovative practice). *Dementia, 13*(2), 258-264. doi:10.1177/1471301213494512

Götell, E. (2003). Singing, background music and music-events in the communication between persons with dementia and their caregivers (Master's thesis, Blekinge Institute of Technology, Karlskrona, Sweden). Retreived from http://hdl.handle.net/10616/39949

Götell, E., Brown, S., & Ekman, S.-L. (2000). Caregiver-assisted music events in psychogeriatric care. *Journal of Psychiatric and Mental Health Nursing, 7*(2), 119-125. doi:10.1046/j.1365-2850.2000.00271.x

Götell, E., Thunborg, C., Söderlund, A., & Heideken Wågert, P. (2012). Can caregiver singing improve person transfer situations in dementia care? *Music and Medicine, 4*(4), 237-244. doi:10.1177/1943862112457947

Groene, R. (2001). The effect of presentation and accompaniment styles on attentional and responsive behaviours of participants with dementia diagnoses. *Journal of Music Therapy, 38*(1), 36-50. doi:10.1093/jmt/38.1.36

Hanson, N., Gfeller, K., Woodworth, G., Swanson, E. A., & Garand, L. (1996). A comparison of the effectiveness of differing types and difficulty of music activities in programming for

older adults with Alzheimer's disease and related disorders. *Journal of Music Therapy, 33*(2), 93-123. doi: 10.1093/jmt/33.2.93

Hanson-Abromeit, D. & Moore, K. S. (2014). The systematic review as a research process in music therapy. *Journal of Music Therapy, 51*(1), 4-38. doi:10.1093/jmt/thu002

Hara, M. (2011). Expanding a care network for people with dementia and their carers through musicking: Participant observation with "Singing for the Brain". *Voices: A World Forum for Music Therapy, 11*(2). Retrieved from https://voices.no/index.php/voices/article/viewArticle/570

Hiller, J. (2009). Use of and instruction in clinical improvisation. *Music Therapy Perspectives, 27*(1), 25-32. doi:10.1093/mtp/27.1.25

Intveen, A. (2007). Musical instruments in anthroposophical music therapy with reference to Rudolf Steiner's model of the threefold human being. *Voices: A World Forum for Music Therapy, 7*(3). Retrieved from https://voices.no/index.php/voices/article/view/547/408

Johnson, R. & Taylor, C. (2011). Can playing pre-recorded music at mealtimes reduce the symptoms of agitation for people with dementia? *International Journal of Therapy and Rehabilitation, 18*(12), 700-710. doi:10.12968/ijtr.2011.18.12.700

Jonas-Simpson, C. & Mitchell, G. (2005). Giving voice to expressions of quality of life for persons living with dementia through story, music, and art. *Alzheimer's Care Quarterly, 6*(1), 52-61.

Justus, K. M. (2014). *Music, dementia, and the reality of being yourself* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (Accession Order No. 3638015)

Karkou, V. & Meekums, B. (2014). Dance movement therapy for dementia. *Cochrane Database of Systematic Reviews 2014*, Issue 3. Art. No.: CD011022. doi:10.1002/14651858.CD011022

Khoo, Y. J., van Schaik, P., & McKenna, J. (2014). The Happy Antics programme: Holistic exercise for people with dementia. *Journal of Bodywork and Movement Therapies, 18*(4), 553-558. doi:10.1016/j.jbmt.2014.02.008

Ki, C. S. (2012). *The effects of the music-with-movement intervention on the cognitive functions of people with moderate dementia* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (Accession Order No. 3574109)

Kirkland, K., Fortuna, M. C., Kelson, E., & Phinney, A. (2014). Music therapy and spiritual care for persons with dementia: A mixed-methods study. *Canadian Journal of Music Therapy, 20*(1), 10-37.

Klages, K., Zecevic, A., Orange, J. B., & Hobson, S. (2011). Potential of Snoezelen room multisensory stimulation to improve balance in individuals with dementia: a feasibility randomized controlled trial. *Clinical Rehabilitation, 25*(7), 607-616. doi:10.1177/0269215510394221

Kumar, P., Das, P. C., Chatterjee, P., & Dey, A. B. (2012). A novel occupational therapy strategy for cognitive impairment in old age. *Journal of the Indian Academy of Geriatrics, 8*(3), 120-123.

Lecourt, E. & Fertier, A. (2012). Culture and Alzheimer: Programme Alzheimer, Culture et Thérapie (PACT): Modes for assessing and fostering the ability to take part in cultural activities. In G. R. Hayes & M. H. Bryant (Eds.), *Psychology of culture: Psychology of emotions, motivations and actions* (pp. 69-86). New York, NY: Nova Science.

Ledger, A. J. & Baker, F. A. (2007). An investigation of long-term effects of group music therapy on agitation levels of people with Alzheimer's disease. *Aging & Mental Health, 11*(3), 330-338. doi:10.1080/13607860600963406

Lin, Y., Chu, H., Yang, C.-Y., Chen, C.-H., Chen, S.-G., Chang, G.-J., … Chou, K.-R. (2011). Effectiveness of group music intervention against agitated behavior in elderly persons with dementia. *International Journal of Geriatric Psychiatry, 26*(7), 670-678. doi:10.1002/gps.2580

Lipe, A. (1995). The use of music performance tasks in the assessment of cognitive functioning among older adults with dementia. *Journal of Music Therapy, 32*(3), 137-151. doi:10.1093/jmt/32.3.137

Lipe, A. W., York, E., & Jensen, E. (2007). Construct validation of two music-based assessments for people with dementia. *Journal of Music Therapy, 44*, 369-387. doi:10.1093/jmt/44.4.369

Lum, C.-H. (2011). Reflective dialogues in community music engagement: An exploratory experience in a Singapore nursing home and day-care centre for senior citizens. *International Journal of Community Music, 4*(2), 185-197. doi:10.1386/ijcm.4.2.185_1

Mahoney, A. E. J. (2003). Age- or stage-appropriate? Recreation and the relevance of Piaget's theory in dementia care. *American Journal of Alzheimer's Disease and Other Dementias, 18*(1), 24-30. doi:10.1177/153331750301800102

Marmstål Hammar, L. (2013). Can humming caregivers' facilitate feeding during mealtime situations with persons with dementia? A qualitative study. *Non-pharmacological Therapies in Dementia, 3*(1), 11-22.

Marmstål Hammar, L., Emami, A., Engström, G., & Götell, E. (2010). Reactions of persons with dementia to caregivers singing in morning care situations. *The Open Nursing Journal, 4*, 35-41. doi:10.2174/1874434601004010035

Martin, G. A., Mockbee, D., Alonzo, T., Deyo, K., Dougherty, J., & Horton, A. (2011). Activities programming. In G. A. Martin & M. N. Sabbagh (Eds.), *Palliative care for advanced Alzheimer's and dementia: Guidelines and standards for evidence-based care* (pp. 155-170). New York, NY: Springer.

Matney, B. (2004a). *Percussion in music therapy: An instructional manual based on analysis of the related literature* (Master's thesis). Retrieved from ProQuest Theses and Dissertations. (Accession Order No. 1423138)

Matney, B. (2004b). *Tataku: The use of percussion in music therapy.* Denton, TX: Sarsen.

Matney, B. (2015). The use of percussion in therapy: A content analysis of the literature. *Nordic Journal of Music Therapy,* 1-32. doi:10.1080/08098131.2015.1084027

McHugh, L., Gardstrom, S., Hiller, J., Brewer, M., & Diestelkamp, W. S. (2012). The effect of pre-meal, vocal re-creative music therapy on nutritional intake of residents with Alzheimer's disease and related dementias: A pilot study. *Music Therapy Perspectives, 30*(1), 32-42. doi: 10.1093/mtp/30.1.32

Melhuish, R. (2013). Group music therapy on a dementia assessment ward: An approach to evaluation. *Canadian Journal of Music Therapy, 27*(1), 16-31.

Mercadal-Brotons, M. (2011). Music therapy and dementia: A cognitive-behavioral approach. In A. Meadows (Ed.), *Developments in music therapy practice: Case study perspectives* (pp. 542-555). Gilsum, NH: Barcelona.

Musical Instrument Museums Online (2011, July 8). *Revision of the Hornbostel-Sachs classification of musical instruments by the MIMO Consortium.* Retrieved from http://www.mimo-international.com/documents/Hornbostel%20Sachs.pdf

Montagu, J. (2011). Percussion instruments. In A. Latham (Ed.), *The Oxford Companion to Music*. doi:10.1093/acref/9780199579037.001.0001

Nashimoto, M., Onchi, Y., & Maruyama, K. (2007). An approach to introducing music therapy to the elderly with dementia in small-scale, multi-functional facilities: Aiming to practice empowerment. *The Niigata Journal of Health and Welfare, 7*(1), 38-42.

Nugent, N. (2003). Processes in group music therapy: Reducing agitation in individuals with Alzheimer's disease and related disorders. *New Zealand Journal of Music Therapy,* 60-81.

Olderog Millard, K. A., & Smith, J. M. (1989). The influence of group singing therapy on the behaviour of Alzheimer's disease patients. *Journal of Music Therapy, 26*(2), 58-70. doi:10.1093/jmt/26.2.58

Osman, S. E., Tischler, V., & Schneider, J. (2014). 'Singing for the Brain': A qualitative study exploring the health and well-being benefits of singing for people with dementia and their carers. *Dementia, 0*(0), 1-14. doi:10.1177/1471301214556291

Palo-Bengtsson, L. & Ekman, S.-L. (2002). Emotional response to social dancing and walks in persons with dementia. *American Journal of Alzheimer's Disease and Other Dementias, 17*(3), 149-153. doi:10.1177/153331750201700308

Palo-Bengtsson, L., Winblad, B., & Ekman, S.-L. (1998). Social dancing: A way to support intellectual, emotional and motor functions in persons with dementia. *Journal of Psychiatric and Mental Health Nursing, 5*(6)*,* 545-554. doi:10.1046/j.1365-2850.1998.560545.x

Politis, A. M., Vozzella, S., Mayer, L. S., Onyike, C. U., Baker, A. S., & Lyketsos, C. G. (2004). A randomized, controlled, clinical trial of activity therapy for apathy in patients with dementia residing in long-term care. *International Journal of Geriatric Psychiatry, 19*(11), 1087-1094. doi:10.1002/gps.1215

Prince, M., Bryce, R., Albanese, E., Wimo, A., Ribeiro, W., & Ferri, C. P. (2013). The global prevalence of dementia: A systematic review and metaanalysis. *Alzheimer's & Dementia, 9*(1)*,* 63-75. doi:10.1016/j.jalz.2012.11.007

Quinn, L. A. (2011). *The accumulative effects of music therapy on dementia-related speech deficits in a sub-acute hospital setting* (Doctoral dissertation, University of Melbourne, Victoria, Australia). Retrieved from http://hdl.handle.net/11343/37122

Raglio, A., Bellelli, G., Mazzola, P., Bellandi, D., Giovagnoli, A. R., Farina, E. … Trabucchi, M. (2012). Music, music therapy and dementia: A review of literature and the recommendations of the Italian Psychogeriatric Association. *Maturitas, 72*(4), 305-310. doi:10.1016/j.maturitas.2012.05.016

Raglio, A., Bellelli, G., Traficante, D., Gianotti, M., Ubezio, M. C., Villani, D., & Trabucchi, M. (2013, March 8). *Efficacy of Music Therapy in the Treatment of Behavioral and Psychiatric Symptoms of Dementia*. Retrieved from http://azmta.org/2013/03/08/efficacy-of-music-therapy-in-the-treatment-of-behavioral-and-psychiatric-symptoms-of-dementia/

Ragneskog, H. & Kihlgren, M. (1997). Music and other strategies to improve the care of agitated patients with dementia. *Scandinavian Journal of Caring Sciences, 11*(3), 176-182. doi:10.1111/j.1471-6712.1997.tb00451.x

Ragni, A. S., Fiandra, A., Tognetti, L., & Bartorelli, I. P. (2005). Music therapy with demencia: A resource for reactivation. *Music Therapy Today, 6*(4), 1308-1323.

Reuer, B., Crowe, B., & Bernstein, B. (2007). Group rhythm and drumming with older adults: Music therapy techniques and multimedia training guide. Silver Spring, MD: American Music Therapy Association.

Ridder, H. M. O. (2003). Singing dialogue: Music therapy with persons in advanced stages of dementia: A case study research design (Doctoral dissertation, Aalborg University, Aalborg, Denmark). Retrieved from http://vbn.aau.dk/files/195252076/ridder_2003.pdf

Ridder, H. M. (2005). An overview of therapeutic initiatives when working with people suffering from dementia. In D. Aldridge (Ed.), *Music therapy and neurological rehabilitation: Performing health* (pp. 61-82). Philadelphia, PA: Jessica Kingsley.

Ridder, H. M. & Aldridge, D. (2005). Individual music therapy with persons with frontotemporal dementia. *Nordic Journal of Music Therapy, 14*(2), 91-106.

Ridder, H. M. & Wheeler, B. L. (2015). Music therapy for older adults. In B. L. Wheeler (Ed.), *Music Therapy Handbook* (pp. 367-378). New York, NY: Guilford.

Rio, R. (2009). *Connecting through music with people with dementia: A guide for caregivers.* London: Jessica Kingsley.

Robb, S. L., Carpenter, J. S., & Burns, D. S. (2010). Reporting guidelines for music-based interventions. *Journal of Health Psychology, 16*(2), 342-352. doi:10.1177/1359105310374781

Robertson-Gillam, K. (2011). Music therapy in dementia care. In H. Lee & T. Adams (Eds.), *Creative approaches in dementia care* (pp. 91-109). Basingstoke, Hampshire: Palgrave Macmillan.

Sakamoto, M., Ando, H., & Tsutou, A. (2013). Comparing the effects of different individualized music interventions for elderly individuals with severe dementia. *International Psychogeriatrics, 25*(5), 775-784. doi:10.1017/S1041610212002256

Samson, S., Clément, S., Narme, P., Schiaratura, L., & Ehrlé, N. (2015). Efficacy of musical interventions in dementia: Methodological requirements of nonpharmacological trials. *Annals of the New York Academy of Sciences, 1337*, 249-255. doi:10.1111/nyas.12621

Schindel Martin, L., McDowell, S., O'Leary, J., Hagens, C., Bonas, B., Waxman, S., … Rozon, L. (2004). An observational study of the impact of vibrotactile rhythm playing on seniors in long term care. *Activities, Adaptation & Aging, 28*(2), 57-71. doi:10.1300/J016v28n02_04

Smith, B. B. (2010). Treatment of dementia through cultural arts. *Care Management Journals, 11*(1), 42-47.

Snyder, A. (2012). *Music therapy and quality of life: The effects of musical interventions on self-reported and caregiver-reported quality of life in older adults with symptoms of dementia* (Master's thesis, Western Michigan University). Retrieved from http://scholarworks.wmich.edu/masters_theses/109

Sung, H., Chang, S., Lee, W., & Lee, M. (2006). The effects of group music with movement intervention on agitated behaviours of institutionalized elders with dementia in Taiwan. *Complementary Therapies in Medicine, 14*(2)*,* 113-119. doi:10.1016/j.ctim.2006.03.002

Sung, H., Lee, W., Li, T., & Watson, R. (2012). A group music intervention using percussion instruments with familiar music to reduce anxiety and agitation of institutionalized older adults with dementia. *International Journal of Geriatric Psychiatry, 27*(6), 621-627. doi:10.1002/gps.2761

Suzuki, M., Kanamori, M., Watanabe, M., Nagasawa, S., Kojima, E., Ooshiro, H., & Nakahara, D. (2004). Behavioral and endocrinological evaluation of music therapy for elderly patients with dementia. *Nursing and Health Sciences, 6*(1), 11-18. doi:10.1111/j.1442-2018.2003.00168.x

Svansdottir, H. B., & Snaedal, J. (2006). Music therapy in moderate and severe dementia of Alzheimer's type: A case-control study. *International Psychogeriatrics, 18*(4), 613-621. doi:10.1017/S1041610206003206

Tomaino, C. M. (2013). Meeting the complex needs of individuals with dementia through music therapy. *Music and Medicine, 5*(4), 234-241. doi:10.1177/1943862113505775

Tuckett, A. G., Hodgkinson, B., Rouillon, L., Balil-Lozoya, T., & Parker, D. (2014). What carers and family said about music therapy on behaviours of older people with dementia in residential aged care. *International Journal of Older People Nursing, 10*(2), 146-157. doi:10.1111/opn.12071

Tung, Y. C. S. (2014). *Supporting family caregivers in end-of-life care: A systematic literature review of music therapy resources 1990 to 2012* (Master's thesis, Concordia University, Montreal, QC). Retrieved from http://spectrum.library.concordia.ca/978421/

Tyrrell, J., Genin, N., & Myslinski, M. (2006). Freedom of choice and decision-making in health and social care: Views of older patients with early-stage dementia and their carers. *Dementia, 5*(4), 479-502. doi:10.1177/1471301206069915

van Bruggen-Rufi, M. & Vink, A (2013). Home is where the heart is. In A. Meadows (Ed.), *Developments in Music Therapy Practice: Case study perspectives* (pp. 569-581). Gilsum, NH: Barcelona.

van der Vleuten, M., Visser, A., & Meeuwesen, L. (2012). The contribution of intimate live music performances to the quality of life for persons with dementia. *Patient Education and Counseling, 89*(3), 484-488. doi:10.1016/j.pec.2012.05.012

Van de Winckel, A., Feys, H., De Weerdt, W., & Dom, R. (2004). Cognitive and behavioural effects of music-based exercises in patients with dementia. *Clinical Rehabilitation, 18*(3), 253-260. doi: 10.1191/0269215504cr750oa

VanWeelden, K. & Cevasco, A. M. (2007). Repertoire recommendations by music therapists for geriatric clients during singing activities. *Music Therapy Perspectives, 25*(1), 4-12. doi: 10.1093/mtp/25.1.4

Wigram, T. (2004). *Improvisation: Methods and techniques for music therapy clinicians, educators and students.* Philadelphia, PA: Jessica Kingsley.

Wong, G. H. Y., Ng, C. K. M., Lai, C. K. Y., Lee, M. N. Y., Lum, T. Y. S., Jiang, N., … Dai, D. L. K. (2014). Development of six arts, a culturally appropriate multimodal

nonpharmacological intervention in dementia. *The Gerontologist,* 1-10. doi: 10.1093/geront/gnu102

World Federation of Music Therapy. (2011). *About WFMT.* Retrieved from http://www.musictherapyworld.net/WFMT/About_WFMT.html

Wu, E., Barnes, D. E., Ackerman, S. L., Lee, J., Chesney, M., & Mehling, W. E. (2015). Preventing loss of independence through exercise (PLIÉ): Qualitative analysis of a clinical trial in older adults with dementia. *Aging & Mental Health, 19*(4), 353-362. doi:10.1080/13607863.2014.935290

Yaffe, K., Fox, P., Newcomer, R., Sands, L., Lindquist, K., Dane, K., & Covinsky, K. E. (2002). Patient and caregiver characteristics and nursing home placement in patients with dementia. *Journal of the American Medical Association, 287*(16), 2090-2097. doi:10.1001/jama.287.16.2090

York, E. (1994). The development of a quantitative music skills test for patients with Alzheimer's disease. *Journal of Music Therapy, 31*(4), 280-296. doi:10.1093/jmt/31.4.280

Young, L. (2013). Persons with Alzheimer's and other dementias. In L. Eyre (Ed.), *Guidelines for music therapy practice in mental health.* Gilsum, NH: Barcelona.

Appendix A

Goals Created for the Use of Percussion by Frequency of Mention

Cognitive domain		40
Engagement	8	
Memory/Reminiscing	6	
Attention	5	
Creativity	4	
Orientation	3	
Awareness	3	
Response	3	
Task performance	2	
Global cognitive functions	1	
Sense of coherence	1	
Make choices	1	
Sequencing	1	
Problem solving	1	
Self-regulation	1	
Social domain		33
Social interaction	16	
Participation	6	
Behavior	5	
Connection	4	
Feelings of community	2	
Physical domain		27
Sensory stimulation	6	
Movement	3	
Fine motor	3	
Gross motor	2	
Stimulation	2	
Flexibility	2	
Relaxation	2	
Functional skills	1	
Energy	1	
Mobility	1	
Range of motion	1	
Endurance	1	
Strength	1	
Reliance on prescription drugs	1	
Psychological domain		23
Self-expression	8	
Sense of self	6	

Self-esteem	4		
Self-confidence	2		
Validate experiences	1		
Feelings of control	1		
Perceived pain	1		
Emotional domain		20	
Mood	6		
Agitation	5		
Anxiety	3		
Depression	2		
Affect	2		
Grief	1		
Safety	1		
Communication domain			13
Unspecified	7		
Expressive language	4		
Meaningful communication	1		
Non-verbal communication	1		
Musical domain			6
Musical dialogue	2		
Aesthetic experience	1		
Musical expression	1		
Experience a different instrument	1		
Musical relationship	1		
Quality of life domain		5	
Overall	4		
Slowdown loss of functions	1		
Assessment		4	
Unspecified	1		
Cognitive	1		
Music	1		
Communication	1		
Cultural domain			3
Cultural expression	1		
Cultural and national identity	1		
Cultural needs	1		
Spiritual domain			1
Spiritual expression	1		

Appendix B

Descriptive Results from Sessions that Used Percussion Instruments

Asklakson, 2010	• Decrease in agitation • Higher scores in engagement and social interaction • No difference in task performance or problem solving
Barwick, 2014	• Increase in alertness (sleep active or actively alert states); awareness of environment and topic • Response with varying levels of physical and communicative abilities • Expressive language and non-verbal communication; expressed affect • Purposeful movement; relaxation • Social interaction and connection with music therapist
Cevasco, 2010	• Greatest on-task participation and positive affect when therapist used affect and proximity • Greatest on-task participation (73%) for rhythm experiences • Lowest amount of positive affect for rhythm experience 39% (compared to singing 46% and movement 47%)
Cevasco & Grant, 2006	• Highest rhythmic accuracy with rhythms presented on djembe, followed by paddle drum, maraca, and claves • Highest rhythmic accuracy for eight eighth notes, followed by four quarter notes, then two eighths followed by a quarter; lowest rhythmic accuracy was half note followed by two quarters • Significant difference between types of rhythms used and types of instruments used
Collier, 2007	• Significant main effect on function (motor and process skills) and mood and behavior • Significant improvement in motor performance • Participants within the low registration quadrant of the Adult Sensory Profile improved significantly in function
Coury, 2013	• Engagement through playing instrument according to function, entrainment, vocalizing a chant, and eye contact
Geyer, 2008	• Reduced wandering behaviors
Gildar, 2010	• No significant differences in language functioning scores • Improved drumming technique, musical imitation, and musical turn taking across therapy • Improved mood and energy level throughout each session, maintain focus, social interaction, one clear verbal interaction
Gold, 2014	• More positive and fewer negative moods and behaviors on music therapy days
Hara, 2011	• Active participation, quality of life, sense of belonging, learn informally about dementia and dementia caring

Ki, 2012	• Significant difference in memory function (storage and delayed recall) and depressive symptoms • Improvements in global cognition, verbal fluency, anxiety, and agitated behavior • Effects on memory function, anxiety, and agitated behavior effects could last for at least six weeks post-intervention
Lipe, York, & Jenson, 2007	• Strong correlations between Mini-Mental State Exam (MMSE) and Music-Based Evaluation of Cognitive Function (MBECF), MMSE and Residual Music Skills Test RMST), MBECF and RMST
Melhuish, 2013	• Increased well-being; social interaction • Range of engagement scores - sustained and intermittent independent use of instruments and/or interaction with group, brief and intermittent supported exploration of instruments and/or interaction with therapist
Pyykonen, 2013	• Active participation, improved motor skills, creativity, social interaction, built community, self-expression, self-esteem, quality of life
Quinn, 2011	• No significant difference from control group for language functioning scores, Mini-Mental State Examination scores, depression scores, short-term and working memory scores
Ragni, Fiandr, Tognetti, & Bartorelli, 2005	• Significant difference in MMSE values before and after therapy • Significant difference in long- and short-term memory in the sound production phase • No difference in attention
Ridder, Stige, Qvale, & Gold, 2013	• Decrease in agitation, difference in perceived agitation disruptiveness • Less reliance on psychotropic medication during music therapy compared to standard care
Dalby et al., 2005	• Enjoyment, participation, musical expression, social interaction, engagement, improved mood, deal with difficult feelings, feelings of empowerment, enhanced quality of life, develop self-esteem and self-confidence
Snyder, 2012	• No significant different for quality of life scores