1-2015

The Importance of a Creative Dance and Story-Telling Program for Senior Housing Residents

Courtney Holmes
St. Catherine University

The Importance of a Creative Dance and Story-Telling Program for Senior Housing Residents

Courtney Holmes

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Arts in Occupational Therapy.
Saint Catherine University, St. Paul, Minnesota

January 2015

Thesis Advisor: Catherine Sullivan, Ph.D., OTR/L
Thesis Readers: Kristine Haertl, Ph.D., OTR/L, FAOTA and Maria Genné, M.Ed.

St. Catherine University

Master of Arts in Occupational Therapy

Certification of Successful Thesis Defense

We, the undersigned, certify that

Courtney Holmes

has successfully defended the thesis titled

The Importance of a Creative Dance and Story-Telling Program for Senior Housing Residents

Cathleen Smith Ph.D., OTR/L 2/16/15

Thesis Advisor and Chair of Thesis Committee Date

Ph.D., OTR/L, FAOTA 2-16-2015

Thesis Reader and Member of Thesis Committee Date

Marie DeGenne MEd 2/16/15

Thesis Reader and Member of Thesis Committee Date

Certification of Approval for Final Copy of Thesis

I, the undersigned, approve the final copy of the thesis by

Courtney Holmes

Thesis Advisor and Chair of Thesis Committee Date

Acknowledgements

This thesis is a component of a larger faculty-led project at St. Catherine University involving the Physical and Occupational therapy department in partnership with KairosAlive! Part of the data analyzed in this thesis was collected over a period of 3 years by both physical and occupational therapy faculty and students. Lisa Dutton, Ph.D., PT, also provided guidance for the quantitative analysis of the data.

This study was partially funded by a grant from KairosAlive!, and by Research Assistant Funding provided by the Assistant and Mentorship Program (AMP) at St. Catherine University to support data collection, transcription and analysis, as well as my personal and professional development through the mentorship opportunity.

I would first like to acknowledge the individuals of Kairos Dance Theatre for their willingness to have research conducted on their Dancing Heart™ program on the effects of art-based programming on older adults. Their contagious love for what they do is truly inspiring. I'm also grateful to the elder participants who volunteered their time and insights to this study. I would like to acknowledge and thank my thesis adviser, Catherine Sullivan, for her continuous guidance and support. Catherine has been an excellent mentor for me and I am forever grateful for her advice, direction, and encouragement. Many thanks as well to Kristine Haertl and Maria Genné for their supportive and constructive feedback as thesis readers. Additionally, I would like to thank my fellow student researcher, Therese Wengler, for being so supportive, helpful, and wonderful. Finally, I would like to acknowledge my parents, Dan and Kaylynn, my brother, Tyler, and my friends for all their love, unconditional support, and belief in me to seeing this project to a completion.

Table of Contents

Abstract

The purpose of this study, conducted in collaboration with Kairos Alive! was to explore the importance of a creative arts dance and story-telling program for older adults living in senior congregate living facilities. This mixed-method study used a baseline-controlled semi-experimental design over a period of three months. The research questions were: (a) What is the experience of reminiscence and new memories in the arts-based program? and (b) What is the impact of the program on perceived overall quality of life? Quantitative tools included the *Montreal Cognitive Assessment* (*MoCA*) and the *SF-36* (*physical and mental*). Qualitative data was collected through semi-structured interviews. Out of the 34 participants tested at baseline, 14 completed the study and met the participation criterion for analysis. Descriptive statistics show that participants' *MoCA* scores were suggestive of mild cognitive impairment (MCI). Repeated-measures ANOVA revealed a significant improvement in memory scores (*MoCA*) following intervention, although the scores were still in the MCI range. Scores on the *SF-36* did not result in clear improvements compared to baseline. The positive findings on memory show that a weekly arts-based program could improve memory in older adults who had scores suggestive of MCI. Qualitative results show that the program stimulated reminiscence and new memories, enhanced quality of life as well as fostered a feeling of community among residents.

Introduction

The purpose of this interdisciplinary research was to determine the importance of a creative arts dance program to the quality of life of older adults living in congregate senior housing. The disciplines involved in the research were professional dance, occupational therapy, and physical therapy. The creative arts dance program refers to the *Dancing Heart* program that Kairos Alive! artists created specifically for older adults. This program involves professionals encouraging older adults to engage in dance either through sitting or standing and incorporating miming, storytelling, music, and singing (Kairos Alive!: The Dancing Heart program, n.d). The study described in this thesis is part of a larger mixed-methods research project. The objective of the larger project is to study the experience and impact of arts-based programming for elders in a variety of settings using a number of outcome measures. Findings from the previous studies within this broad project will be further discussed at the end of the literature review. A parallel thesis by Therese Wengler is focusing on the impact of arts-based programming on creativity. The current study's focus is on examining the participants' quality of life, with an emphasis on memory using quantitative and qualitative methodology.

In the overview of the literature, I will first discuss health and quality of life in aging with an emphasis on participation in occupations to provide the foundation for this creative dance study. Information on memory and on the ways it may be impacted in older adults can be found in appendix A. Finally, I will discuss the research on the effects of creative arts programs for older adults in senior congregate living facilities with an emphasis on the impact of memory and other cognitive function.

Health and Quality of Life in Aging

Definition

As longevity increases, people are seeking out ways to increase their quality of life while health care professionals are focusing on promoting healthier aging (Ford et al., 2000; Thompson, Sierpina, & Sierpina, 2002). There are varying definitions and terms related to the concept of healthy aging. It is important to note that healthy aging is not a process that begins in old age, but rather a journey that starts early in life (Barondess, 2008). Healthy aging is a multidimensional term that includes physical, cognitive, and social factors of one's life (Hansen-Kyle, 2005). Bryant, Corbett, & Kutner, (2001) interviewed 22 older adults to find out what healthy aging meant to them and how they would define it; the researchers found the participants felt it meant being able to go out and do something that is meaningful to them.

Successful aging is another term and similarly explains the avoidance of disease and or disability, the maintenance of physical and cognitive abilities, and sustained engagement in social and meaningful activities (Rowe & Kahn, 1997). These varying factors of successful aging are examined from both professional evaluations and individuals' perception of them to ensure that all dimensions are accounted for (Bonder, 2009). Pursuing healthy aging may be more challenging during certain times, or stages, in our lives than others.

Life Stages and Occupations in Aging

There is a heavy focus in healthcare placed on maintaining and preserving the physical health of older adults, but it is also important to acknowledge their mental and emotional health as they are transitioning into their final life stages. Erik Erikson described eight developmental tasks of the lifespan, with *integrity versus despair* as the final stage that older adults go through (Erikson, 1959). While Erikson's psychosocial theory characterized the opposite of integrity in late life as despair, Adams, Roberts, and Cole, (2011) described in modern terms, the opposite of successful aging as late life depression. These authors highlight how older persons' social and activity preferences likely influence late life depression, which is the most common mental health problem in older adults (Adams, Roberts, & Cole, 2011). Viewing aging beyond a strict physical model is important as an aging person experiences psychosocial changes along with the physical ones (Johansson, 2002).

Life transitions can be healthy or unhealthy depending on the effectiveness of coping strategies (Adams, Roberts, & Cole, 2011; Nilsson, Sarvimäki, & Ekman, 2000; Osborne, 2009). Knowledge about transition processes and of the older adults' valued roles are important to help prevent unhealthy transitions (Johansson, 2002). Retirement is a life transition that can bring on new roles, routines, and sometimes even a new sense of identity for an older adult (Osborne, 2009). After older adults decide to retire, they often find themselves with more free time for leisure activities and have the opportunity to engage in various artistic occupations (Osborne, 2009). Researchers have found that engagement in meaningful occupations and maintenance of valued roles are critical for

maintaining a positive identity and transition well into retirement (Pepin & Deutscher, 2011).

Retirees typically find themselves having more free time than they are accustomed to and thus have an opportunity to explore new and meaningful occupations, but they sometimes may experience a decreased involvement in activities. Adults over the age of 75 typically participate in fewer activities than younger people (Adams, Roberts, & Cole, 2011; Jorm et al., 2003). In the absence of employment, older adults may run the risk of becoming more sedentary and less engaged in cognitive stimulating activities (Osborne, 2009; Pepin & Deutscher, 2011). However, fewer occupations may not necessarily be detrimental for older adults as their occupations may become more meaningful.

The Activity Theory of aging proposes that more activity leads to greater life satisfaction (Havighurst, 1963). Occupations that have meaning and give a sense of purpose in later life are important and closely related to successful aging (Knight & Ricciardelli, 2003; Vaillant, 2002; Vaillant, DiRago, & Mukamal, 2006). A study done by Adams, Roberts, and Cole (2011) showed that activity preferences in older adults ages 64-89 differed from those in older adults 90 years and older. The study found that older adults 90 years and older tended to disengage from larger social groups to pursue more spiritually meaningful occupations (Adams, Roberts, & Cole, 2011). This study illustrates that the very old have different interests and that meaningful occupations do not necessarily involve social interactions. The authors suggest that the very old are more spiritually oriented and that the *The Activity Theory* should not lead to the same expectations for every age group. This view is compatible with *The Gerotranscendence Theory* which describes how the very old redefine their perception of life and death

(Jonson & Magnusson, 2001). In this view, older adults experience a decrease in self-centeredness and material things and spend more time with spiritual activities (Jonson & Magnusson, 2001). Regardless of the type of activity, research shows a clear link between occupational participation and health in older adults.

Occupational Participation and Healthy Aging

It is known that the body's processes slow down as we age making the body more susceptible to various age-related physical and mental impairments. In addition, age-related clinical conditions can influence the physical and mental health of older adults. Older adults can more easily overcome these challenges with adaptations and resources to help continued engagement in meaningful occupations (Wrosch, Dunne, Scheier, & Schulz, 2006). The U.S Centers for Disease Control and Prevention (CDC) identifies key strategies towards healthy aging such as increasing healthy behaviors including immunizations and preventive screens, reducing factors that lead to injury and disability, and assisting older adults with chronic condition management (Lang, Moore, Harris, & Anderson, 2005).

An increasing number of older adults are living longer which results in more cases of multimorbidity and so the benefits that health promotion can bring to the older population are very relevant. It has been found that multimorbidity and many common clinical conditions can impair cognition in older adults (Aarts et al., 2011). Engagement in physical exercise is good for the brain as it has been found to decrease one's chances for neurodegenerative disorders such as dementia (Kronenberg et al., 2006; Muscari et al., 2010). Nutrition and physical activity impact physical and mental functioning in older adults which then impacts their independence levels, self-esteem, and overall

quality of life (Wahlqvist & Savige, 2000). Health promotion strategies are important determinants of healthy aging, but other factors influence it as well.

Active social engagement to the extent desired also promotes emotional and mental well-being. Social occupations have been found to decrease the risk for dementia and to slow motor decline while increasing engagement in cognitive activities (Buchman et al., 2009). Although loneliness is not the largest risk factor for dementia, it does increase one's risk for cognitive disorders (Wilson et al., 2007). Promotion of social engagement in community dwelling seniors is important for the prevention of disabilities (Mendes de Leon, Glass, & Berkman, 2003).

Staying engaged in meaningful occupations plays a significant role in promoting older adults' physical, mental, and emotional well-being. Many studies have found that engaging in meaningful occupations increases health and well-being across the life span. A literature review done by Gutman and Schindler (2007) found that purposeful and meaningful occupations could counter the effects of stress-related diseases and reduce the risk for developing dementia. They found that occupations such as, music, drawing, meditation, reading, arts and crafts, and home repairs can enhance health and well-being through activating the brain's reward system, promoting the relaxation response, and preserving cognitive function into old age (Gutman & Schindler, 2007). This positive impact of active leisure activities, including artistic pursuits on memory and cognition, is important to keep in mind when designing health promotion programs aimed at slowing down or preventing dementia. Benefits of arts-based intervention programs will be discussed further later. Not everyone experiences meaningful occupational participation

in aging, and it is important to be made aware some of the factors that may hinder older adults' involvement in activities.

Barriers to occupational participation in aging. Physical limitations may be the first thing that comes to mind when addressing why someone may not be able to participate in the occupations that he or she enjoys. Risk factors such as smoking, obesity, and sedentary lifestyles lead to a variety of physical ailments that would make certain occupations challenging, especially in the older adult population (Barondess, 2008). Some aging adults are also at risk for sedentary lifestyles secondary to emotional or cognitive limitations (Wahlqvist & Savige, 2000). Those older adults may not engage in occupations that are meaningful to them because they may not know how to overcome the physical or emotional barriers that they experience.

Factors other than physical or mental abilities contribute to how capable an older adult can engage in occupations. Many homes and communities are not set up to easily promote healthy aging and may thereby limit older adults' ability to successfully engage in their community (Réébola & Sanford, 2011). A study done by Bacsu et al., (2012) found that healthy aging among rural older adults depends not only on access to doctors and health care, but also on factors around housing, transportation, finances, care giving, fall risks, sense of community, and support systems. Health care professionals can help older adults remain in their communities longer by identifying all of these factors and promote their engagement in meaningful occupations, including artistic activities, to reduce stress and slow the rate of cognitive decline while promoting well-being and emotional satisfaction (Bacsu et al., 2012; Gutman & Schindler, 2007; Réébola & Sanford, 2011). To understand the impact that meaningful occupations can have on

dementia, it is important to understand the various components of memory (see appendix A). Participation in meaningful activities has been found to reduce the risk for dementia.

Lifestyle and Dementia Risk

Alzheimer's disease is not simply the inevitable result of the brain aging, as it has been found that remaining physically and mentally active reduces the risk of developing dementia (Breedlove, Watson, & Rosenzweig, 2010; Muscari, 2010; Smyth et al., 2004). It has been discovered through epidemiological evidence that higher IQ, higher education levels, and greater participation in physical and mental stimulating activities lower the risk of developing Alzheimer's (Serra et al., 201; Stern, 2006). Conversely, sedentary activities carry a greater risk of dementia. For example, in a case-controlled study that examined television watching as a risk factor for developing Alzheimer's disease, researchers found that each additional daily hour of middle-aged television viewing increases a person's chance for Alzheimer's disease by 1.3 times (Lindstrom et al., 2005).

Physical activity has been the most commonly studied factor found to be protective of dementia. One study found in 59 healthy but sedentary older adults participating in either an aerobic training group or a non-aerobic control group, that the aerobic group showed significant increases in brain volume while the control group did not (Colcombe et al., 2006). Similarly, a cohort study of 1,740 older adults found that regular exercise delayed the onset of dementia and Alzheimer's disease (Larson et al., 2006). The mechanism by which exercise is believed to be protective of memory loss is that it has been found to increase the release of nerve growth factor in the hippocampus resulting in neuronal growth, thus improving memory (Riley, 2009).

Other lifestyle characteristics have been linked to the likelihood for dementia. For example, in a study that examined the relationship between active leisure activities and the risk of dementia in 469 subjects over 75 year old, investigators found that adults who have the greatest participation in meaningful leisure activities have the lowest risk of dementia as they age (Verghese et al., 2003). Although they found several leisure activities to be protective, when looking at exercise they specifically found that dance was the only physical activity, from their study, which independently resulted in lowered incidence of dementia (Verghese et al., 2003).

There is mounting evidence that active leisure activities in aging also improve various cognitive functions. Several studies have found that older adults who engage in mentally stimulating activities such as reading, doing puzzles, or playing cards, on a regular basis experience slower rates of cognitive decline (La Rue, 2010). Overall, it has been found that lifestyles that combine physically and mentally stimulating activities along with social interaction provide the best chance at preserving cognitive function in old age (La Rue, 2010). The descriptive studies summarized above on the association between lifestyle and dementia risk are important but causality can be more strongly established by looking at the effectiveness of interventions.

Intervention Programs

Efforts are being placed on finding low cost intervention programs that support and maintain the health of the elders in our communities. Due to the topic of the research conducted here, the interventions reviewed will focus on cognition and on the benefits of artistic interventions.

Intervention Programs Enhancing Memory

The cognitive declines that older adults experience can impair their daily functioning in areas such as driving, managing finances, food preparation, shopping, and other daily tasks (McGuire, Ford, & Ajani, 2006). Consequently, researchers have explored interventions for improving and maintaining one's cognitive abilities to promote successful aging and autonomy (Vance, Keltner, McGuinness, Umlauf, & Yuan, 2010). Cognitive remediation therapies have been recently developed as low-cost and practical ways to improve mental functioning in older adults (Vance, Heaton, Fazeli, & Ackerman, 2010).

Intervention programs are designed to either focus on a specific cognitive domain, for example memory, or to improve overall cognitive functioning, known as a *global cognitive training protocol* (Ball et al., 2002; Vance, Keltner, McGuinness, Umlauf, & Yuan, 2010). One example of the former is from a large-scale, longitudinal randomized control trial that was conducted to determine if cognitive training interventions of the Advanced Cognitive Training for Independent and Vital Elderly (ACTIVE) program affected cognitive based measures of daily functioning in the older adult participants (Jobe et al., 2001). ACTIVE exercises included problems that targeted improvement of memory, reasoning, and speed of information processing (Jobe et al., 2001). A five year follow up on this study showed that although the speed of processing training and the memory training did not significantly impact on general instrumental activities of daily living (IADLs), the reasoning training did have a positive effect on IADLs. Furthermore, each intervention resulted in positive outcomes on participants' respective cognitive abilities, an effect that was maintained for five years (Willis et al., 2006). This

ACTIVE study suggests that engaging in cognitive exercises results in enduring improvements of various cognitive instrumental abilities in older adults.

While the researchers in the ACTIVE study taught specific cognitive skills, other intervention studies involve the teaching of cognitive strategies. A study by McDougall (2000) examined the effects of a cognitive enhancement program aimed at improving everyday memory, memory self-efficacy, and metamemory in 19 older adults. This particular cognitive program taught the participants skills such as mnemonic techniques, organization, visual imaging skills, concentration/relaxation, and health promotion with feedback and verbal persuasion throughout the program, along with homework and opportunity to practice in group settings (McDougall, 2000). The results on the post-test show that those strategies resulted in significant improvements in prospective memory, as evidenced by improved ability to remember to complete actions in the future without reminders (McDougall, 2000). Those findings about the positive impact of cognitive training interventions on the older adult population could potentially inform health promotion interventions, including arts-based programs.

Arts-Based Intervention Programs

Programs and interventions have been implemented in communities targeting healthy aging in older adults. Arts-based health promotion programs have gained popularity as they typically aim to foster creativity, while providing physical and cognitive stimulation and building community. Professional artists increasingly apply the therapeutic use of art in community settings to promote health and wellness (Castora-Binkley, Noelker, Prohaska, & Satariano, 2010). Creative expression can promote health by providing the person with a sense of control, as well as mastery of a new or familiar

art form. In addition, it has an influence on the mind and the body through positive feelings and physical and or mental engagement. Finally, it also promotes social engagement, and stimulates brain plasticity through challenging activities and new experiences (Cohen, 2006).

Dance is a popular arts-based intervention which researchers sometimes describe as *dance movement therapy programs (DMT).* DMT can be a form of nonverbal communication or expression with one's body, engaging in rhythmic and coordinating movements in a social setting (Boris, 2001).

Although creative art-based social engagement has been an inherent part of human history and was used as a therapeutic tool by occupational therapists since the inception of the profession, systematic and controlled studies examining therapeutic effects for older adults are relatively recent and limited (Stuckey & Nobel, 2010). Studies on the health benefits of art programs for older adults suggest that participants experience benefits on their physical, emotional/quality of life, and cognitive health (Castora-Binkley, Noelker, Prohaska, & Satariano, 2010; Cohen et al., 2006).

Physical Outcomes

Physical improvements from these interventions are measured in numerous ways. One study found that members of a professionally conducted community-based cultural arts program intervention, a chorale group, reported both an overall higher rating of physical health and increased activity levels compared to the comparison group (Cohen et al., 2006). Additionally, a quasi-experimental study looking at a music exercise group for long-term care residents found that the participants involved in the intervention group improved physical function, specifically joint range and function and balance, more than

the control group and significantly declined ten weeks after the program ceased (Hagen, Armstrong-Esther, & Sandilands, 2003). This particular study is interesting in that after ten weeks, the participants' self-reported benefits from the program significantly declined, suggesting ongoing participation is needed for the benefits to endure. A literature review aimed to identify how music and singing may be used therapeutically in the care of older adults revealed that music and singing interventions did result in improved function, the most common benefits being physical improvements in breathing and coordination (Skingley & Vella-Burrows, 2010).

Dance music therapy (DMT) was found to influence a number of physical functions in its participants. A pilot study evaluating the impact of jazz dance classes on 13 healthy older adults found that the classes improved balance in the participants (Alpert et al., 2009). In a similar randomized controlled trial to determine the effects of a 12 month community-based tango dance program, researchers randomly assigned 62 participants with Parkinson's disease (PD) into the tango intervention group vs. the no intervention control group (Foster, Golden, Duncan, & Earhart, 2013). Participants who engaged in the tango dance program reported a greater increase in participation in complex daily activities than the control group. They also recovered better from the activities lost since the onset of PD, and experienced greater engagement in new activities than the control group (Foster, Golden, Duncan, & Earhart, 2013). Additionally, a qualitative study about the impact of a therapeutic dance movement program found through interview data that the program helped older participants maintain their physical functioning while reducing their fear for falling (Lin, McClear, & Tabourne, 2008). This suggests that interventions such as this one may increase the physical function in persons'

with PD and can be generalized to other participant populations. The benefits of arts-based programming does not stop at physical, many studies found emotional and social benefits as well.

Emotional/ Quality of Life Outcomes

An additional outcome from arts-based interventions includes improvements in emotional well-being in participants. In the same study previously mentioned examining the effects on the chorale group, researchers found the participants reported better overall morale and less loneliness after participating in the intervention (Cohen et al., 2006). A literature review exploring the benefits that music and singing can bring when used as an intervention for older adults found that the most common outcomes included enjoyment and increased social interaction for the participants (Skingley & Vella-Burrows, 2010).

Many studies found that dance music therapy (DMT) interventions improved or impacted the participant's emotional health. A dance movement therapy program was implemented in Maplewood Nursing home in New Hampshire as a complementary therapy and found that its positive effects brightened the emotional outlook of its participants (Hoban, 2000). Another study of older adults who self-reported suffering from stress were randomly assigned to either a wait-listed control group or a dance movement therapy treatment group to determine the effects of dance movement therapy interventions on quality of life (Bräuninger, 2012). Using the *World Health Organization Quality of Life Questionnaire 100* (*WHOQOL-100*) and *Munich Life Dimension List*, the researchers found that dance movement therapy was significantly more effective in improving the quality of life of participants when compared to the control group. This was true for both short-term and long-term outcomes (Bräuninger, 2012). A study of

eight reviews and 18 random controlled trials on the effectiveness of DMT concluded that DMT may be a beneficial intervention to help older adults stay healthy and engaged in their communities while improving their quality of life and could be seen as a relevant add-on therapy for a variety of conditions (Strassel, Cherkin, Steuten, Sherman, & Vrijhoef, 2011). An additional well documented benefit of art-based interventions in older adults is cognitive based improvements.

Cognitive Outcomes

Similar to physical and emotional outcomes, cognitive benefits of art-based interventions can be measured in various ways across studies. A quasi-experimental study looking at long-term care residents participating in a music exercise group, found that they reported higher cognitive functioning on the *Cognitive Assessment Scale* (*CAS*). However, those positive effects did not endure as they were found to significantly decrease ten weeks after the program ceased (Hagen, Armstrong-Esther, & Sandilands, 2003). A literature review exploring the benefits that music and singing can bring when used as an intervention for older adults found that increases in memory and recall abilities, as well as cognitive stimulation were the most common improvement for participants (Skingley & Vella-Burrows, 2010).

Creative arts dance based therapies have revealed a wide array of encouraging results with older adult participants who have dementia. One therapeutic circle dance intervention followed eleven participants with moderate-to-severe dementia and seven family members as a body-oriented psychological intervention. Researchers found that this particular intervention had not only a positive impact on participant's general well-being and mood, but that it also improved concentration and communication with others

(Hamill, Smith, & Röhricht, 2012). In a literature review examining the effects of cultural arts interventions in dementia care, researchers found that pharmacological interventions, with the exception of Donepezil, showed smaller positive benefits than the many psychosocial and music therapies reviewed, and that results are best when the intervention happens in a group setting rather than individually based (de Medeiros & Basting, 2013). As demonstrated in the literature reviewed, arts-based programing can have many positive outcomes on their participants.

Dancing Heart Intervention

As previously mentioned, the current study is a part of a larger mixed-methods research project examining the impact of the *Dancing Heart* arts-based intervention that Kairos Alive! artists created specifically for older adults. Three previous master's theses were written regarding the therapeutic intent of the program (Bruesevitz, 2012) and its impact on participants living in long term care facilities (Rydholm, 2011; Schafer, 2011). The qualitative studies based on the analysis of proxy observations by staff and caregivers revealed that the program positively impacted participants' quality of life, as it facilitated building of new memories, social bonding, and experiences of fun and excitement. The studies also showed that residents displayed physical and cognitive benefits (Rydholm, 2011; Schafer, 2011). The conclusion of those studies highlighted the need to interview participants themselves to achieve a more complete understanding of their experiences.

Literature Review Conclusion

Due to design limitations, many of the studies looking at the benefits of dance therapy could not conclusively establish causality. More well-preformed RCT studies are

needed to determine the real value of dance therapy (Strassel, Cherkin, Steuten, Sherman, & Vrijhoef, 2011). Others argue that a mixed methods approach would better capture the nature of creative arts programs (Lin, McClear, & Tabourne, 2008). The limitations from a literature review on the health benefits of art program participation in older adults include overreliance on descriptive statistics over experimental designs and limited sample size (Castora-Binkley, Noelker, Prohaska, & Satariano, 2010). A mixed method study with a design allowing to evaluate cause-effect relationships while at the same time capturing the subjective experience is what is needed to capture the effectiveness of arts-based programming for older adults.

Methods

Research Design and Questions

This research is a part of a larger mixed methods design study, aimed to explore the experience of a creative dance and story-telling program for older adults living in congregate senior housing. The creative arts based program was implemented by *Kairos Alive!*, a non-profit, intergenerational dance company. The present research was conducted in three independent living facilities. The over-arching research question for the project was: What is the importance of a creative dance and story-telling program for senior housing residents? The questions for this study were: (a) What is the experience of reminiscence and new memories in the arts-based dance program? (b) What is the impact of the program on perceived overall quality of life? Both qualitative and quantitative tools were used with the participants in the dance program to answer these research questions (Creswell & Clark, 2007).

It is important to note that this study was performed in a naturalistic context of the *Dancing Heart* program that was to be implemented at the facilities regardless of the research conducted. The design was a mixed methods, baseline controlled within-subject design (Creswell & Clark, 2007). There was a baseline collection of quantitative data one month prior to the start of the *Dancing Heart* program, then again during the week of the first session to establish a baseline. Attendance was taken at each weekly session during the 12 week program. Following the programs finish, post-test quantitative data was collected from participants who attended at least half (6), of the 12 sessions. Finally,

one-on-one interviews were conducted at the end of the program with participants who, again attended at least half of the sessions.

Program Setting and Description

The creative arts-based program implemented by Kairos Alive! is an award winning program called *The Dancing Heart.* This arts-based program takes place in a variety of settings ranging from long term care to day centers. For this study, the setting was limited to congregate senior housing in an urban setting in a large metropolitan area in the Midwest. One of the residences was a low income subsidized housing and the other residence was a mixed income senior rental apartment. The third setting, a suburban independent living center, included only one participant.

The Dancing Heart's program is aimed to engage older adults in the meaningful activities of creative dance and story-telling. The program's vision is "to use dance and storytelling to create a sense of community and well-being in participants of all ages and walks of life" (Kairos Alive!, n.d). Kairos facilitators aim to promote creativity through a variety of music, dance, improvisation, and by encouraging participants to share their personal stories with the group.

The Kairo's *Dancing Hearts* program took place at the 3 facilities once a week for 90 minutes over a period of 12 weeks. The 3 programs were not concurrent, but happened on successive years at different months during the year. A typical *Dancing Hearts* session includes residents of the facility, 2-4 Kairos staff and/or volunteers who lead the session, a few family members, and occasionally some workers or volunteers of the facility. The group always begins with everyone sitting in a chair around a large circle. Participants are asked to share their name with the whole group to start off every

session while music is playing. The Kairos staff encourages all participants to do both synchronized movements as a group and also improvisation movements, either sitting or standing throughout every session. Kairos facilitators consistently encourage all participants to be involved in reminiscing and sharing their individual stories to be mimed or "danced" to by the rest of the group. Every session ends with all the participants and Kairo's staff joining hands and singing the same song.

Population

Participants in the dance group consisted of a group of residents at the independent living facilities who were interested in attending the sessions. All residents were given an opportunity to participate in Kairos' dance program through the posting of flyers around the facilities and an informational meeting prior to the start of the program. The residents were invited to join the dance program regardless of their functional abilities as the program is designed for individuals at all physical, cognitive, and mental health levels. On average, about fifteen residents attended the program's weekly session. Since all residents were welcome to attend the program as they pleased, some participants who initially started the program dropped out for various reasons while new participants joined the group over the three months that the program was offered.

It is important to note that only a subset of the participants in the dance program participated in the research study due to a number of reasons. Participation in this research study was entirely voluntary and not everyone participating in the dance program were there at the informational session one month before the program started. Inclusion criteria for participation in the research was to be a resident that had participated in the *Dancing Heart* dance program for at least 50% of the program's

sessions and not meet any of the exclusion criteria. Exclusion criteria included any person who does not understand English well enough to give consent or complete the study and any person whose cognitive level prevents them a good understanding of the study and expectations which would prevent them from providing authentic consent.

A total of 34 participants across the three sites gave consent for the research study and were involved in the baseline 1 testing. Following attrition, 29 participants were tested for baseline 2, at the start of the intervention and 19 participants were involved in post-test testing. Of those 19 participants that completed all three testing times, 14 met the inclusion criteria of attendance in at least 50% of the total *Dancing Heart* sessions. Fourteen participants across the three sites agreed to and were interviewed after the 12 week program ended.

Procedure

Prior to the start of the study, the Institutional Review Board (IRB) at Saint Catherine University reviewed and approved the study. Participants were recruited through an informative session, about 4 to 5 weeks prior to the start of the program, where Kairos program staff explained what the program would entail and then researchers explained the need for volunteers to participate in three testing sessions, with an interview as an additional option. Residents who were interested in being a part of the research study met with a researcher one-on-one at that time to go through the consent form (see appendix B). They were given a brief verbal summary of the study and a written explanation of what it would entail, including the financial incentive involved. They were told that if they completed the study until the end they would receive a 15 dollar compensation with an additional five dollars if they participate in an interview. If

the residents signed the consent form, there was an option at the bottom for them to check if they would be willing to possibly be contacted for an interview following the completion of the Kairos dance program. The residents were given the opportunity to ask questions or express concerns prior to signing the consent form. Researchers explained that all information would remain anonymous and confidential and that they had the right to refuse to any questions or tests that they did not wish to participate in at any time during the research. After a resident signed the consent form, the researcher made appointments to visit each of the participants individually for baseline 1 testing, to happen one month prior to the start of the *Dancing Heart* program. Participants were then contacted via phone calls to schedule baseline 2 testing during the week of the first *Dancing Heart* session. After three months of the weekly *Dancing Heart* program, participants who had attended at least 50% of the sessions were contacted for post testing. Following the final testing, they were given a gift certificate to thank them for their participation.

The testing typically took place in the resident's apartment or in a quiet place in the facility. The participants were given the choice of completing the self-rated assessments themselves or having the researcher read the questions out loud to them. All participant information from testing was kept in a secured filing cabinet in the Occupational Therapy Department office.

Tools

To explore each research question, both quantitative and qualitative tools were utilized. To answer the first research question, about the experience of reminiscence and new memories in the arts-based program, the *Montreal Cognitive Assessment* (*MoCA*)

was used to collect quantitative data along with interview questions about reminiscence and new learning. To answer the second research question about the impact of the program on perceived overall quality of life, the *SF-36* survey (mental and physical sub tests) was used to along with more general interview questions about the experience and impact of the program. (See Appendix C for interview questions)

Quantitative. The quantitative tools used to answer this study's research questions were the *Montreal Cognitive Assessment* (*MoCA*) and the *SF-36*. These tests were administered, at baseline 1, baseline 2, and post-test, by trained occupational and physical therapy faculty and students.

The *MoCA* was designed to be a screening tool for mild cognitive impairment. The *MoCA* takes about 10 minutes to administer and assess a variety of cognitive domains: attention and concentration, executive functions, memory, language, visuoconstructional skills, conceptual thinking, calculations, and orientation (Nasreddine et al., 2005). A person can score up to a total of 30 points and a score of 26 or above is considered normal, while below 26 indicates mild cognitive impairment (MCI). Specifically, the score range for MCI is 19-25.2 (Nasreddine et al., 2005)

The *MoCA* has been found to have high test-retest reliability (correlation coefficient = 0.92, $p < .001$) (Nasreddine et al., 2005). It also has been shown to have good internal consistency (Cronbach alpha of .83 on the standardized items) (Nasreddine et al., 2005). The *MoCA's* sensitivity in detecting mild cognitive impairment is 90% (Nasreddine et al., 2005).

The quantitative tool used to assess quality of life, for the second research question, was the *SF-36*. This assessment is a self-report measure that measures eight

multi-item dimensions including: physical functioning, social functioning, role limitations (physical problems), role limitations (emotional problems), mental health, vitality, pain, and general health perception (Brazier et al., 1992). This measure's test-retest validity is excellent and the construct validity is substantial (Cronbach's alpha > .85 and reliability coefficient > .75) (Brazier et al., 1992). It contains two summary measures – a physical health score (*SF-36P*) and a mental health score (*SF-36M*) (Ware & Sherbourne, 1992). Each domain is transformed into a scale from 0 to 100 and a five point change in score represents five percent change in health status (Ware & Sherbourne, 1992). A change in five points or more is considered clinically significant (Ware & Sherbourne, 1992).

Qualitative. A semi-structured interview guide was established by the research team to elicit testimonies regarding the impact of Kairos *Dancing Heart* program on them personally and on their facility as a community. Interviews were conducted individually in a private setting where the participant felt comfortable to speak to the researcher. All initial interviews were conducted face-to-face by a researcher and lasted on average 30 minutes. All follow up interviews were conducted by the faculty advisors over the phone, if clarifications were needed. The interview guide was a starting point and open-ended follow-up questions were utilized to encourage the interviewee to elaborate or clarify particular answers. (See appendix C)

Interviews were recorded with Easy Hi-Q Recorder™ computerized recording system. When transcribing the interviews, the Express Scribe™ program was used to play back the recorded interview and allow for easier verbatim transcription.

Data Analysis

Quantitative. Fourteen participants of the 18 who completed all three testing sessions attended at least half of the Kairos dance program sessions. These 14 participants were included in the quantitative data analysis. The data from the demographic form, *MoCA*, and *SF-36* was entered into a password protected excel spreadsheet by the student researchers.

The Excel spreadsheet with the data from of the 14 participant's was uploaded into SPSS, which was used to compute the descriptive statistics for baseline 1, baseline 2, and post-test scores of the *MoCA* and of the *SF-36* physical and mental sub sets. A one-way repeated measures ANOVA was then run through SPSS to determine if there were significant within-subject differences between baseline 2 and post-test (treatment effect) when compared to baseline 1 vs. baseline 2 (within-subject control).

Qualitative. To analyze the transcribed interviews, researchers used the five steps of the Framework Analysis process (Lacey & Luff, 2001). In the first stage, *Familiarization*, researchers read the transcripts several times to familiarize themselves with the data. Next, in the *Identifying a Thematic Framework* stage, a preliminary coding framework was developed. The codes were determined in part from topics present in the literature and the particular research questions, and in part from the themes that emerged within the interview transcripts. After refinement and modifications made by the student and faculty researchers, the two student researchers independently coded an interview transcript to determine inter-rater reliability (see appendix D). Inter-rater reliability was predetermined to be an 80% agreement of codes between two student researchers who would independently code the same transcript. Upon first trial, less than 80% of the

codes were agreed upon so the codes were then refined. A new transcript was chosen to be independently coded by the two student researchers which yielded an 84% agreement. The two researchers then split the remaining transcripts to each code half.

The next step was *Coding*, this was completed line by line by the student researchers with the use of the coding framework. Coding was followed by the *Charting* stage where textual excerpts were organized into a table corresponding to each code according to the participant. The last stage, *Mapping and Interpretation*, the researchers used the thematic charts to identify themes, patterns, associations, and/or relationships that emerged from the data.

Results

To answer the two research questions the quantitative and qualitative results will be presented separately, following the demographic information. The mixed-methods results will be combined in the discussion.

Quantitative

The 14 participants who attended 50% or more of the Kairo's dance sessions and who were tested at all three testing sessions were included in the quantitative data analysis. The demographic information for these 14 participants can be found in Table 1.

Table 1

Summary of Demographic Information

Characteristic	Site 1 (n = 3)	Site 2 (n = 10)	Site 3 (n = 1)	Total (n = 14)
Native Language				
English	2	10	1	13
Other	1	0	0	1
Education				
High school	1	7	1	9
Some college	2	0	0	2
Bachelor's	0	1	0	1
Other	0	2	0	2
Ethnicity				
African American	1	2	0	3
White	1	8	1	10
Hispanic	1	0	0	1

Descriptive statistics for the *Montreal Cognitive Assessment* (*MoCA*) and *Short Form 36* (*SF-36*) physical and mental scores at baseline 1, baseline 2, and posttest data

were computed through SPSS. The results of the *MoCA* are used to help answer research question 1, regarding the impact the program had on memory. The results of the *SF-36* was used to help answer research question 2 regarding participant's perceived quality of life impacted by the program.

The means and standard are presented in Table 2. A one way repeated-measures analysis of variance (ANOVA) was computed through SPSS. Due to the low number of participants, significance level for rejection of the null hypothesis was set at .1. Results are presented in table 3.

Table 2.

Summary of Descriptive Statistics

Measure	Baseline 1 M (*SD*)	Baseline 2 M (*SD*)	Post-test M (*SD*)
MoCA	23.57 (3.72)	24.00 (3.76)	25.07 (3.87)
SF-36M (mental)	52.05 (12.00)	53.72 (11.00)	54.21 (11.65)
SF-36P (physical)	35.25 (9.98)	39.54 (9.79)	38.49 (9.20)

Note. $N = 14$.

Table 3.

Results of One-Way Analyses, with Pairwise Comparisons for Significant Results

	ANOVA			Post Hoc Analysis		
Measure	F(*df*)	MST*(df)*	MSE (*df)*	Time 1 vs 2	Time 1 vs 3	Time 2 vs 3
MoCA	3.930**(2)	8.357(2)	38.698(13)	.429	1.50**	1.07*
SF-36M	.702(2)	18.015(2)	349.622(13)			
SF-36P	3.934**(2)	70.037(2)	244.507(13)	4.29**	3.24*	-1.057

Note. **p < .05, *p < .1; N = 14.

In partial response to research question 1, quantitative results suggest that the program did have a positive impact on memory. Table 2 shows the mean scores of the *MoCA* at baseline 1, baseline 2, and post-test times. The *MoCA* describes a score of 25 or below to indicate mild cognitive impairment (MCI); therefore, the average scores on all three testing times indicate the participants are living at MCI levels. As illustrated in Table 3, the *MoCA* contrast between baseline testing 1 and 2 is not significant, which is as expected for a baseline. The contrast between baseline testing 1 and the posttest is significant at $p < .05$ which shows that the *MoCA* scores did increase over the course of the study. The contrast between baseline testing 2 and posttest is significant at $p < .1$. These results suggest that the intervention did have an impact on cognition as the scores increased following intervention (from baseline 2 to the final testing) when compared to the baseline prior to treatment (time 1 vs time 2) where there was no increase.

Analysis of the *SF-36*, designed to answer the second research question about quality of life, yielded mixed results. Descriptive statistics show that the means for the *SF-36M* (mental) did change over time, suggesting increases in mood, vitality and other emotional functions over the course of the study. However, the standard deviations were large showing high variability and the ANOVA's main effect for the *SF-36M* was not significant. Therefore follow-up pairwise comparisons were not displayed in Table 3. The means for *SF-36P* (physical), suggests that there was an improvement in physical function between baseline testing 1 and 2 which was not expected. That difference was significant at $p < .05$. The difference between baseline test 1 and posttest for the *SF-36P* was significant at $p = 0.63$ suggesting that there was an improvement over the course of the study, but because there was no difference between time 2 and time 3 following

treatment, improvements in the physical function score of the *SF-36* were likely not caused by the intervention.

Qualitative

To examine the qualitative data, from the one-on-one interviews with the 14 participants, themes were identified and organized in response to the two research questions. The qualitative results show that this creative arts program was perceived as a positive experience both during and after the sessions. When illustrative quotes are included below following each theme, pseudo names will be used to protect participants' autonomy.

The experience of reminiscence and new memories for the participants. In response to the first research question, which was "What is the experience of reminiscence and new memories for the arts-based program participants", themes revealed that participating in the program helped uncover forgotten memories and form new ones. Themes that emerged were (a) *Uncovering hidden memories and learning new things,* (b) *Elation, courage, and self-discovery and,* (c) *Cultivation of a stronger feeling of community through mutual discovery.*

Uncovering hidden memories and learning new things. This theme of reminiscence and learning in the context of the *Dancing Heart* program prominently emerged from the analysis. Participating in the *Dancing Heart* program helped uncover forgotten memories and to form new ones. The music, dance, and story-telling aspects of the program helped to facilitate the participant's reminiscing. Many reported that some songs and improvisation exercises specifically sparked their memories of poems and/or stories from their childhood. For example, Norma reported:

> And listening to the words of the song triggered in my mind the song *The Tree Standing by the Water* and my dad trying to help me make sense of it… So it triggered those kind of memories.

Many participants reported that the program's contents enabled them to reminisce as a group and individually from their pasts. Bernice described:

> …Being part of the program helps trigger some of those memories. Because you recognize things from your past through the music and dance and it motivates you to want to do what you used to do. And that's good because you probably didn't think you could still do it, but when you hear these tunes and you see the dance, then you remember.

All participants interviewed reported that hearing others share their stories triggered memories from their own past, many that they had not remembered for years. They all described this as being a positive experience that the program encouraged through guided story-telling exercises in the group setting. Ethel described:

> I know it's (Kairo's program) reminded us; of some things people say and stories they tell remind me of things that happened to me when I was younger.

In addition to kindling past memories, there were numerous instances of interviewees describing that they were creating new memories over the course of the Kairo's Dance program's sessions. They reported learning new things about one another through story-telling and reminiscence aspects of the program. Annie reported her learning of others through group reminiscence:

> I knew them before the program, but I found out more about them doing the group and sharing stories.

Many participants illustrated this theme by describing the learning of new information such as the lyrics of the "Great Big Love" song sung at the conclusion of each session:

> Regina: Well I've learned that song we sing at the very end about thank you thank you; that's a nice song.

Finally, some participants described learning of new information in the form of new ways to move their bodies:

> Norma: One of the things I learned because we did different things; I learned I can move different parts of my body I didn't know I could move.

The research transcripts here show repeated evidence that many participants were able to engage in reminiscence and learn new movements, lyrics to songs, and information about other participants and the program facilitators. The new things learned within this creative art-based group also included learning more about themselves.

Elation, courage, and self-discovery. Participation in the Kairo's Alive! program elicited a rich array of complex emotions. In addition to joy and happiness, joint art-making triggered curiosity, self-discovery, self-esteem, gratefulness, satisfaction, and even courage and pride to have ventured outside their comfort zone. The majority of memories shared were positive and enjoyable ones to remember and reflect upon and many took great satisfaction and pride in sharing those:

> Annie: I felt very good. It was something I enjoyed sharing.
>
> Ester: I had a very happy life and I think happy things are worth expressing.

The program's content facilitated feelings of courage and the ability to take new risks as described by interviewees. Feelings of courage and readiness to challenge oneself with new things empowered participants.

> Ethel: I know it's made me want to do better which is pretty special and not to do better so you look better than someone else but so that you feel good about yourself about the way you are doing things.

Using their imaginations while simultaneously moving their bodies was another example of challenge described by Betty:

> A lot of it was totally unfamiliar…I am a sponge for new experiences, so I welcomed that. It was nothing I knew…

Feelings of self-discovery emerged in the transcripts in that participants learned new ways of interacting and found themselves questioning their former assumptions of their fellow neighbors and group members.

> Ester: I'm more expressive with myself. [in the past] I kind of used to hold back more because I was, "am I doing this right?, am I doing what I'm supposed to?".
>
> Ethel: I think I probably look at some people in a different way now

Learning about other's stories helped participants develop a different perspective.

> Ester: Some mentioned tragedies in their life well it makes you feel my life is really good I didn't have to go through a tragedy like that. I think it makes you feel more compassionate towards other people.

The above themes and quotes suggest that they were experiencing both recognition and new learning and that the discoveries about themselves generated positive feelings. In addition to those emotions about themselves, there were feelings related to a growing sense of community following new learning about one another.

Cultivation of a stronger feeling of community through mutual discovery. All interviewees described how the joint reminiscence within the program enhanced mutual knowledge, cultural understanding, trust, and sense of community.

> Ester: yes I was I just I didn't think they would be drawing people out as much as they do and it really does draw people out I mean some of the people are different people because we didn't see that side of them.
>
> Marlene: It's good we find that we have many things in common

The participants were able to get to know the other group members through sharing stories which provided the opportunity for them to both learn new things and to find a common history. The playfulness of the participant interactions within *Dancing Hearts* contributed to learning different aspects of each other's personalities

> Vivian: I knew them before the program, but I found out more about them doing the group and sharing their stories.
>
> Ester: it's just good people have opened up and expressed themselves in a way they wouldn't express themselves over a cup of coffee
>
> Ethel: it charges your imagination and then it also gives you a chance to see this side of people that you normally don't get to see and I thought that was great.
>
> Edna: I think too it puts a personality on that person because they've been able to share that so it's kind of like an identity marker… even if I don't remember their first name off the top of my head at least I have a different I feel I know them in a different way than I did before.

These results were overwhelmingly positive in the way the participants described the program and the benefits it had on themselves and their community. Many interviewees described the desire for the program to come more frequently.

Impact of program on perceived overall quality of life. In response to the second research question, "What is the impact of the program on perceived overall quality of life?", themes revealed that participating in the program had a positive impact on their quality of life by generating a sense of renewal in both physical and socio-emotional health. This new experience was perceived as improving positive feelings and well-being during and after the sessions, improved mobility and physical health, and increased their social interactions outside of the program with the other participants. Themes that emerged were (a) *Fun and joy within joint story-telling and art-making activities,* (b) *Increased social interactions outside the program,* (c) *Enhanced mobility and physical health in response to the program's content and,* (d) *Persistent positive mood and feelings of well-being.*

Fun and joy within joint story-telling and art-making activities. An overwhelming theme that emerged was the experience of joy, laughter, and silliness

facilitated by the program's music, stories, dancing, and joint creativity. Laughter and giggles were seen as a welcome diversion.

> Pearl: Most of the time we would just laugh because none of us knows how to direct or anything like that.
>
> Ethel: and it's just a really nice hour or so to get together with people who are having a good time and that's a really nice feeling
>
> Norma: So many of the activities we did, we were just giggling…so that was kind of fun, it was fun to giggle and laugh and be kids again.

Many interviewees described the group interactions such as singing, dancing, story-telling, and joint art-making.

> Audrey: Yeah it gives me a positive mood it does. I enjoy it and it gives me a positive mood because there's lots of times when I'm in a depressed mood so when I go to that I have fun a feeling and [laughs] decide to act crazy or whatever [laughs].

A common statement from the interviewees as to why Kairos was so enjoyable for them was reported to be due to being in a group setting, this joint positive experience facilitated increased social interactions outside of the program.

Increased bonding and social interactions beyond the program. Many interviewees reported that because of the bonding that happened during the program, their social interactions outside of the program increased. Some reported feeling more comfortable in their apartment complex and more at home due to making some friends as a result of the program.

> Lucy: got to know them better you know we would talk before and after sessions and even during sessions they would share their stories.
>
> Marlene: Oh yeah. You know because I was kind of being new back in the area and I just felt like I wasn't part of the community. But now I sit with three or four ladies.

Being in the program with one another sparked greater interaction and even the formation of social groups within the building. Getting out of their apartment and interacting more often with others was an overwhelmingly positive result of the Kairos sessions reported among the interviewees.

> Norma: also I was going to supper or lunch one day and I was waving at some of the people and I thought, wow, I might not talk to these people, but I know a lot of people here. I know their faces. I smile and wave and talk to them in the elevator and stuff.
>
> Lucy: well there was one lady I didn't know when I first started and we always said hi and we got to know each other by the end and I know where she lives now and we can wave to each other across the balcony
>
> Pearl: We have started dominos and trying to get a card group together

It was apparent through the emergent themes from the transcripts that the program succeeded in increasing the number of social interactions outside of the program as reported by the interviewees. Another reported benefit from the interviewees was the impact the program had on physical health and mobility.

Enhanced mobility and physical health in response to the program's content. For many of the participants, this program was the only form of exercise they were receiving for the week. Participants indicated that *Dancing Heart* did not only stimulate dance movements during the sessions, but also resulted in greater body movements to music in-between sessions.

> Pearl: Most of the time we would just laugh… That's just the way it is [laughs] music makes you move.
>
> Lucy described how she now moves more at home: I guess I find myself more when I am watching TV and such and a song comes on and I see myself moving to the music.

Many of the participants recognized that exercise is important and necessary to remain healthy and fit, but reported that they may not have a way to exercise consistently

due to a variety of reasons such as transportation, lack of programs available at their housing complex, or the poor weather conditions. The interviewees reported appreciation and thanks to the Kairos's program for bringing exercise to them in a fun, creative, and interactive way. Participants reported that this form of exercise really benefitted them and motivated them to leave their apartment and be active.

> Annie: I thought it was kind of fun exercise that was a lot of fun. Something to do in the afternoon other than play dominoes all day. …the music makes it so much more fun, so much more easier to do.
>
> Norma: And I think just being able to keep moving for fun, not because I have to get something, but you know in my mind it was just for fun.

In describing the physical outcomes of the program, some reported noticing increase in strength and range of motion in their arms and legs. Many were encouraged to find that they could move their bodies in ways they did not realize they were able to do before participating in the program.

> Norma described: …Well I think it made a difference just because I got physically tired, which is kind of nice. When you aren't doing that anymore, it felt kind of good to be that kind of tired.
>
> Ester described how she participated in the first few sessions compared to the last: I couldn't get up and stand and participate but I can now..getting up on my feet and trying to move because I couldn't do that before..it's been good for me.
>
> Lucy: I like the idea that it's making my arms stronger

Some interviewees also described an increase in energy and endurance levels since the start of the program.

> Regina: well it seems like I can stand a little bit longer and that is after I have had the program and I am more energized like in my thinking; I think now you can get this done and I used to not be able to get dishes done in one whole you know all 15 minutes or something and now I seem to have a little bit more desire to or challenge myself to say you can do all of it the washing, the drying and putting away so I think that has helped.

> Bernice: it does help your health and that's what's important. It does help. It helps the breathing and it helps the joints and all that other stuff.

A final emerging theme reported among the interviewees was the increase in mobility experienced as a result of the program

> Pearl: I think I got a lot a lot more mobile. In fact I use the steps here all the time, where when I first came in I was lazy.

> Norma: I'm actually doing more now than I ever did when I had the walker, more active.

While describing the physical benefits the program brought to them, interviewees stated that a motivating aspect of the program was the level of enjoyment it generated. Perhaps due to a combination of all the previous benefits the interviewees described, an additional emerging theme from the transcripts was an increase in overall mood and feelings of well-being.

Persistent positive mood and feelings of well-being. The playful and supportive atmosphere of the program enabled the participants to let loose and be themselves with one another. Many participants reported that the program facilitated positive mood and feelings, both during and after, the sessions.

> Annie: Kind of helped my self -esteem, to get to do more. It's something you should do that helps one's self-esteem and you can exercise and move and you meet new people and new ideas.

> Ester: I realized you can be more freer with people if you are freer with yourself.

> Regina: just more feeling of satisfaction and feeling better about myself that I did do something even though I battle with fatigue all the time that I did get something done.

> Norma: It always helps when you smile, it always makes a difference and we did that almost every time.

These powerful feelings of well-being helped combat the loneliness of living alone for some of the interviewees. Many reported having felt depressed prior to the program, but felt elated and encouraged during the program. The program was described as a distraction for some's problems and worries.

> Bernice: And it make you feel good. I feel this helps people that have the depression of life I'll call it.
>
> Ethel: it's easy to get down when you live by yourself and I don't mind living by myself but you don't stand around and make jokes and laugh at yourself you know. So it's been a really good experience for me and I like all the people we've gotten to know they're all so generous themselves. I always come away from it feeling good and I always feel good during the hour.

In summary, narrative analysis revealed strong feelings of improved quality of life in the physical, cognitive, and emotional domains as a result of the arts-based program.

Discussion

This study aimed to describe the importance of a creative arts dance program for older adults living in senior congregate housing. Specifically, this study focused on the direct impact and experience of the participants in regards to their cognition and memory, quality of life, and overall sense of community. A mixed methods approach was used to capture the artistic experience more completely (Creswell & Clark, 2007). This provides us with a well-rounded basis of evidence. Combining qualitative and quantitative data provides rich evidence about the impact of a creative arts-based program on older adults. The results found in this research study suggest that an art-based dance and reminiscence program, such as the Kairo's dance program, can have a positive impact on participant's cognition and overall quality of life as well as promote a sense of community in older adults living independently in congregate senior housing. Although we did not intentionally recruit people with limited cognition, the fact that the average scores on the *MoCA* was below 25 at baseline suggests that the results are applicable to older adults with mild cognitive impairments (MCI), now known as mild neurocognitive disorder (American Psychiatric Association, 2013). The question could reasonably be asked whether the people with higher cognition self-selected out of the *Dancing Heart* sessions, potentially biasing the remaining sample towards lower cognitive scores. For this reason, the *MoCA* scores of the participants who dropped out or did not attend more than half of the program's sessions were computed and found that their average scores (M = 20.78, SD = 4.97) also indicated MCI, indicating that differential drop out rates can be ruled out.

The reason for this finding remains unclear, but it could indicate that the average cognitive status of older adults living in congregate housing is lower than expected for independently living individuals.

The quantitative and qualitative results will be discussed together following each research question.

Experience of Reminiscence and New Memories

The first research question about the experience of reminiscence and new memories in the arts-based dance program was measured by the results of the *Montreal Cognitive Assessment* (*MoCA*) and through the qualitative data received through the interviews of the participants related to memory and learning. The results suggest that the arts-based program did have a positive impact on cognition and stimulated reminiscence, the formation of new memories, and the development of new perspectives in the participants. The quantitative results show that the scores on the *MoCA* following the program were significantly higher ($p < .1$) than at the baseline 2 measurement. Since, in this quasi-experimental design, participants served as their own control (baseline 1 to baseline 2 comparison), this difference between baseline 2 and post- test can establish a causal link between the program and the outcome. Although the average *MoCA* score for this sample stayed below cutoff for of MCI at posttest (< 26) throughout the study, the improvement in memory found here as a results of the arts-based program is consistent with theories of brain plasticity and with the existing research on the positive impact of art programming on cognition (Skingley & Vella-Burrows, 2010). This unique creative-based intervention strategy is more than just physical exercise as it encourages participants to think creatively and express themselves through music and dance while

being socially engaged with others. Interventions such as these have been found to benefit cognitive health in its participants (Coubard, Duretz, Lefebvre, Lapalus, & Ferrufino, 2011; Houston, 2005; Stacey and Stickley, 2008 &; Strassel, Cherkin, Steuten, Sherman, & Vrijihoef, 2011). The current study adds to this body of literature by showing that those benefits extend to older adults with mild neurocognitive impairments. Along with the improvement in cognition, qualitative results show that the program facilitated joint reminiscence and new learning.

The ability to engage in reminiscence and create new memories from this program were common themes that emerged from the interviews. Stimulating activities such as miming and dancing during the sessions of the program enhanced learning of new music and dance moves. Importantly, it also allowed participants to learn meaningful information about one another. The content of the program encouraged these things through facilitating the participants to share stories from their pasts. Often times, nostalgic memories were retrieved and then shared with the group as a result of hearing songs or music from their youth. These results are consistent with research that shows people with neurocognitive impairments test better when listening to music (Larkin, 2001). The reminiscence that occurred during the program was often positive memories that came to mind when triggered by the music or others' stories. This is consistent with research that shows memory recall is often improved with music through the release of hormones and activation of the amygdala (Cuddy & Duffin, 2005; Cowles et al., 2003).

The qualitative research data from this study also revealed evidence to suggest that the participants experienced new learning about themselves or self-discovery through being challenged by different aspects of the program. The participants described during

the interviews that they experienced risk taking and feelings of courage during activities the *Dancing Heart* program provided them. Previous research did also find that creative arts dance programs can inspire participants to expand their horizons and learn new things while increasing feelings of well-being (Lin, McClear, & Tabourne, 2008). Previous research on the *Dancing Hearts* program in two long term care facilities found that the program's content often created an opportunity for reminiscences for the participants which was reported as being a positive experience (Rydholm, 2011). Another qualitative study done on this program and population found that participants were able to learn new songs and movements along with learning new things about fellow residents participating in the program (Schafer, 2011). It is interesting to note that this program had very similar effects on the participants in a long-term care facility as they did in the current study in independent senior living facilities. Our findings extend previous research by showing that such programs can stimulate self-discovery and lead participants to challenge their limits. The reminiscence and new memories that occurred in the program were reported by the interviewees as meaningful and important which impacted their quality of life in a positive way.

Impact of Program on Perceived Quality of Life

When examining quality of life, physical, emotional, and social aspects were assessed through the *SF-36*, a self-report measure to examine the mental and physical aspects of quality of life, and through interview questions. The physical subscales examined physical functioning, role-physical, bodily pain, and general health. Looking at the results for the *SF-36P* do not allow to attribute improvements to the interventions as there was no difference between baseline testing 2 (beginning of treatment) and post-

testing. Aggregate data does not allow for determination as to why there was a significant improvement during baseline but not following treatment. One explanation for this is that changes of health status unrelated to the program in some participants could have influenced the results. Due to the low participant number in our study, it is helpful to have the interviews to document how they felt the program improved their physical health. Many interviewees appreciated that the program came to their facility so they could be physically engaged. They found they were able to move in ways they were not used to and some did not even know they could move as well as they did during the program. Interviewees in this study also reported increases in energy, standing endurance, mobility levels, and strength which is consistent with the findings of Lin, McClear, and Tabourne (2008) who found participants in their art-based program reported improvements specifically in their physical functioning abilities. As in this study, the participants in the research of Lin, McClear, and Tabourne (2008) reported improvements in their mental and social well-being as well.

When looking at the *SF-36M* results, which examined vitality, social functioning, role-emotional, and mental health, the difference in the mean between testing times do show improvements over the course of the study from baseline 1, baseline 2, and the post-test mean score, but due to large variance none of the results were significant. In addition, improvement following the program was not greater than the improvement at baseline, so it cannot be concluded that changes in the means were due to the program. Through the interview data, themes clearly revealed self-reported improvements in mood and feelings of well-being that participants attributed to the program. This is consistent with the literature showing that the act of reminiscence leads to increased quality of life

through improved interest, interaction, mood, cognition, and social interaction (Stinson & Long, 2014). In addition to reminiscence, *Dancing Heart* facilitators encouraged silliness, laughter, and fun which was reported as a cherished aspect of the program which were also findings in the previous studies (Rydholm, 2011; Schafer, 2011).

Due to the artistic nature of the program, participants were able to interact with one another in novel, fun, and exciting way. This allowed them to learn more about one another and bond in a way they would not over cards or coffee. In turn, this effect persisted beyond the sessions themselves, as interviewees reported increased number of social of interactions in their building which they attributed to their learning about one another in different ways within the program.

Importance of Creative Dance and Story-Telling Program for Senior Housing Residents

The overarching research question, on the importance of a creative dance and story-telling program for senior housing residents, was answered through the examination of the two research questions above. As was discussed, the participants involved in the program were positively affected by the program in numerous ways including cognitively, physically, emotionally, and socially.

Qualitative results show that the program was perceived as having multiple benefits on not only a personal level, but also by enhancing feelings of community. The program allowed for the interviewees to experience a greater sense of mutual understanding, to interact with their neighbors in new ways, and to feel a part of a closer knit community. While it has been found that art-based programming can positively impact participants' social well-being, this current study is contributing to the literature

with its findings of increased feelings of community beyond the time spent together during the sessions. Those findings could inform managers of senior congregate housing and other individuals interested in promoting collegiality and a home-like social environment for elder residents. Similar to our findings, two previous theses on this program found that the proxy informants reported it creating a greater feeling of community through increased personal interactions between residents and staff (Rydholm, 2011; Schafer, 2011).

Many interviewees reported the desire for the program to continue and also for more programs such as this one to come to their facility. The professionals of Kairo's *Dancing Heart* encouraged and facilitated feelings and actions in the participants that they did not think they could do. Kairo's instructors pushed their limits both physically and creatively and although it was out of their comfort zones at times, the interviewees reported feelings of great satisfaction and gratitude for the opportunity to participate in this arts-based program.

Implications for Further Research

The present research showed that participants felt that the art-based program enhanced their sense of community. A recommendation for future research is to further examine this experience of community enhancement that the arts-based program brought to the residents and how that impacts their overall quality of life. Additionally, a study using random assignment of participants would create a stronger experimental design than this within subject quasi-experimental design. This study's design was conducted in a naturalistic setting which had its advantages, but attrition of participants over time reduced the power of the study. Future studies would benefit from a higher number of participants. Although this study was thought to be testing well-elderly residents in a senior housing facility, we found that the average scores (*MoCA)* indicated mild cognitive impairment. Future research may want to test cognition beforehand to better be able to use tools matched to the participants' cognitive levels. This study's qualitative data revealed that some participants experienced an increase in energy and physical activity. Future research could use more objective measures of physical function and social activities than could be obtained through the SF-36 self-report measure. The qualitative results of this study could be used to recommend specific quantitative assessments such as tests of physical function focusing on upper extremities. Another tool to measure quality of life could be more specifically tailored to individuals with mild neurocognitive impairments.

This program was also offered once a week for 90 minutes. Future research could determine the impact of a different schedule, such as twice weekly for a shorter amount of time, on participant outcomes. Follow-up studies could also be conducted to determine long term impacts of the program. Although promising, the research on the benefits of arts for health is still in its infancy and larger studies, using a variety of methodologies and interventions, are needed to inform art-based health promotion efforts in the older adult population.

Limitations

Limitations to this study included challenges associated with small sample size and variability of the sample. Another possible limitation to our study is that the treatment was limited to once a week. Had the program been offered twice or more times a week it could have resulted in more significant improvements. An additional potential limitation was the lack of gender diversity. Results may have been different if there had been a balanced representation of both genders. Finally, a limitation to this study was that we later found out that the participants had scored at MCI level during baseline. Therefore, the cognitive level of the participants could have amplified the limitations that are usually inherent in self-report measures such as the *SF-36* that we used. This could explain the inconsistent results regarding health related quality of life outcome.

Conclusion

Arts-based programming improved cognition in older adults with mild neurocognitive impairments and was perceived as an asset to both the communities and to individual participants. This study provides evidence that creative arts-based interventions such as Kairos *Dancing Hearts* can have a positive impact on older adults living in senior congregate living facilities. It provides good mixed methods evidence that interventions such as this one can improve resident's memory and stimulate reminiscence as well as new learning. The evidence for the effectiveness of the program on quality of life was mixed as the quantitative measure did not support an impact but qualitative themes clearly support perceived improvements in mobility, energy, strength, and feelings of well-being. The program also had an impact on the overall culture of the independent living centers by creating a feeling of closeness and meaning among residents. Those results suggest that integrating of arts-based programming in older adult living facilities may contribute to improving and maintaining physical and emotional health in older adults along with enhancing a sense of community. Kairos *Dancing Hearts* provided the participants with a meaningful way to increase their quality of life.

Appendix A

Additional Literature Review

Memory

Definitions

To understand how a creative arts intervention impacts memory in older adults, it is important to have a basic understanding on the different types of memory and how they impact daily life. Current research on memory is based on the theory that memory is not one unit in the brain, but rather encompasses a variety of memory systems that rely on different brain structures with varying levels of susceptibility to break down over time from age-related or pathological causes. The systems view explains that the different types of memory can be independent of one another because they utilize different areas of the brain (Tulving, 2000). It is now known that there are multiple memory systems in the brain devoted to different memory related functions (Luo & Craik, 2008).

Types of Memory

Memory can be split into two types; long term and short term. Long-term memory can be further broken down into declarative and non-declarative memory. Declarative memory is a conscious memory system where recollection of facts or information is acquired through learning (Luo & Craik, 2008). Declarative memory has two subtypes; semantic and episodic. Semantic memory includes general factual information about the world while episodic memory is autobiographical or remembering past events and experiences (Luo & Craik, 2008). An important distinction between semantic and episodic memory is that episodic involves recollection of past events while semantic does not (Eysenck, 2009).

Nondeclarative memory is also known as procedural memory or implicit memory. Since it is unconscious, it is shown through changes in performance of perceptual or motor skills and learned emotional responses (Breedlove, Watson, & Rosenweig, 2010). Implicit memories do not require effort as opposed to declarative or explicit memory, where intentional recollection is required (Blakemore & Frith, 2008). Nondeclarative memory is typically broken down into three further subtypes; skill learning, priming, and conditioning (Baddeley, 2009). Skill learning is the learning of a task that requires motor coordination; priming happens when exposure to a stimulus assists later responses to the same or similar stimulus; conditioning happens when association between a stimulus and a response occurs and can be broken down further into classical and operant conditioning (Breelove, Watson, & Rosenweig, 2010).

A further distinction can be made between the types of long term memory described above and with short-term or working memory (Breedlove, Watson, & Rosenweig, 2010). Working memory holds small amounts of information to be readily available for access during performance of tasks (Luo & Craik, 2008). This type of memory also helps up remember information while doing something else, or multi-tasking (Blakemore & Frith, 2008).

Memory and Emotions

It has been found that emotionally arousing experiences tend to be remembered better than ones that are not. This enhancement of memory from emotional experience may be caused by the activation of beta-adrenergic receptors by stress hormones from the adrenal gland (Dolcos, LaBar, & Cabeza, 2004). Emotionally significant events have been found to create strong, long-lasting memories and research has found that may be

from a hormonal release affecting the amygdala which causes the formation of these enhanced declarative memories (Dolcos, LaBar, & Cabeza, 2004). Given the focus of the current study, it is important to understand how aging impacts memory.

Memory and Aging

There is a difference between memory decline as a result of aging and memory loss due to pathology. Age related loss in memory functions develops slowly in normal aging, but occur more rapidly in pathologies. It is a common complaint from many older adults that they often experience having more trouble remembering names, finding words, and having more everyday forgetfulness for events such as where they left their keys, or for what purpose they went into a room (Craik & Salthouse, 2000). It has been shown through research that some memory functions show decline from normal aging, and some do not.

Types of memory lost with age. It has been reported that noticeable age related cognitive decline typically begins after age 60, but some studies have shown that age-related decline can begin as early as peoples' 30s and 40s (Craik, 2008; Rhodes, 2004; Schaie, 2005). Various memory systems show different rates of decline; with episodic and working memory usually declining first (Craik, 2008). As evidenced through cross-sectional and longitudinal studies, memory tasks that typically show worse performance with age include recall of pictures, memory for spatial location, word recall, word-finding, and encoding of new declarative memories (Craik, 2008; Hedden & Gabrieli, 2004; Luo & Craik, 2008; Salthouse, 2004; Zelinski, Dalton, & Hindin, 2011;).

Preserved memory in aging. Aspects of memory that typically do not decline with age include semantic memory, emotional processing, and implicit or procedural

learning (Baddeley, 2009; Craik, 2008; Hedden & Gabrieli, 2004; Luo & Craik, 2008; Zelinski, Dalton, & Hindin, 2011). To be more specific, the kind of semantic memory that typically holds up well during aging includes word comprehension and general knowledge questions while the semantic memory that is more age sensitive is word-finding difficulties (Nilsson, 2003). Research has found that emotional processing is not typically affected by normal age related changes (Holland, Ridout, Walford, & Geraghty, 2012). Experimental studies have found that emotionally significant events are better remembered than non-emotionally arousing events (Jonson & Magnusson, 2001). Evidence suggests that the amygdala influences memory-storage processes in other brain regions and is involved in the formation of enhanced declarative memory for emotionally arousing events (Cahill & McGaugh, 1998).

Theories of memory and aging. Declarative memory functioning both impacts and is affected by other cognitive abilities such as attention, executive control, problem solving, information processing speed, and planning which are found to also decline in the course of normal and pathological aging (Bäckman, 2008; Craik, 2008; Raz, 2000). Both environmental and biological factors have been found to influence the normal and pathological declines in memory in age. It has been discovered through neuroimaging studies that the brain atrophies with age with a decrease in brain tissue especially noted in the frontal and medial-temporal lobes which influences declarative memory decline (Baddeley, 2009; Cabeza & Nyberg, 2000; Craik, 2008; Hedden & Gabrieli, 2004; Raz, 2000).

There are many theories on why some memory and cognitive processes hold up better than others during the aging process. One of these theories proposed that reduction

in processing speeds lead to decline in a wide range of cognitive function, however, this theory leaves out other factors that are involved in memory loss and aging such as tasks like free recall where speed in not a factored component (Luo & Craik, 2008; Salthouse, 2004). Another theory is that the amount of attentional resources available for cognitive processing is reduced with age (Craik, Byrd, & Swanson, 1987; Hasher & Zacks, 1979). Furthermore, a less capable inhibitory mechanism is often apparent in aging where inhibition prevents unimportant information from entering working memory and erases irrelevant information (McDaniel & Einstein, 1992). It is known that age-related changes in memory differ among the various memory systems, however, more research is needed to test those theories. Engaging older adults in activities that are meaningful to them could help them focus attention and help with learning.

Dementia and Memory

Different types of dementia impact different types of memory based on the areas of the brain affected by disease. Therefore, it is important to have an understanding on the different kinds of dementia and how they impact a person's memory.

Types of dementia. There are many neurological disorders that can result in dementia. Dementia causes a decline of various intellectual abilities as a result of physical changes in the brain (Carlson, 2010). According to the Alzheimer's Association (2014), the most common form of dementia is Alzheimer's disease, accounting for 60-80% of cases.

Alzheimer's disease involves degeneration of the brain due to pathological accumulation of plaques and tangles, it typically has a slow onset first affecting the hippocampus, with a steady progression resulting in loss of short-term memory in all

stages, gradually affecting personality, behavior, and all aspects of functioning, including loss of long term memory in later stages (Miller, 2012).

Another form of dementia is known as vascular dementia. Vascular dementia is a form of dementia that results from cerebral vascular damage (Doble, 2009). It can have a gradual onset due to small strokes, or a sudden onset if related to a major stroke (Miller, 2012). The typical cognitive impairment for this form of dementia is a dysexecutive syndrome, or impairments in cognitive tasks such as attention, working memory, planning, and so forth (Doble, 2009).

Lewy body dementia named due to the presence of Lewy bodies in the brain which contain damaged nerve cell deposits (Doble, 2009). Lewy body dementia has a slow onset with a progressive decline in cognitive, behavioral, and motor symptoms with functioning being dependent on health status (Miller, 2012).

Frontotemporal dementia presents itself with personality and behavioral changes and initially typically affects language, social skills, thought processing, and decision-making skills with most memory impairments typically occurring later in the disease (Miller, 2012). Some individuals may experience failure to demonstrate basic emotions, neglect in caring for themselves, inability to regulate their own behaviors, and sometimes disturbances in speech and language (Doble, 2009). Memory impairments have different onsets and progressions in the various types of pathology.

Procedural Memory System

As the procedural memory system is supported by different brain areas than the declarative system, it is often times preserved in dementia (Nilsson, 2003). Skills such as walking, biking, and even dancing have become automatic and will usually be

remembered even if conscious memory of facts or events fails (Nilsson, 2003). Brain regions such as the caudate nucleus, putamen, and cerebellum are widely spared from AD-pathology and may be critical areas of procedural learning (Rösler et al., 2002). A study to examine skill learning employed 30 minute waltz-lessons over a 12 day period for patients with moderate Alzheimer's disease and Major Depression (Rösler et al., 2002). The study found that patients with Alzheimer's showed significant improvements in skill learning whereas depressed patients did not (Rösler et al., 2002). This study shows that skill learning is widely preserved in persons with Alzheimer's disease.

Mirror neurons on procedural learning. The mirror neuron system (MNS) was originally identified in primates and is a neurophysiological circuit located in the premotor cortex that has been found to selectively activate when executing or observing another person performing the same action or expression of emotion (Berrol, 2006; Di Pellegrino, Fadiga, Fogassi, Gallese, & Rizzolatti, 1992). Studies have found that the neurons activated in an individual who is simply watching a person perform a movement are the identical neurons activated in a person who is engaged in performing the action (Berrol, 2006). Some researchers believe that procedural motor learning is facilitated by this MNS (Garland & Sanchez, 2013; Wolf, Gales, Shane, & Shane, 2000). It has been suggested that the MNS is important for not only understanding other's movements, but also for generating one's own plans for action and execution (Fogassi et al., 2005; Shaun, 2003). For example, one study found that simply observing another person play guitar did not activate MNS as much as it did when observing another person play with the intent to learn and replicate (Buccino et al., 2004). Another study found that procedural motor learning is done best through animation rather than static visual cues and found

that this higher activation in the MNS resulted in better performance from the learner (Garland & Sanchez, 2013). This particular study concluded that animations that most significantly activate the MNS, produce the largest benefits when learning new procedural motor movements (Garland & Sanchez, 2013). These studies suggest that the MNS facilitates procedural learning, which we know is typically spared in persons with dementia of the Alzheimer's type. Interventions involving imitation of movements, such as dance therapy, would facilitate the activation of these mirror neurons.

Appendix B

ST. CATHERINE UNIVERSITY

The Experience and Impact of Creative Dance and Story Telling in Community Dwelling Elders **RESEARCH INFORMATION AND CONSENT FORM**

Introduction:

You are invited to participate in a research study investigating the experience and benefits of dance. This study is being conducted by Lisa Dutton, Physical Therapy faculty, Catherine Sullivan and Kristi Haertl, Occupational Therapy faculty and their graduate research assistant Courtney Holmes, occupational therapy student and Therese Wengler, occupational therapy student. You were selected as a possible participant in this research because you will be participating in the Dancing Heart™ program and you expressed an interest in taking part of the research study associated with that program. Please read this form and ask questions before you decide whether to participate in the study.

Background Information:

The purpose of this study is to determine whether dance can improve memory, mood, balance, creativity and overall quality of life in older adults. Approximately 30 people are expected to participate in this research.

Procedures:

If you decide to participate, you will be asked to complete 4 assessments at three different points in time. The first time will be about one month prior to the start of the Dancing Heart™ program, the second time will be at the start of the program and the third time will be about 3 months (12 weeks) into the program. The 4 assessments will test your memory, mood, balance, creativity and overall quality of life. They will be administered 1:1 with you by one of the investigators listed above at a time and place convenient to you. The 4 assessments will take about 45 minutes to complete at each of the three points in time. Most of the assessments are simple surveys and we will assist you in completing them. The balance assessment will be ask you to complete activities such as standing up, standing with eyes open and closed, moving between chairs and picking an object off the floor. If you are interested in sharing your experience of the program verbally in an interview, you can also give consent below. Only a subset of the participants will be taking part in interviews. Those interviews will only take place once about 2 months after the start of the program and ask you about your experience and impressions of the program and its benefits. They will take place in a time and place convenient to you and be tape-recorded.

Risks and Benefits:

The study has only minimal risks. There is a minimal risk of physical injury to participants when completing the Berg Balance Scale. This scale is a commonly used assessment consisting of

typical every-day activities, so it does not present a risk over and above the low risk of a normal physical therapy evaluation. This assessment will be conducted by or under the supervision of licensed physical therapist or occupational therapist and a gait belt will be used.

There are minimal benefits to participation for individual participants. Your scores on the various assessments and their changes over time are available upon request.

Compensation:

If you participate, compensation will be provided as follows: You will receive $15.00 if you participate in the study to the end (12 weeks/3 testing periods) and attend most Kairos Dancing Heart sessions. You will receive an additional $5.00 if you are selected to participate in the interview, for a total of $20.00 given as a check at the end of the study.

Confidentiality:

Any information obtained in connection with this research study that could identify you will be kept confidential. In any written reports or publications, no one will be identified or identifiable. Only group data will be presented of the assessment results. Unless you request it, no one else besides the researchers will know the results of your individual assessments. Interview results will include direct quotes but will not identify you.

We will keep the research results in a password protected computer and only the researcher(s) named in this form will have access to the records while we work on this project. We will finish analyzing the data by December of 2013. We will then destroy all original reports and identifying information that can be linked back to you. The tape recordings of the interviews will be transcribed by one of the researchers named above, or a research assistant, and the transcript will not include your name or any information identifying you. Only the transcript will be kept and the original tape will be destroyed by December 2013.

Voluntary nature of the study:

Participation in this research study is voluntary. Your decision whether or not to participate will not affect your future relations with Kairos Dance Theatre, Osceola Place Apartments or St. Catherine University in any way. You can refuse to answer any question if you choose. If you decide to participate, you are free to stop at any time without affecting these relationships, and no further data will be collected. Participation in all of the testing sessions and the interview is required for the full $20.00 payment.

Contacts and questions:

If you have any questions, please feel free to contact me, Lisa Dutton, at 651-690-8126 or Catherine Sullivan at 651-690-8602. You may ask questions now, or if you have any additional questions later, I will be happy to answer them. If you have other questions or concerns regarding the study and would like to talk to someone other than the researcher(s), you may also contact John Schmitt, PhD, Chair of the St. Catherine University Institutional Review Board, at (651) 690-7739.

You may keep a copy of this form for your records.

Statement of Consent:

You are making a decision whether or not to participate. Your signature indicates that you have read this information and your questions have been answered. Even after signing this form, please know that you may withdraw from the study at any time and no further data will be collected.

_____

Check A or B below

A- I consent to participate in the study and only wish to do the assessments _____

B- I consent to participate in the study and wish to be considered for the interview and agree to be audiotaped ____

_____

Signature of Participant Date

_____

Signature of Researcher Date

Appendix C

Interview Guide - Dancing Heart Program Study

1. What is your name?
2. What is your age?
3. What is your general mobility level within your home?
4. What is your general mobility level within your community?
5. What was your past experience with music?
6. What was your past experience with dance?
7. When you first heard about the Dancing Heart Program, what was your initial expectation of the program?
8. Can you describe your reaction to the first time you participated in Dancing Hearts?
9. Were you surprised by any aspect of the program?
10. Which aspect of the program do you particularly enjoy?
11. Can you describe what you like about music played in the program?
12. Can you tell me more your experience of the dancing part of the program?
13. Were any aspects of the Dancing Heart programs challenging?
14. Do you feel that the movements you do during Dancing Hearts have an impact on your health?
15. Have you felt a change in your level of mobility since participating in Dancing Hearts?
16. Does the program trigger some special memories? How does it make you feel?
17. What is your relation to the other participants in the program during Dancing Hearts?
18. Do you feel that experiencing the program together influences your interaction with others outside the program?
19. Do you feel that the program stimulates your imagination or creativity? Can you give examples?
20. Are you learning new things (songs, movements) in the context of this program?
21. Overall, do you feel that the program is having an impact on your mood, or on how positive you feel about your life?
22. What is your favorite part of the program?
23. Do you have any suggestions for the program or future sessions?
24. Is there anything else you wish to say about your experience of Dancing Hearts?
25. Thank you for your participation.

Appendix D

CODING SHEET		
	Code	Description /notes
DEMOGRAPHICS/PERSONAL HISTORY		
Autobiographical memories	DEMO-BIO	Recounting of one's lives, not explicitly related to Kairos Any recounting of one's life not explicitly related to Kairos
Cultural/ethnic experience	DEMO-CULT	Recounting of own tradition, culture Birthday, celebration
Experiences with music/art/creativity	DEMO-ART	Recounting experiences involving participation in the arts (audience or art making)
Other	DEMO-OTH	Not sure, "unintel"
HIST		
Reminiscence triggered by dancing hearts	HIST-REMIN	Recounting of memory triggered by dancing heart experience
Self sharing/disclosure with Dancing hearts participants	HIST-SHAR	Recounting something that shared with dancing hearts participants
Other	HIST-OTH	"thank you" (i.e., "thank you for sharing") Not sure, "unintel"
Leaning/memory: MEM		
New learning song/music	MEM-MUS	New learning of music-related material within Dancing Hearts Rhyme
New learning, physical movement	MEM-PHYS	New learning of movement, dance within Dancing Hearts describes doing/learning new movement
New learning each other	MEM-OTH	New learning about one another (not observed) NOTE: Only use this code if cannot use the OBS code below for specific learning about other participants
Relearning	MEM-LEAR	Learning something that used to know but forgot. Memory triggered by Kairos (i.e, by music, poem, etc.)
Forgetting	MEM-FORG	Discusses something that can't remember or can't remember well NOTE: If discusses overall loss in memory, would be coded under HEALT-STAT below
Other	MEM-OTH	Not sure, "unintel"
Creativity/imagination/flow: CREAT		

imaginative storytelling self	CREAT-STORY	NOTE: <u>If observed</u> in others, would be under OBS code below Not observed Describes creating stories in Kairos, stimulated by experience, imagination stimulated, "think on feet"/problem solve
Engagement/ Lose track of time	CREAT-ENGAG	Engagement in Kairos activities. Includes sense of "Flow" (total immersion, losing track of time)
New feeling/experience	CREAT-FEEL	Describes experiences within Kairos that didn't feel or feel the same way before.
New movement, creating new dance	CREAT-MOV	Describes creating new movement, dance (NOT OBSERVED, if observed code: OBS-MOV)
Other	CREAT-OTH	Not sure, "unintel"
Challenges: CHALL		
Recurring/past challenges	CHALL-PAST	Needs to explicitly describe them as challenges, NOTE: If not explicit challenges, code as HIST-BIO for autobiographical memores
New Challenges	CHALL-NEW	New challenges within Kairos. NOTE: If not related to Kairos, code as HIST-BIO
Collaborative problem solving	CHALL-SOLV	
Other	CHALL-OTH	Not sure, "unintel"
Emotions (self): EMOT		
Anticipation/Hope	EMOT-ANT	Looking forward to (related to Kairos)
Joy – fun – positivie mood self	EMOT-POS	Related to Kairos experience Laughter, "laugh" Any positive (i.e., "good", "fun")
Poingnancy	EMOT-POIGN	Simultaneous sadness and happiness. Related to Kairos experience
Nostalgia	EMOT-NOST	Wistful about past (sad). Related to Kairos
Sadness	EMOT-SAD	Mourning, crying, depressed feelings. Related to Kairos
Spiritual/transcendent	EMOT-SPIR	Related to Kairos. If not: code under DEMO for personal demographics
Other	EMOT-OTH	Not sure, "unintel" "um"
Socio-Emotional connection: SOC		

Feeling connection	SOC-CONN	outside Kairos with Kairos participants, nor not specified where, but still with Kairos participants (OR non participant)
Feeling connection within Kairos	SOC-KAIR	During Kairos (include: new participants, and "as group")
Feeling empathy	SOC-EMP	With Kairos participants, during or outside Kairos
Feeling of trust	SOC-TRUS	Witih Kairos participants or Kairos facilitators, whether during or outside Kairos
Feeling of validation	SOC-VAL	With Kairos participants or Kairos facilitators during kairos
Other	SOC-OTH	Not sure, "unintel"
Code both	SOC-CONN and SOC-KAIR	Does not specify during (SOC-KAIR) or outside (SOC-CONN) Kairos
Observe/describe others: OBS		
Observation of Joy – fun – mood in others	OBS-FUN	
Observe imaginative storytelling other	OBS-IMAG	
Life stories others	OBS-STORY	Include cultural references of others (code DEMO-CUL if self/not observed others)
New physical movement others	OBS-MOV	Observe moving, describes observing movement of others in Kairos (code MEM-PHYS if learn new movement self/not describing observed others)
Other	OBS-OTH	Not sure, "unintel"
Health: HEALTH		
Health status and changes -general	HEALTH-STAT	Describes physical, cognitive, emotional health status. Includes health changes (worsening or improving) before Kairos Include mobility status, exercise
Changes physical health/mobility due to Kairos	HEALTH-PHYS	Describes changes to physical health attributed to Kairos
Changes cognitive health/memory due to Kairos	HEALTH-MEM	Describes changes to cognitive health attributed to Kairos
Changes mood due to Kairos	HEALTH-MOOD	Describes changes to emotional health attributed to Kairos

Barrier to health	HEALTH-BARR	Describes challenges to health
Other	HEALTH-OTH	Not sure, “unintel”
Kairos staff”		
Encouraging, supportive,		Describes Kairo’s facilitators engaging in acts of encouragement/support towards participants
Creative opportunities.	KAIR-OPP	Describes creative opportunities in Kairos
Want more Kairos.	KAIR-MORE	Express either sadness Kairos is ending or the want for it to continue
Other	KAIR-OTH	Not sure, “unintel”
Kairos staff	KAIR-STAFF	Mentions Kairos staff, “they”
Expectations	KAIR-EXP	Describes expectations prior to Kairos/signing up, describes signing up

References

Aarts, S. S., van den Akker, M. M., Tan, F. S., Verhey, F. J., Metsemakers, J. M., & van Boxtel, M. J. (2011). Influence of multimorbidity on cognition in a normal aging population: A 12-year follow-up in the Maastricht Aging Study. *International Journal of Geriatric Psychiatry*, *26*(10), 1046-1053. doi:10.1002/gps.2642

Adams, K., Roberts, A., & Cole, M. B. (2011). Changes in activity and interest in the third and fourth age: Associations with health, functioning and depressive symptoms. *Occupational Therapy International*, *18*(1), 4-17. doi:10.1002/oti.304

Alpert, P. T., Miller, S. K., Wallmann, H., Havey, R., Cross, C., Chevalia, T., ... & Kodandapari, K. (2009). The effect of modified jazz dance on balance, cognition, and mood in older adults. *Journal of the American Academy of Nurse Practitioners*, *21*(2), 108-115.

Alzheimer's Association. (2014). *Types of Dementia.* Retrieved from: http://www.alz.org/dementia/types-of-dementia.asp

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed). Washington, D.C: American Psychiatric Association.

Bäckman, L. (2008). Memory and cognition in preclinical dementia: What we know and what we do not know. *The Canadian Journal of Psychiatry/La Revue anadienne de Psychiatrie*.

Bacsu, J. R., Jeffery, B., Johnson, S., Martz, D., Novik, N., & Abonyi, S. (2012). Healthy

aging in place: Supporting rural seniors' health needs. *Online Journal of Rural Nursing and Health Care*, *12*(2), 77-87.

Baddeley, A. (2009). Memory and aging. In Baddeley, A. D., Eysenck, M. W., & Anderson, M. C., *Memory* (pp. 94-112). Hove England: Psychology Press.

Ball, K., Berch, D. B., Helmers, K. F., Jobe, J. B., Leveck, M. D., Marsiske, M., & Willis, S. L. (2002). Effects of cognitive training interventions with older adults. *JAMA: The Journal of the American Medical Association*, *288*(18), 2271-2281.

Barondess, J. (2008). Toward healthy aging: The preservation of health. *Journal of the American Geriatrics Society*, *56*(1), 145-148. doi:10.1111/j.1532-5415.2007.01513.x

Berrol, C. F. (2006). Neuroscience meets dance/movement therapy: Mirror neurons, the therapeutic process and empathy. *The Arts in Psychotherapy*, *33*(4), 302-315.

Blakemore, S. & Frith, U. (2008). Learning and remembering. In Jossey-Bass Inc., *The Jossey-Bass reader on the brain and learning* (pp. 109-119). San Francisco: Jossey-Bass.

Bonder, B. R. (2009). Growing old in today's world. In Bonder, B. R. & Dal Bello-Hass V. (Ed.), *Functional performance in older adults* (3rd ed). (pp.3-21). Philadelphia, PA: F. A. Davis Company. ISBN_13: 978-0-8036-1688-2

Boris, R. (2001). The root of dance therapy: A consideration of movement, dancing, and verbalization vis-à-vis dance/movement therapy. *Psychoanalytic Inquiry*, *21*(3), 356-367.

Bräuninger, I. (2012). The efficacy of dance movement therapy group on improvement of

quality of life: A randomized controlled trial. *The Arts in Psychotherapy, 39*(4), 296-303.

Brazier, J. 1., Harper, R., Jones, N. M., O'cathain, A., Thomas, K. J., Usherwood, T., & Westlake, L. (1992). Validating the SF-36 health survey questionnaire: New outcome measure for primary care. *BMJ: British Medical Journal, 305*(6846), 160.

Breedlove, S. M., Watson N. V. & Rosenzweig, M. R. *Biological Psychology: An Introduction to Behavioral, Cognitive, and Clinical Neuroscience* (6th Edition 2010). Sinauer Associates, Inc. Publishers.

Bruesewitz, Anna K. W., "Therapeutic Use of Self: The Impact on the Health and Wellness of Older Adults Involved in a Creative Dance Program" (2012). *Master of Arts in Occupational Therapy Theses.* Paper 6.

Bryant, L. L., Corbett, K. K., & Kutner, J. S. (2001). In their own words: A model of healthy aging. *Social Science & Medicine, 53*(7), 927-941.

Buccino, G., Vogt, S., Ritzl, A., Fink, G. R., Zilles, K., Freund, H. J., & Rizzolatti, G. (2004). Neural circuits underlying imitation learning of hand actions: An event-related fMRI study. *Neuron, 42*(2), 323-334.

Buchman, A. S., Boyle, P. A., Wilson, R. S., Fleischman, D. A., Leurgans, S., & Bennett, D. A. (2009). Association between late-life social activity and motor decline in older adults. *Archives of Internal Medicine, 169*(12), 1139-1146.

Cabeza, R., Nyberg, L. (2000). Imaging cognition II: An empirical review of 275 PET and fMRI studies. *Journal of Cognitive Neuroscience, 12*, 1–47.

Cahill, L., & McGaugh, J. L. (1998). Mechanisms of emotional arousal and lasting

declarative memory. *Trends in Neurosciences*, *21*(7), 294-299.

Carlson, N. R. (2010). *Physiology of behavior.* 10th ed. Allyn & Bacon.

Castora-Binkley, M., Noelker, L., Prohaska, T., & Satariano, W. (2010). Impact of arts participation on health outcomes for older adults. *Journal of Aging, Humanities, and the Arts*, *4*(4), 352-367.

Cohen, G. D. (2006). Research on creativity and aging: The positive impact of the arts on health and illness. *Generations*, *30*(1), 7-15.

Cohen, G. D., Perlstein, S., Chapline, J., Kelly, J., Firth, K. M., & Simmens, S. (2006). The impact of professionally conducted cultural programs on the physical health, mental health, and social functioning of older adults. *Gerontologist*, *46*(6), 726-734.

Colcombe, S. J., Erickson, K. I., Scalf, P. E., Kim, J. S., Prakash, R., McAuley, E., Elvasky, S., Marquez, D. X., Hu, L., & Kramer, A. F. (2006). Aerobic exercise training increases brain volume in aging humans. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, *61*(11), 1166-1170.

Coubard, O. A., Duretz, S., Lefebvre, V., Lapalus, P., & Ferrufino, L. (2011). Practice of contemporary dance improves cognitive flexibility in aging. *Frontiers in Aging* Neuroscience, 313. doi:10.3389/fnagi.2011.00013

Cowles, A., Beatty, W., Nixon, S., Lutz, L., Paulk, J., Paulk, K., & Ross, E. (2003). Musical skill in dementia: A violinist presumed to have Alzheimer's disease learns to play a new song. *Neurocase (Psychology Press)*, *9*(6), 493-503.

Craik, F. M. (2008). Memory changes in normal and pathological aging. *Canadian Journal of Psychiatry*, *53*(6), 343-345.

Craik, F. I., Byrd, M., & Swanson, J. M. (1987). Patterns of memory loss in three elderly samples. *Psychology and Aging*, *2*(1), 79.

Craik, F.I.M., & Salthouse, T.A. (2000). Handbook of aging and cognition (2nd ed.). Mahwah, NJ: Erlbaum.

Creswell, J. & Clark, V. L. (2007). *Designing and conducting mixed methods research.* Thousand Oaks: Sage Publications.

Cuddy, L. L. & Duffin, J. (2005). Music, memory, and Alzheimer's disease: Is music recognition spared in dementia, and how can it be assessed? *Journal of Medical Hypotheses, 64*, 229-235.

de Medeiros, K., & Basting, A. (2013). "Shall I Compare Thee to a Dose of Donepezil?": Cultural arts interventions in Dementia care research. *The Gerontologist, (54)*3, 344-353.

Di Pellegrino, G., Fadiga, L., Fogassi, L., Gallese, V., & Rizzolatti, G. (1992). Understanding motor events: a neurophysiological study. *Experimental Brain Research*, *91*(1), 176-180.

Doble, S. (2009). In Bonder, B. R. & Dal Bello-Hass V. Functional performance in older adults (3rd ed). Philadelphia, PA: F. A. Davis Company. ISBN_13: 978-0-8036-1688-2.

Dolcos, F., LaBar, K. S., & Cabeza, R. (2004). Interaction between the amygdala and the medial temporal lobe memory system predicts better memory for emotional events. *Neuron, 42*(5), 855-863.

Erikson E., H. Identity and the Life Cycle. New York: International University Press;

1959.

Eysenck, M. W. (2009). Semantic memory and stored knowledge. In Baddeley, A. D., Eysenck, M. W., & Anderson, M. C., *Memory* (pp. 113-135). Hove England: Psychology Press.

Ford, A. B., Haug, M. R., Stange, K. C., Gaines, A. D., Noelker, L. S., & Jones, P. K. (2000). Sustained personal autonomy a measure of successful aging. *Journal of Aging and Health*, *12*(4), 470-489.

Fogassi, L., Ferrari, P. F., Gesierich, B., Rozzi, S., Chersi, F., & Rizzolatti, G. (2005). Parietal lobe: From action organization to intention understanding. *Science*, *308*(5722), 662-667.

Foster, E. R., Golden, L., Duncan, R. P., & Earhart, G. M. (2013). Community-based argentine tango dance program is associated with increased activity participation among individuals with Parkinson's disease. *Archives of physical medicine and rehabilitation*, *94*(2), 240-249.

Garland, T. B., & Sanchez, C. A. (2013). Rotational perspective and learning procedural tasks from dynamic media. *Computers and Education*, *69*, 31-37.

Gutman, S. A., & Schindler, V. P. (2007). The neurological basis of occupation. *Occupational Therapy International*, *14*(2), 71-85.

Hagen, B., Armstrong-Esther, C., & Sandilands, M. (2003). On a happier note: Validation of musical exercise for older persons in long-term care settings. *International Journal of Nursing Studies*, *40*(4), 347-357.

Hamill, M., Smith, L., & Röhricht, F. (2012). ‘Dancing down memory lane’: Circle

dancing as a psychotherapeutic intervention in dementia—a pilot study. *Dementia, 11*(6), 709-724.

Hansen-Kyle, L. (2005). A concept analysis of healthy aging. *Nursing Forum, 40*(2), 45-57. doi:10.1111/j.1744-6198.2005.00009.x

Hasher, L., & Zacks, R. T. (1979). Automatic and effortful processes in memory. *Journal of Experimental Psychology: General, 108*(3), 356.

Havighurst, R. J. (1963). Successful aging. In R. H. Williams, C. Tibbets, & W. Donahue (Eds.), *Processing of Aging, Vol. I* (pp. 299-320). New York: Atherton.

Hedden, T., & Gabrieli, J. D. (2004). Insights into the ageing mind: A view from cognitive neuroscience. *Nature Reviews Neuroscience, 5*(2), 87-96.

Hoban, S. (2000). Motion and emotion: The dance/movement therapy experience. *Nursing Homes: Long Term Care Management, 49*(11), 33-34.

Holland, C. A., Ridout, N., Walford, E., & Geraghty, J. (2012). Executive function and emotional focus in autobiographical memory specificity in older adults. *Memory, 20*(8), 779-793.

Houston, S. (2005). Dance for older people. *Primary Health Care, 15*(8), 18-19.

Johansson, C. (2002). Integrity versus despair: An Eriksonian framework for geriatric rehabilitation. *Topics in Geriatric Rehabilitation, 17*(3), 1-12.

Jonson, H., & Magnusson, J. A. (2001). A new age of old age? Gerotranscendence and the re-enchantment of aging. *Journal of Aging Studies, 15*(4), 318.

Jobe, J. B., Smith, D. M., Ball, K., Tennstedt, S. L., Marsiske, M., Willis, S. L., & Kleinman, K. (2001). ACTIVE: A cognitive intervention trial to promote independence in older adults. *Controlled Clinical Trials, 22*(4), 453-479.

Jorm, A. F., Korten, A. E., Cristensen, H., Jacomb, P. A., Rodgers, B., Parslow, R. A. (2003). Association of obesity with anxiety, depression and emotional well-being: A community survey. *Australian & New Zeal and Journal of Public Health 27*(4): 434–440.

Kairos Dance Theatre: The Dancing Heart program (n.d). Retrieved from: http://kairosalive.org/pages/the-dancing-heart

Knight, T., & Ricciardelli, L. A. (2003). Successful aging: Perceptions of adults between 70 and 101 years. *International Journal of Aging and Human Development*, 56, 223-245.

Kronenberg, G., Bick-Sander, A., Bunk, E., Wolf, C., Ehninger, D., & Kempermann, G. (2006). Physical exercise prevents age-related decline in precursor cell activity in the mouse dentate gyrus. *Neurobiology of Aging*, *27*(10), 1505-1513.

La Rue, A. (2010). Healthy brain aging: Role of cognitive reserve, cognitive stimulation, and cognitive exercises. *Clinics in Geriatric Medicine*, *26*(1), 99-111.

Lacey, A. & Luff, D. (2001). *Trent Focus for Research and Development in Primary Health Care: An Introduction to Qualitative Analysis.* Trent Focus.

Larkin, M. (2001). Music tunes up memory in dementia patients. *Lancet*, 357, 1-3.

Lang, J. E., Moore, M. J., Harris, A. C., & Anderson, L. A. (2005). Healthy aging: Priorities and programs of the Centers for Disease Control and Prevention. *Generations*, *29*(2), 24-29.

Larson, E. B., Wang, L., Bowen, J. D., McCormick, W. C., Teri, L., Crane, P., & Kukull, W. (2006). Exercise is associated with reduced risk for incident dementia among persons 65 years of age and older. *Annals of Internal Medicine*, *144*(2), 73-81.

Lin, L., McClear, E., & Tabourne, C. (2008). The outcomes of therapeutic dance movement on physical and emotional functioning for elderly people. *American Journal of Recreation Therapy*, *7*(1), 25-34.

Lindstrom, H. A., Fritsch, T., Petot, G., Smyth, K. A., Chen, C. H., Debanne, S. M., Lerner, A. J., & Friedland, R. P. (2005). The relationships between television viewing in midlife and the development of Alzheimer's disease in a case-control study. *Brain and Cognition*, *58*(2), 157-165.

Luo, L., & Craik, F. I. (2008). Aging and memory: A cognitive approach. *The Canadian Journal of Psychiatry/La Revue canadienne de psychiatrie*.

McDaniel, M. A., & Einstein, G. O. (1992). Aging and prospective memory: Basic findings and practical applications. *Advances in Learning and Behavioral Disabilities*, *7*, 87-105.

McDougall, G. (2000). Memory improvement in assisted living elders. *Issues in Mental Health Nursing*, *21*(2), 217-233.

McGuire, L. C., Ford, E. S., & Ajani, U. A. (2006). Cognitive functioning as a predictor of functional disability in later life. *American Journal of Geriatric Psych*, *14*(1), 36-42.

Mendes de Leon CS, Glass, T., & Berkman, L. (2003). Social engagement and disability in a community population of older adults: The New Haven EPESE. *American Journal of Epidemiology*, *157*(7), 633-642.

Miller, C. A. (2012). Fast Facts for Dementia Care What Nurses Need to Know in a Nutshell. New York Springer Pub. Co.

Muscari, A., Giannoni, C., Pierpaoli, L., Berzigotti, A., Maietta, P., Foschi, E., Ravaioli,

C., Poggiopollini, G., Bianchi, G., Magalotti, D., Tentoni, C., & Zoli, M. (2010). Chronic endurance exercise training prevents aging-related cognitive decline in healthy older adults: A randomized controlled trial. *International Journal of Geriatric Psychiatry*, *25*(10), 1055-1064.

Nasreddine, Z. S., Phillips, N. A., Bédirian, V., Charbonneau, S., Whitehead, V., Collin, I., Cummings, L. J., & Chertkow, H. (2005). The Montreal Cognitive Assessment, MoCA: a brief screening tool for mild cognitive impairment. *Journal of the American Geriatrics Society*, *53*(4), 695-699.

Nilsson, L. (2003). Memory function in normal aging. Acta Neurologica Scandinavica, 1077-13.

Nilsson, M., Sarvimäki, A., & Ekman, S. (2000). Feeling old: Being in a phase of transition in later life. *Nursing Inquiry*, *7*(1), 41-49. doi:10.1046/j.1440-1800.2000.00049.x

Osborne, J. W. (2009). Commentary on retirement, identity, and Erikson's developmental stage model. *Canadian Journal on Aging*, *28*(4), 295-301.

Pepin, G., & Deutscher, B. (2011). The lived experience of Australian retirees: 'I'm retired, what do I do now?'. *British Journal of Occupational Therapy*, *74*(9), 419-426.

Raz, N. (2000). Aging of the brain and its impact on cognitive performance: Integration of structural and functional findings. In: Craik F. I. M., Salthouse T. A. Editors. *The Handbook of Aging and Cognition*. 2nded. (pp. 1-90). Mahwah (NJ): Lawrence Erlbaum Associates.

Réébola, C. B., & Sanford, J. (2011). Design and technologies for healthy aging. *Physical*

& Occupational Therapy in Geriatrics,*29*(1), 1-4.

Rhodes, M. G. (2004). Age-related differences in performance on the Wisconsin card sorting test: A meta-analytic review. *Psychology of Aging, 19,* 482-453.

Riley, P. K. (2009) Mental function. In Bonder, B. R. & Dal Bello-Hass V. (Ed.), *Functional performance in older adults* (3rd ed). (pp.177-182). Philadelphia, PA: F. A. Davis Company. ISBN_13: 978-0-8036-1688-2

Rösler, A., Seifritz, E., Kräuchi, K., Spoerl, D., Brokuslaus, I., Proserpi, S. M., Gendre, A., Savaskan, E. & Hofmann, M. (2002). Skill learning in patients with moderate Alzheimer's disease: A prospective pilot-study of waltz-lessons. *International Journal of Geriatric Psychiatry*, *17*(12), 1155-1156.

Rowe, J. W., & Kahn, R. L. (1997). Successful aging. *The Gerontologist*, *37*(4), 433-440.

Rydholm, Siri, "Importance of a Dance Program for Long-Term Care Residents" (2011). *Master of Arts in Occupational Therapy Theses*. Paper 3

Salthouse, T. A. (2004). What and when of cognitive aging. *Current Directions in Psychological Science*, *13*(4), 140-144.

Serra, L., Cercignani, M., Petrosini, L., Basile, B., Perri, R., Fadda, L., Spano, B., Marra, C., Giubilei, F., Carlesimo, G. A., Caltagirone, C., & Bozzali, M. (2011). Neuroanatomical correlates of cognitive reserve in Alzheimer disease. *Rejuvenation Research*, *14*(2), 143-151.

Schafer, Kelsey Kristine, "Importance of a Creative Dance Program for the Quality of Life of Long Term Care Residents" (2011). *Master of Arts in Occupational Therapy Theses.* Paper 4.

Schaie, K. W. 2005. *Developmental influences on adult intelligence*. Oxford, U.K.:

Oxford University Press.

Shaun, G. (2003). The imitative mind: Development, evolution, and brain bases. Edited by A.N. Meltzoff and W. Prinz. Cambridge University Press, Cambridge, 2002. pp. 353. ISBN 0-521-80685-2. Infant & Child Development, 12(3), 301.

Skingley, A., & Vella-Burrows, T. (2010). Therapeutic effects of music and singing for older people. *Nursing Standard*, *24*(19), 35-41.

Smyth, K., Fritsch, T., Cook, T., McClendon, M., Santillan, C., & Friedland, R. (2004). Worker functions and traits associated with occupations and the development of AD. *Neurology*, *63*(3), 498.

Stacey, G., & Stickley, T. (2008). Dancing to keep young @ heart. *Mental Health Practice*, *11*(6), 34-38.

Stern, Y. (2006). Cognitive reserve and Alzheimer disease. *Alzheimer Disease & Associated Disorders*, *20*(2), 112-117.

Stinson, C., & Long, E. M. (2014). Reminiscence: Improving the quality of life for older adults. *Geriatric Nursing*, *35*(5), 399-401. doi:10.1016/j.gerinurse.2014.08.006.

Strassel, J. K., Cherkin, D. C., Steuten, L., Sherman, K. J., & Vrijhoef, H. J. (2011). A systematic review of the evidence for the effectiveness of dance therapy. *Alternative Therapies in Health & Medicine*, *17*(3).

Stuckey, H. L., & Nobel, J. (2010). The connection between art, healing, and public health: A review of current literature. *American Journal of Public Health*, *100*(2), 254.

Thompson, B., Sierpina, V. S., & Sierpina, M. (2002). What is healthy aging? Family

physicians look at conventional and alternative approaches. *Generations, 26*, 49-53.

Tulving E. Concepts of memory. In: Tulving E, Craik FIM, editors. *The Oxford hand book of memory.* New York (NY): Oxford University Press; 2000. 33–43.

Vaillant, G. (2002). *Ageing well.* Melbourne: Scribe.

Vaillant, G. E., DiRago, A. C., & Mukamal, K. (2006). Natural history of male psychological health, XV: Retirement satisfaction. *American Journal of Psychiatry, 163*, 682-688.

Vance, D. E., Heaton, K., Fazeli, P. L., & Ackerman, M. L. (2010). Aging, speed of processing training, and everyday functioning: Implications for practice and research. *Activities, Adaptation & Aging*, *34*(4), 276-291.

Vance, D. E., Keltner, N. L., McGuinness, T., Umlauf, M. G., & Yuan, Y. Y. (2010). The future of cognitive remediation training in older adults. *Journal of Neuroscience Nursing*, *42*(5), 255-264.

Verghese, J., Lipton, R. B., Katz, M. J., Hall, C. B., Derby, C. A., Kuslansky, G., Ambrose, A. F., Sliwinski, M., & Buschke, H. (2003). Leisure activities and the risk of dementia in the elderly. *New England Journal of Medicine*, *348*(25), 2508-2516.

Wahlqvist, M. L., & Savige, G. S. (2000). Interventions aimed at dietary and lifestyle changes to promote healthy aging. *European Journal of Clinical Nutrition, 54*(6), S148.

Ware, J. J., Sherbourne, C. D. (1992). The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Medical Care: 30*, 473–83.

Willis, S. L., Tennstedt, S. L., Marsiske, M., Ball, K., Elias, J., Koepke, K. M., &… Wright, E. (2006). Long-term effects of cognitive training on everyday functional outcomes in older adults. *JAMA: The Journal of the American Medical Association, 296*(23), 2805-2814.

Wilson, R., Krueger, K., Arnold, S., Schneider, J., Kelly, J., Barnes, L., Tang, Y., & Bennett, D. (2007). Loneliness and risk of Alzheimer disease. *Archives of General Psychiatry*, *64*(2), 234-240.

Wolf, N. S., Gales, M., Shane, E., & Shane, M. (2000). Mirror neurons, procedural learning, and the positive new experience: A developmental systems self-psychology approach. *Journal of the American Academy of Psychoanalysis, 28*(3), 409-430.

Wrosch, C., Dunne, E., Scheier, M. F., & Schulz, R. (2006). Self-regulation of common age-related challenges: Benefits for older adults' psychological and physical health. *Journal of Behavioral Medicine, 29*(3), 299-306. doi:10.1007/s10865-006-9051-x

Zelinski, E. M., Dalton, S. E., & Hindin, S. (2011). Cognitive changes in healthy older adults. *Generations,35*(2), 13-2.