Literature Review on the use of Montessori Activities with Individuals Diagnosed with Dementia

by

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Dedication

Dad, Mom, Teddi, Yianni, and Logan – Thank you for everything. Proofreading, listening to me stress out day after day, week after week. I love you all!

Ryan - I love you and thank you for putting up with me over the last four years as I studied nonstop, constantly did work, and went on for hours about results that you politely pretended to care about, because I did.

Finally to my friends – I would not be where I am now without you all.

Thank you to all, for making me who I am today.
Abstract

Recently, Montessori methods have been used to help reduce the symptoms of dementia. The purpose of this thesis and literature review is to examine the effectiveness of Montessori methods to increase positive engagement levels in individuals diagnosed with dementia. Peer-reviewed research articles were gathered from online databases accessible to St. Lawrence College, Queen’s University, and Carleton University. Articles that were considered to be relevant were read, and the study method and results section were summarized in a table. The current literature suggests that Montessori methods can be used to decrease the symptoms of dementia in multiple settings including, long-term care facilities, adult day centers, and in the home of the individual. It was found that treating individuals with dementia using Montessori methods may increase independent functioning levels, which may result in a decrease in caregiver stress (Gitlin, Corcoran, Winter, & Boyce, 2001). Further, it was discovered that training multiple agency members from different departments of the agency in Montessori methods led to decreased dementia symptoms (Reimer, Slaughter, Donaldson, Currie & Eliasziw, 2004). For the purposes of future research, it is recommended that additional research be completed on the use of Montessori methods with people who have dementia. Specifically, it is recommended that more research be completed on the use of Montessori methods in the homes of individuals with dementia in order to increase functional independence.
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Chapter I: Introduction

As the world’s population begins to age, the incidence of persons diagnosed with dementia is increasing (Jorm & Jolley, 1998). Jorm and Jolley (1998) explained that this increasing diagnosis is leading to an increased need for treatment of dementia. Dementia is a disease that affects the brain and leads to a progressive decline of mental ability (Chow et al., 2012). Chow et al. (2012) stated that over time, dementia will affect an individual’s intellectual and social skills to the point where everyday tasks become difficult. Dementia affects a person’s decision-making abilities and memory, and may also affect his or her personality (Robins Wahlin & Byrne, 2011). According to Rizzi, Rosset, and Roriz-Cruz (2014), an estimated 42 million people have been diagnosed with dementia around the world and it is expected that the number of people affected by dementia will double, from 42 million to 84 million, between 2020 and 2040. Currently, there are no cures for dementia; still, symptoms of dementia may be treated using medications (Masand, 2000). Consequently, Masand (2000) stated that using medication to treat symptoms of dementia is not always thought to be ethical due to the adverse side effects of the medication. As a result other methods of treatment, such as Montessori-based education, have been used with success in handling symptoms of dementia. The Montessori-based education system is an excellent tool for specialists in the treatment of dementia.

Montessori education was originally created by Italian physician Maria Montessori for children with disabilities (Baligadoo, 2014). O’Carroll (2012) explained that Montessori education places emphasis on individual freedom and independence. Individuals have the opportunity to choose their preferred activity based on a wide variety of options. Montessori education consists of a constructivist model, where the individual learns from working hands-on with the materials instead of through direct instruction (Elkind, 2003). For example, a child may learn how to tell time using a clock that he/she is able to move physically with his/her hands, instead of learning how to tell time by looking at diagrams in a book. While the Montessori education approach was originally designed for use with children, it has been adapted with success for use with people who have dementia (Dreher, 1997). As the use of Montessori methods with people who have dementia increases, the literature on the subject has also expanded.

Dickens (2013) explained that Montessori-based activities for people with dementia can be used in a variety of settings, including both adult day care centers and long-term care facilities (LTCF). The use of Montessori activities in both adult day care centers and LTCF have been shown to increase levels of participation and engagement in persons who have dementia (Orsulic-Jeras, Judge, & Camp, 2000). Participation can be defined as the total amount of activities the individual attends each day, while engagement is defined as the length of time an individual is actively involved in an activity. Increasing participation and engagement is important as some individuals in LTCF either refuse to leave their rooms or attend activities, which may lead to isolation and depression (Lee, Camp, & Malone, 2007). Furthermore, Orsulic-Jeras et al. (2000) also stated that Montessori-based activities can be used in daily living activities, such as dressing oneself or eating, as well as pleasurable activities, such as reading or playing card games.

Often family and friends become overwhelmed while taking care of a person with dementia (Murray, 2014). This often leads to the individual with dementia being placed in a
LTCF. Research completed on the use of the Montessori method with dementia patients suggests that using environmental supports may increase individual independence (Feingold & Werby, 2008). Environmental supports can be defined as altering the environment through the use of materials, time, and space in order to support the individual and positive behaviours (Gross et al., 2004). Examples of environmental support include the use of automatic shut-off timers on ovens and labels on doors to identify the room. According to Feingold and Werby (2008), increasing independence may allow the person with dementia the opportunity to continue living at home for a longer period of time. A clearer understanding on the use of Montessori activities may result in more effective at-home interventions and prolong the time the individual can continue living at home.

Currently, the use of Montessori-based activities with individuals with dementia is primarily implemented by recreational therapists. In 2012, for example, 57% of individuals trained in the Montessori methods were recreational staff, while only 12% of trained individuals were nurses (Elliot, 2012). Elliot (2012) strongly recommended that all members of a LTCF should be trained to implement the Montessori-based activities. The overall training of staff members in Montessori methods is further examined later in this paper.

In summary, the purpose of this literature review is to compare the research on the use of Montessori-based activities with individuals who have dementia covering five main components. The first component consists of dementia and the need for treatment. Next, the adaption of Montessori-based activities designed to teach children school curricula to Montessori-based activities that address the needs of persons with dementia is presented. Thirdly, the use of Montessori methods to increase engagement and participation of individuals with dementia in adult day centers LTCF is explained. Also, whether Montessori activities can reduce caregiver stress and help an individual with dementia continue to live in his/her home longer is examined. Finally, the purpose of professionals, including doctors, nurses, and personal support workers (PSW) being trained in the use of Montessori-based activities with persons with dementia is offered. The overall goal of this paper is to examine the literature on Montessori-based activities with individuals diagnosed with dementia, in order to demonstrate whether these methods are effective in maintaining individual cognitive abilities.

The thesis is comprised of five sections. In the method section, the process by which the research articles were gathered is explained. The method section also reveals the inclusion and exclusion criteria of articles, as well as the databases articles were chosen from. The method section is followed by a literature review, which is further divided into five sections. In the first section of the literature review, articles that provide descriptions of dementia and the need for treatment are summarized. Following this, the history of Montessori education and a background of Montessori-based activities is more thoroughly discussed. The next section of the literature review includes summaries of research articles that used Montessori methods to increase participant engagement in LTCF and adult day centers. In the section that follows, articles are reviewed on the use of Montessori methods at home. Finally, the literature review finishes by summarizing articles on the positive effects of training all agency staff members to implement Montessori-based activities. The results section provides a brief summary of the main findings from each section of the literature review. Finally, the discussion culminates in an examination
of the implications from the results, provides recommendations and suggestions to the agency and reader, and highlights the strengths and limitations in this paper.
Chapter II: Literature Review

Dementia and the Need for Treatment

Dementia is a disorder that affects an individual’s mental processes (Gustafson, 1996). According to Gustafson, dementia is caused either by brain injury or disease, which consequently leads to neural damage. This neural damage interferes with the ability of the brain cells to communicate with one another, which results in communication, behaviour, and thinking problems (Gustafson, 1996). It is important to note that dementia itself is not a specific disease, but a term used to describe a vast number of symptoms that relate to declining memory (Chow et al., 2012). Alzheimer’s disease is the most common form of dementia and accounts for between 60 to 80 percent of all cases (Alzheimer’s Organization, 2015). It is suggested that Alzheimer’s disease is related to amyloid plaques and neurofibrillary tangles, which are a build-up of proteins thought to affect the neurons in the brain that cause brain damage (Alzheimer’s Organization, 2015). The second most common form is vascular dementia, which occurs after an individual has a stroke and also results in brain damage (Alzheimer’s Organization, 2015). There is no single test that is used to diagnose dementia (Fauth & Gibbons, 2013). According to Fauth and Gibbons (2013), the only way dementia can be diagnosed is through a complete medical assessment.

Often, people with dementia experience common symptoms that can manifest in multiple ways. Someone with dementia will endure symptoms relating to a deteriorating memory. Torpy (2008) explained that the individual may begin to have trouble recognizing family members, or even himself or herself in a mirror. Torpy also added that the individual may become unable to find his/her way around or be able to identify commonly used objects. Eventually, dementia will affect areas of the brain, such as the cerebellum, that are responsible for balance and movement. This in turn may lead to a decreased level of mobility in an individual with dementia (Baloyannis, 2007). Baloyannis (2007) declared that an individual with dementia often requires the use of a wheelchair. As dementia progresses, the individual may progressively lose his/her ability to speak (Sajjadi, Patterson, Tomek, & Nestor, 2012). As time goes on, the person who has dementia will begin to struggle to understand what others are saying to him/her, as well as what is going on in their environment (Sajjadi et al., 2012). Furthermore, in the late stages of dementia, the individual may lose his/her appetite and stop eating (Alzheimer’s Organization, 2015). This frequently leads to weight loss, which may cause the individual’s immune system to weaken (Alzheimer’s Organization, 2015). Currently, there is no cure for dementia; however, treatments should be completed to target symptoms such as engagement, mobility, speech and eating (Chow et al., 2012). Environmental supports, such as memory aids, should also be created to ensure the individual has the highest quality of life possible.

The total sum of people who have dementia is the reason why treatment is needed (Elliot, 2012). Prendergast et al. (2010) explained that people are living longer due to the improvement of healthcare. This has resulted in an increase in the geriatric population around the world. Corrada, Brookmeyer, Paganini-Hill, Berlau, and Kawas (2010) revealed that the prevalence of dementia increases chronologically. Currently, there are an estimated 35 million people living with dementia around the world (Rizzi, Rosset, & Roriz-Cruz, 2014). According to Rizzi, Rosset, and Roriz-Cruz (2014) this number is hypothesized to increase to 115 million by 2050. As the incidence rates of dementia continues to increase proper treatments must be found to target symptoms of dementia.
Montessori Methods used with Dementia

An Italian physician, Maria Montessori, created Montessori education, in the early 1900s. It was designed for use with children who had disabilities and who were originally thought to be unteachable (O’Carroll, 2012). O’Carroll (2012) explained that Montessori developed her method after observing the way children learned naturally. Montessori found that children needed very minor persuading to do everyday tasks which, in turn, caused their destructive behaviours to decrease (O’Carroll, 2012). As a consequence, Montessori created the prepared environment, also referred to as the Montessori method or education (Camp, 2010).

Montessori education is described as a model of human development, and when used with children includes an educational approach that is based on the model (Rathunde, 2001). The Montessori method includes two principles. According to Rathunde (2001) the first principle is that individual’s engage in certain behaviour in order to interact with the environment around them. The second principle being that children follow a certain path of psychological development. As a result of these principles, Montessori concluded that children should be able to act freely while in an environment that is prepared according to the Montessori model (Rathunde, 2001). Montessori believed that the prepared environment would allow children to act spontaneously which would lead to optimal development.

Montessori believed that each human demonstrated innate characteristics which she identified as human tendencies (Lillard, 2013). Human tendencies include characteristics such as abstraction, communication, exploration, manipulation, orientation, self-perfection, and purposeful activity etc. It was Montessori’s belief that those tendencies drive human behaviour at every stage of development and as a result the environment should be arranged to facilitate these tendencies. As a result, the Montessori method consists of a prepared environment, which can be defined as an environment that is tailored to the basic human characteristics, as well as the specific traits and personalities of each individual (Lillard, 2013). The environment should be arranged to help the child to be as independent as possible. The Montessori environment often includes the following characteristics: is arranged to facilitate activity; is constructed to meet the individual’s needs; includes a clean environment; is arranged to be orderly; includes materials that support the development of the individual. Montessori methods have been used with children with much success.

Byun, Blair and Pate (2013) evaluated the effects of Montessori methods to decrease sedentary behaviour in 4-year-old children. Sedentary behaviour was defined as the child sitting, or staying in one place. The results revealed that children in Montessori based preschools demonstrated a decrease of sedentary behaviour as compared to children in regular preschools. While not used with individuals who have dementia, the results revealed the success of Montessori methods in decreasing sedentary behaviour in individuals.

In another study completed by Kayili and Kuscu (2012), 14 children who were in the first and second grade received Montessori education. In the Montessori education group, children had seats adjusted based on their height and completed activities that were designed with the students in mind. The Montessori group was compared to a control group, which included 14 children of the same age who did not receive any Montessori education, and instead received schooling through the Pre-School Education Program of Ministry of Education. Social
competence, and school adjustment was measured during this study. Two adjustments were measured under social competence, social behaviour and interpersonal social competence. Social behaviour was defined as the skills needed for the child to independently function in an educational environment. Meanwhile, interpersonal social competence was defined as the necessary skills needed to engage in appropriate social interactions. School adjustment was measured through behaviours such as empathy, cooperation, self-control, sensitiveness in peer relations, and readiness in social respect. This study revealed that children who received the Montessori education showed significantly higher levels of social competence and school adjustment compared to children in the control group.

Camp (2010) stated that Montessori Methods have recently been adapted to use with individuals who have dementia. This practice is sometimes referred to as Montessori Methods for Dementia or the MMFD (Elliot, 2012). It is known that people diagnosed with dementia gradually lose their cognitive abilities which may result in loss of memory, and the ability to walk and talk (Chow et al., 2012). As a result, researchers have questioned the similarities between the developing mind and the degenerative mind (Camp, 2010). This comparison has led researchers to believe that the same interventions may be useful with both kids and the geriatric population (Camp, 2010). While with children, Montessori Methods are usually completed in a classroom, MMFD may be completed with a person who has dementia residing in various locations (Dreher, 1997). Dreher (1997) suggested that the routines and roles in MMFD are created based on the strengths, skills, abilities, interests and needs of the individual. The activities are presented in an environment that supports the cognition and mental losses that are associated with dementia (Elliot, 2012).

Elliot (2012) stated that MMFD was implemented by Camp in 1983. Camp was working with individuals in the late stages of dementia. During this same period of time, Camps’ children were attending a school which implemented Montessori methods to improve the positive engagement levels of the children attending the school. Camp realized that the prepared environment of Montessori education would be beneficial to use with individuals with dementia. As a result, Camp began to individualize the environment of his clients with dementia, which led to a decrease in the symptoms of dementia such as aggression.

Maria Montessori originally created the Montessori method in order to increase independence and engagement levels of children who were diagnosed with behavioural problems (Moretti, 2013). Camp (2010) realized that these goals were also appropriate for the geriatric population who were diagnosed with dementia (Elliot, 2012). Using the Montessori method would allow individuals with dementia the opportunity to increase independence levels, and provide them with an increased satisfaction of life (O’Carroll, 2012). According to Camp, individuals who have dementia still have skills that they can contribute to society and to their families, such as friendship and mentorship (Camp, 2010). In summary, Camp realized that many of the goals of the Montessori method were directly relevant to the needs of individuals with dementia.

Moretti (2013) conveyed that Montessori believed that an individual’s quality of life is defined in part by what activities are available to them. Therefore, Montessori Methods should present a variety of different activities that the individual can choose from, such as scooping soil,
folding laundry, or completing a puzzle (Elliot, 2010). Camp, Cohen-Mansfield and Capezuti (2002) stated that all individuals must feel safe, competent, engage in social interactions, and have meaningful social roles such as that of a friend. Respectively, through MMFD, the environment and activities are prepared to help meet all the individuals’ needs and improve their quality of life.

MMFD should target both the prepared environment and the person and engage the individual in daily activities that contribute to an environment that supports the person and his/her losses (Dreher, 1997). Therefore, according to Camp (2010), Montessori-interventions should focus on working with the strengths the individual still possesses despite the dementia. Elliot (2012) stated that in an example of a Montessori-based activity used by Camp, an individual with dementia is given a spoon that has slots to dig for objects hidden in a tub filled with rice. When the person finds the object in the tub, rice slides through the slots, which leaves the object on the spoon (Elliot, 2012). Elliot explained that this activity helps to increase the crucial motor skills needed for feeding. Elliot stated that it is the therapist’s job to choose appropriate activities for the individual with dementia. Elliot elaborated that the person with dementia should feel connected to the community by contributing his/her skills as best as they can.

Though very similar, MMFD are slightly different than the Montessori Methods designed for children (Dreher, 1997). Dodd-Nufrio (2011) reported that when Montessori Methods are used with children, the activities should be adapted to that of the child. For example, the tables and chairs the child uses should be lowered to fit his/her height and activities should be age appropriate. This strategy of adapting the environment to the person can easily be transferred for an individual with dementia (Dreher, 1997). Individuals who have dementia often feel as if they are disconnected from themselves and their environment (Torpy, 2008). Elliot (2012) explained that in MMFD the environment would be tailored to the individual. Similarly, Dreher (1997) recommended that MMFD activities comprise of tasks that the individual had often completed in the past. Elliott (2012) elaborated on this point when he suggested that the environment be created so that it is more manageable. Examples of more manageable activities consist of breaking the tasks into smaller and more straightforward steps. Additionally, the living spaces of individuals diagnosed with dementia should be modified and individualized to the individual. For example, the rooms should include a bright coloured comfortable bed, in order to make the individual with dementia feel more at ease and satisfied in the living space. Also, the rooms of each individual should include a desk where work can be completed in order to encourage independent tasks. The room should also include a large window in order to promote visual stimulation. Elliot elaborated that signage should be placed all around the living space, to help direct the individual and reduce confusion. Walls and corridors should be arranged so that they provide stimulation. For example, Velcro X and O’s may be placed on the wall for residents to touch. Elliot added that activity rooms should also be organized and set up with the Montessori Method in mind. An example of an activity room may include a nursery where individuals who raised children can complete tasks that relate to taking care of a child. Another part of the room may be designed as a laundry room, with baskets filled with clothes that need to be folded.
In summary, MMFD was originally created by Montessori in the early 1900s to use with children who have disabilities. However, in 1983 this method was adapted by Camp to use with geriatric patients diagnosed with dementia as a separate methodology known called Montessori Methods for Dementia (MMFD). In recent years, MMFD has been used increasingly to treat symptoms of dementia.
Montessori Methods in Adult Day Care Centers and Long-Term Care Facilities

**Adult Day Care Centers.** Eventually, people with dementia are unable to be left alone as they may become a danger to themselves; for example, forgetting to turn the stove off. As a result, the caregivers of individuals with dementia may sign their loved one with dementia up to attend adult day centers. This provides caregivers with the opportunity to work full time or complete household tasks. These adult day centers often are the first step before an individual with dementia is placed in a LTCF. While adult day centers are beneficial for caregivers, research has shown that individuals with dementia rarely participate or engage in activities when they are at these centers (Orsulic-Jeras, Judge, & Camp, 2000). Therefore, interventions to increase engagement and participation are necessary. Since Montessori methods have often been used to increase engagement in children (Byun, Blair, & Pate, 2013), they have also been used at adult day centers to increase engagement in activities.

Principles of Montessori-based programming were used with sixteen residents with dementia, in an adult day centre (Orsulic-Jeras, Judge, and Camp, 2000). The study measured participant activity engagement, which was defined as verbal behaviours as a response to the activity. As in the study by Byun et al. (2013) it was found that individuals were significantly more engaged when completing Montessori activities. Orsulic-Jeras et al. (2000) also measured resident passive engagement which was defined as the looking or listening behaviour that was exhibited by the client in response to the activities being conducted. The results revealed that Montessori-based activities resulted in a decrease in passive engagement. However, it was noted that the Montessori activities were usually completed in groups of three to seven. Meanwhile, the control group received their activities in groups as large as 20. This leads to the question of whether the Montessori program was more effective due to having less participants in each activity. In a complementary study Jarrott, Gozali, and Gigliotti (2008) compared Montessori-based and traditional activities at an adult day care centre with a group of ten patients. Similar to the previous study, the activities were completed in small groups in order to increase social interactions between clients and to emulate the normal staff-to-client ratios. It was found that the patients who participated in the Montessori activities remained significantly engaged for approximately two minutes longer than when they participated in the traditional activities. However, it was again noted whether the results would have been the same if the intervention was completed in larger sized groups.

In another study, Montessori activities were used to determine if these methods were effective in slowing down cognitive decline in 14 adults with Alzheimer’s disease (Vance & Johns, 2003). Using a within-subjects design, participants engaged in Montessori activities for three months, followed by three months of traditional activities. Montessori methods consisted of activities such as knitting, taking care of a doll baby, and screwing nuts and bolts together. These activities were chosen as they were all activities that were personalized to residents on the unit. Meanwhile, traditional activities consisted of activities including arts and crafts and watching television. According to Vance and Johns scores in the Montessori condition were significantly favourable with scales that measured participant cognition, social behaviour, attention, memory, and concept). In other words task-engagement, which was the length of time the individual participated in the task, increased during Montessori activities. Still, it was not noted whether
engagement increased in the participant’s life overall through a period of time, or only when completing the Montessori activity.

Corroborating these results, Judge, Camp and Orsulic-Jeras (2000) examined the use of Montessori-based activities with persons with dementia attending an adult day care center. During a nine-month period, individuals with dementia were assigned to receive either Montessori-based activities or a control group where regular activities occurred. Examples of Montessori activities included memory bingo, intergenerational programming, and reading. Regular activities were groups such as art therapy, exercise programs, or movies. Judge et al. observed four different categories of engagement, constructive, passive, non-engagement, and self-engagement. The results demonstrated that the participants who took part in the Montessori-based activities group exhibited lower amounts of passive engagement and higher amounts of constructive engagement than individuals in the control group.

Overall, in the research reviewed, Montessori methods have demonstrated to be successful in increasing positive behaviour such as engagement and participation in individuals who have dementia and are attending adult day centers.

**Long Term Care Facilities.** As dementia progresses, symptoms often become unmanageable and the individual often ends up in a LTCF (Kocach & Magliocco, 1998). Once placed in a LTCF individuals often show a decrease in participating and engaging in activities. Kocach and Magliocco (1998) investigated the behaviour and participation of people who had late-stage dementia and lived in a LTCF, during several activities. That study revealed that on average participants were only actively participating in activities for 10 minutes or less. It was also discovered that active participation was significantly higher when the person with dementia had more senses stimulated. It was thought that people with dementia engage in disruptive behaviours such as hitting, or yelling due to boredom (Chow et al., 2012). As a result, individuals with dementia should be encouraged to attend and engage in activities due to the fact that completing activities may help give these individuals a sense of meaning (Dreher, 1997). Therefore, appropriate and evidence-based interventions are necessary in order to help individuals with dementia live the rest of their life with dignity, respect and meaning (Gitlin et al., 2009). Camp stated that Montessori Methods have been effective in increasing engagement and participation in dementia patients residing in LTCF (Elliot, 2012).

Schneider and Camp (2003) evaluated the effects of implementing Montessori activities through pairing LTCF visitors with individuals who have dementia. In the study nine pairs of visitor and resident were observed. The visitors consisted of family members or friends of the individuals with dementia who were not previously trained in the use of Montessori activity. Montessori activities were tailored to the individuals who had dementia. For example, if a resident enjoyed scrapbooking when she was younger than her Montessori activity may have consisted of making a scrapbook. Task engagement was measured through documenting the length of time the client was engaged in the activity. According to Schneider and Camp, this study revealed an increase of 40% in task engagement when Montessori activities were being used, compared to when Montessori activities were not used. In other words, the individual with dementia would participate in the Montessori activity for a longer duration of time as compared to other activities such as watching television. However, it was noted that visitors had to be willing to use learn to use Montessori methods for this activity to work. In other words, the
visitor had to attend the training sessions on implementing Montessori methods. In order to implement Montessori methods, the visitor must have known what tasks the individual with dementia enjoyed, and have been able to tailor these activities to the individual. In consequence, the success of the results of this study would not occur if the visitors were not motivated to learn to successfully implement Montessori activities.

Lin et al. (2009) examined the effectiveness of using Montessori-based activities and acupressure to decrease agitated behaviours in residents who had dementia and were living in a LTCF. The study compared three treatment methods which consisted of an acupressure condition, Montessori methods condition, and a control condition. In the acupressure condition, the participants received acupressure from a registered therapist. Meanwhile, participants in the Montessori condition received engaging activities that had been individualized to them. Examples of Montessori methods were not provided, but are thought to have been similar as the activities defined in the previous studies (e.g., knitting, or scrapbooking). The control condition consisted of the participants engaging in activities as normal. One hundred thirty-three residents were chosen and randomly put into one of three different treatment sequences. In each treatment sequence the residents received all three treatments; however the treatments were received in varying order depending on the sequence they were assigned. The first treatment sequence consisted of receiving first the acupressure condition, followed by the control condition, and then the Montessori methods condition. Residents in the second treatment sequence first received the Montessori methods condition, followed by the acupressure condition, and then the control condition. Residents who were randomly assigned to the third treatment sequence received the control condition, then the Montessori methods condition, followed by the acupressure condition. According to Lin et al. treatment was completed six days week for a period of four weeks. Results revealed that the use of both the Montessori methods and acupressure was successful in decreasing anxiety in individuals with dementia. An increase in engagement was also shown in the Montessori methods compared to the control condition. This increase in engagement may be due to fact that the activities in the Montessori condition were individualized to the resident.

Van Der Ploeg, Eppingstall, Camp, Runci and O'Connor (2014) used one-to-one Montessori programming to increase engagement and decrease agitation in 44 individuals with dementia, who lived in a LTCF. Ten of the participants were individuals who were consistently agitated and did not respond to activities. The other 34 participants were more settled and responded during the activities. Individuals were then either assigned to a control group or a Montessori group. Individuals who were in the Montessori group participated in one-to-one personalized activities. For example, one resident enjoyed gardening so her activities consisted of taking care of the plants within the LTCF. Further Montessori activities consisted of looking at and sorting pictures, singing to music, sorting dry pasta, arranging flowers, folding towels, screwing nuts and bolts together, planting seeds, and solving puzzles. Meanwhile, the control group consisted of normative activities that were frequently completed at the LTCF. Van Der Ploeg at al. found that agitated behaviours, such as pacing, decreased during both the Montessori and control condition, compared to those without any activities. Nevertheless, it was noted that while the 34 residents who often responded to activities showed large improvements across the conditions, the agitated behaviours continued to remain high in the group of individuals who rarely responded to activities. Therefore, it was found that neither the Montessori or control group decreased agitated behaviours in individuals who did not often respond to activities. Still,
it was discovered that the total length of time individuals spent engaged in activity doubled in the Montessori group, compared to the control group. It was found that both responders and non-responders showed an increase in engagement during the intervention.

Giroux, Robichaud, and Paradis (2010) evaluated the short-term effects of individuals with dementia participating in Montessori activities compared to regular activities. In this quasi-experimental study, 14 participants with dementia, living in a LTCF, were filmed during three conditions - the Montessori condition, the regular activities condition and the control condition which consisted of no activities. In the Montessori condition participants made associations with and handled different objects. Activities chosen involved cognitive, executive, sensory, and motor functions. Emphasis was placed on the realization of the activity, not the success. Examples of the Montessori activities were screwing nuts and bolts, arranging pasta, and completing puzzles. Meanwhile, regular activities were bingo, group programming, and watching television. This study demonstrated that participation and engagement in activities increased significantly during the Montessori condition, compared to the control condition.

Camp et al. (1997) completed a study using intergenerational programming (IGP). IGP consisted of one-on-one interactions between 12 individuals with dementia who were over the age of 65 and 14 children in pre-school. In the study, the individuals with dementia would teach the children to complete a task. The results indicated that individuals who have dementia and have the appropriate setting can still serve as effective mentors to children. Additionally, it was found that positive levels of engagement increased in the individuals with dementia. In a similar study, Lee, Camp, and Malone (2007) used IGP with 14 nursing home residents of a dementia unit. As in the study by Camp et al. (1997) the 14 nursing home residents were paired up with 15 preschool children in one-to-one IGP. Lee et al. explained that the individuals with dementia were able to teach the children using Montessori-based activities. A scale was used in order to measure the total amount of time the individuals with dementia exhibited negative and positive forms of engagement. As in the study by Camp et al. (1997), the results of this study also revealed that participation in the IGP was correlated with increased levels of positive engagement and a decreased level of negative engagement for the individuals with dementia. This increased levels of engagement may be due to the fact that the individuals with dementia found teaching to give their daily life purpose. While IGP therapy was successful, it may be difficult and time consuming to organize weekly times and activities for children to come to visit the LTCF.

Four people who had been diagnosed with early-stage dementia were taught to work as leaders, for the purpose of a small-group activity (Camp & Skrajner, 2004). These four leaders were paired with nine individuals who had late-stage dementia. According to Camp and Skrajner, this process is known as Resident-Assisted Montessori Programming (RAMP). The purpose of this study was to increase positive levels of engagement. Results demonstrated that RAMP increases participant positive engagement while also providing social stimulation for the leaders. In a related study by Camp and Skrajner (2007) six individuals who were in the early or middle stages of dementia were trained to teach a reading group to 22 individuals who had advanced dementia. Results revealed that individuals with early or middle stages of dementia can lead groups if the proper prerequisites, such as easy instructions and materials, are met. It was also revealed that the individuals with late stages of dementia in the reading group, showed an
increase in positive engagement in the reading group as compared to when they completed regular activities.

Wu and Lin (2013) used a combination of spaced retrieval (SR) and Montessori activities to increase nutrition and eating in patients with dementia living in LTCF. SR is a technique that was developed to use with individuals who have dementia to remember new information. SR is implemented by teaching participants to rehearse recalling information at gradually increasing intervals of time. The Montessori-based activities were related to eating, and consisted of activities such as pouring and scooping sand, matching items (e.g., earrings), and squeezing objects. This study was completed as a single-blind, quasi-experimental study that had repeated measures. Twenty-five participants received both SR and Montessori-based activities over a period of 24 sessions. Thirty-eight participants also received the SR and Montessori-based activities; however, these residents received more than 24 sessions depending on the total duration of their spaced retrieval intervals. Finally, 27 patients were in the control group and received routine care. This study demonstrated that participants in the SR and Montessori-based intervention group showed increased eating abilities and increased engagement during meal times. As well, participant body mass index was gradually increased over a period of time using SR combined with Montessori. The intervention groups also showed a decrease of depression symptoms.

In a subsequent study by Lin et al., (2010) spaced retrieval (SR) and Montessori-based activities were used to decrease eating difficulty in geriatric residents who had dementia. In this study 85 residents were chosen and were put in either a SR, Montessori activity, or control group during meal time. As stated previously, SR is a technique used to increase the amount of time of individual information recall. Participants in the spaced retrieval group had to recall eating procedures and eating behaviour using 1, 2, 4, 8, 16, and 32 minute time intervals. In the Montessori-based activity group, participants completed activities that consisted of scooping, hand-eye coordination, pouring, and squeezing. Meanwhile, the control group completed the activities usually provided on the unit. This study revealed that individuals who were in either the SR or Montessori groups had significant lower results on a feeding evaluation tool compared to people in the control group. Still, it was noted that individuals in the Montessori group needed more assistance during mealtimes compared to individuals in the SR group. This may be due to the fact that in the SR group the goal was to improve the individuals with dementia information recall. While, the goal of the Montessori group was to individualize mealtime to increase independence. This shows that while increasing individual with dementia independence is effective, increasing the length of memory recall is most effective.

Cohen-Mansfield and Werner (1997) used an enhanced environment to decrease pacing in 27 individuals with dementia living in a LTCF. Cohen-Mansfield and Werner decorated the facility corridors with either a nature or a family scene. In the nature scene, wall murals of trees and forests were hung around the room. In the family scene walls were decorated with pictures of families from the 1940s. These pictures were used to help make the individual feel more at home. Benches were added in the rooms to allow the individual to sit and stare at the pictures. This results of this study showed that enhancing the environment decreased both pacing and agitated behaviours in the individuals with dementia.
Montessori methods were used by Lin, Huang, Watson, Wu, and Lee (2011) to increase eating ability for individuals with dementia living in a LTCF. Twenty-nine residents with dementia from two LTCF were chosen. Residents were assigned either to a Montessori group or a control group. Individuals placed in the control group received regular unit activities. Meanwhile, individuals placed in the Montessori group completed activities that were focused on five domains: scooping, pouring, hand-eye coordination, and squeezing. Examples of Montessori activities were using a fork with holes to dig through sand to find objects, and scooping sand into a bin. After nine weeks, the individuals were assigned to the other group, that is, the individuals who were in the control group switched to the Montessori group and the Montessori group switched to the control group. The results of this study showed that there was a significant decrease of scores on a scale which measured difficulty during mealtime time in the Montessori intervention compared to the control group.

Zeisel et al. (2003) compared the associations between the special environmental features of nursing homes and the incidence of agitation, social withdrawal, depression, psychotic problems, and aggression among residents who had dementia. The associations between each of the seven environmental design feature and the behaviour of 427 residents who were residing in 15 dementia care units was measured. The seven environmental design features were: exit control (whether exit doors were camouflaged); walking paths (whether walls were decorated with objects in order to attract residents); common space (privacy and individualized rooms); outdoor freedom (if residents could spend time in an open space/garden); residential character (whether the unit used residential furnishing); autonomy support (whether physical supports, such as handrails, were in place for residents) and; sensory comprehension (whether staff could control visual and auditory noise within the dementia care unit. The results revealed that behaviours such as agitation, social withdrawal, depression, psychotic problems, and aggression decreased when the environmental designs were modified to the individual. According to Zeisel et al. the individual would often participate in activities for longer periods of time when they were in the modified home. This study demonstrated the potential that the environment has on decreasing negative symptoms in people who have dementia. However, a limitation to the study is the cost of renovating and building nursing homes with the special designs used for the purposes of this research. While the environmental designs used in this study were effective, personalizing an individual with dementias living space can be completed of a cost effective budget.

In conclusion, multiple studies have been completed on the use of Montessori-based activities to increase the engagement of individuals with dementia, who were living in LTCFs. The literature has revealed that Montessori activities are often successful in increasing engagement in individuals with dementia in a wide variety of activities, including independent eating.
Montessori Methods at Home

Individuals who have dementia are often cared for in their home by an adult child or their spouse (Baumgarten et al., 1992). Caregivers of people who have dementia usually experience great levels of stress. Baumgarten et al. (1992) found that caregivers of individuals with dementia had significantly higher levels of physical symptoms (e.g., back pain, increased colds) and depression, compared to non-caregivers. This stress often leads to the individual with dementia being placed in a group home. Subsequently, at home interventions are needed in order to increase independent functioning of individuals with dementia, as well as to decrease caregiver stress.

Maintaining functional independence is considered a high priority for many geriatric individuals, including those with dementia (Rogers & Mynatt, 2003). Rogers and Mynatt (2003) declared that continuing to live at home, also known as independent living, helps promote independent behaviour in individuals with dementia. In recent years environmental supports, which can be defined as changing the environment to support the individual (Gross et al., 2004) have been used to assist independent living. Environmental supports are part of the prepared environment component in Montessori activities and can help to reduce caregiver stress by increasing the independence of the individual with dementia.

Computer aids are a form of environmental supports used to maintain individual independence. Rogers and Mynatt (2003) are currently developing computer systems that will be used to maintain individual independence in the future. In a study where they explain the use of this technology, Rogers and Mynatt provided examples of the possibilities of these computer systems in the near future. In one illustrative example provided, a client was diagnosed with dementia and engaged in wandering behaviour. With the futuristic technology being created, whenever the client engages in wandering behaviour and attempts to leave the house a siren will activate. The technology will provide the client’s caregiver with the ability to lock the door using voice activation, when they say “latch the door”. The use of this technology would in turn reduce caregiver stress and increase the independence levels of the client. While this study demonstrated future possibilities, the technology has not been used at present time. This paper was only an example of technological environmental supports that will be used to help individuals with dementia living at home in the future. Also, it is hypothesized that these advanced computer systems will be very expensive to install in the homes of people diagnosed with dementia. This leads to the question of whether the government will provide funding so that every individual with dementia will have access to this computer technology where they are residing.

Gitlin, Corcoran, Winter, and Boyce (2001) observed the effects of an in-home environmental intervention on the functioning of individuals with dementia and the stress levels of caregivers. One hundred and seventy-one patients with dementia and their families were assigned into either an intervention group, where they received environmental interventions, or a control group, where they received care as usual. The intervention group received five 90-minute at home visits by therapists who provided education on social and physical environmental modifications. Therapists helped caregivers remove clutter and break down the tasks asked of the individual with dementia (e.g., one or two-step commands). Meanwhile, occupational therapists helped the caregivers by providing education about excess stimulation and behavioural disturbances (e.g., agitation) in people with dementia. Results revealed that patients’ daily living activities were maintained and did not decrease in the treatment group. Meanwhile, in the control
group the daily living activity skills were found to have decreased. Results also showed that
caregiver stress was lower in the treatment group compared to the control group. These results
help demonstrate that Montessori activities can be used to increase independence in individuals
with dementia and decrease caregiver stress. Still, it was noted that while in the treatment group
the patients’ daily living activities were maintained, the daily living scores did not demonstrate
an improvement. This shows that while participant independence was maintained, it was not
successfully increased.

Giovannetti et al. (2007) examined whether environmental supports could demonstrate an
improvement in everyday tasks with people who have dementia. Forty-six individuals with
dementia who were living at home completed a test which measured individual everyday action
impairment. This test requires the individual to complete three everyday tasks. These tasks were
completed under a control condition, and a condition in which the environment was modified.
The modified environment was referred to as the user centered condition. Unlike the study by
Gitlin et al. (2001), the only environmental supports in the user centered condition consisted of
the necessary objects being arranged by order of task and the use of a visual cue. This study
revealed that the user centered condition increased individual independence and performance in
the everyday tasks. This study also demonstrated reduced error rates in individuals with
dementia.

In conclusion, more studies should be completed on the use of Montessori Methods to
increase individuals with dementia independence, and decrease caregiver stress. Nevertheless,
the current literature published on this subject demonstrates that environmental supports are
effective in decreasing stress and increasing independence.
Training all Staff in Montessori Methods

While, currently activity and recreation staff members are the main users of Montessori Methods, professionals have recommended that all staff members who are working at long-term care facilities be trained in Montessori Methods (Elliot, 2012). It has been found that having multiple staff members trained to implement Montessori methods decreases the negative symptoms of dementia in residents (Elliot, 2012). This includes staff members from multiple different areas of work such as office administration workers, cleaners, nutritionists, nurses, personal support workers, and doctors.

A hospital in Toronto trained nurses and doctors to properly implement Montessori Methods with individuals who have dementia during emergency room visits (Clarke, 2013). Individuals who have dementia are often very stressed and anxious during visits to the hospital emergency room, which often results in these individuals being sedated in order to reduce levels of agitation and aggressive behaviours. Recently, Montessori-based activities have been demonstrated to be effective in decreasing agitation and increasing calmness in individuals with dementia who are admitted to the emergency room. In an example presented, an 88-year old man with dementia had been admitted to the emergency room. At intake the patient was distressed and engaging in agitated behaviours such as yelling and trying to climb off his stretcher. Staff members of the hospital brought Montessori activities, including coloured clothespins and plastic buckets, for this man to complete. This activity helped to reduce the agitation levels of the patient. Also, it was found that the patient was actively engaged in the Montessori-based activity for 40 minutes. It has been noted that the hospital setting is different than the setting of a LTCF. However, this study can be useful in demonstrating the effectiveness of Montessori methods across settings. Also, this study helped demonstrate that training nurses and doctors Montessori activities can be beneficial to the agency and residents.

Skrajner, Malone, Camp, McGowan and Gorzelle (2007) implemented MMFD with 78 people with dementia, in long-term care facilities, assisted living facilities, and adult day programs. The goal of this research study was to increase positive engagement in patients with dementia. Multiple staff members at the agency including staff in areas such as activities, rehabilitation, direct care staff, administration and social work, were trained to use Montessori methods. According to Skrajner et al. researchers observed the participants during activity time before the staff received Montessori training, and after they were trained. The training of agency staff in Montessori methods resulted in increased positive engagement by participants. The study also demonstrated that it is possible to train multiple staff members from different areas of work in the use of Montessori methods. Staff members reported feelings of satisfaction over the training of implementing Montessori methods. However, training was lengthy due to the many staff members working at the agency, and therefore it may be difficult for agencies to assign periods of time for all staff members to be trained to use Montessori methods.

A study by Reimer, Slaughter, Donaldson, Currie and Eliasziw (2004) compared the effectiveness of a specialized care facility (SCF) to a traditional LTCF on the quality of life for individuals who have middle-to-late stage dementia. Of the 185 residents, 62 were in the SCF group while the other 123 were in the traditional LTCF. The SCF was a facility with 60 beds which had 10 people living in six bungalows. This home was built with an enhanced environment and used Montessori practices. For example, decorations were uniquely designed
with each individual in mind to give a more home-like feeling. Reimer et al. stated that all staff members working in the home were also trained extensively to implement Montessori methods. Results revealed that the participants in the SCF group showed less decline in activities of daily living such as, eating and dressing oneself. Also, it was found that those living in the SCF had higher levels of interest and engagement in their environment. The results demonstrated that in hospitals that have all staff members trained in MMFD, an increase in positive symptoms and a decrease in negative symptoms can be attained.

The literature reviewed demonstrated that when staff in settings such as LTCF and hospitals are trained in the Montessori approach to care of dementia patients there is a decrease in symptoms, such as passive engagement, depression, and social withdrawal. It has been found that training multiple staff members in Montessori methods is beneficial across settings such as in hospital emergency rooms and long term care facilities. Still, it has been found that training multiple staff members to implement Montessori methods can be a costly and time consuming process. It may be useful to train one staff member from each agency department and then allow that staff member to train the rest of their department themselves. Also, it is noted that limited studies have been completed on the training of multiple staff members from a variety of specialties to implement Montessori methods. As a result, more studies should be conducted on the Montessori method as a viable approach to the treatment of dementia.

This literature review chapter supported the research question, and demonstrated that Montessori methods are effective at maintaining the cognitive abilities of individuals with dementia. Montessori methods were demonstrated to be effective in multiple settings including, long-term care facilities, adult day centres, and at the individuals home. Still, it was noted that even with the use of Montessori methods cognitive abilities of people with dementia will decrease over time. Overall, the literature review chapter was a brief summary of the multiple studies completed on the use of Montessori methods with individuals who have dementia, and will provide quick information to people working with this population and are interested in using Montessori methods.
Chapter III: Method

A search of the literature used for the completion of this paper was gathered through the EBSCOhost databases accessible at St. Lawrence College, Kingston, Ontario, (CINAHL with full text, ERIC, MEDLINE, PSYCArticles, PSYCBooks, and PSYCinfo). Literature was also collected through the database at Queen’s University in Kingston, Ontario (PSYCArticles, PSYCBooks, PSYCinfo) and the database at Carleton University in Ottawa, Ontario (PSYCArticles, PSYCBooks, Family & Society Studies Worldwide, BioMed Central, ScienceDirect Journals, Public Health Agency of Canada: Periodicals and Serials, Canadian Health Research Collection-Trial). In addition, a recreational staff member at the agency provided 13 peer reviewed articles (Clinical Gerontologist, International Journal of Geriatric Psychiatry, Clinical Interventions in Aging), as well as a book entitled, Montessori Methods for Dementia, written by Elliot (2012).

Originally the key search terms used in all databases comprised of: dementia, Alzheimer’s, geriatrics, Montessori activities, programming activities, improving, lifestyle, and treatment. This search resulted in eight articles used for the thesis proposal. However, due to the initial limited search results, key terms were broadened for the purpose of this paper and included, education, supportive environment, environmental supports, independent living, caregiver stress, and programming activities.

Articles were used if they included full-text and were relevant to the adaption of Montessori Methods for Dementia (MMFD), increasing engagement and participation in adult day centers and LTCF, caregiver stress, individual independence, and professionals being trained in MMFD. If one of the articles used included relevant information from a secondary source, then a search for the original article was conducted. Relevant information consisted of information that could be used as research in any of the five components in the literature review. Searches for secondary articles were completed by finding the name of the secondary article(s) from the reference list of the original article, and searching the secondary article title on Google Scholar ©. Secondary sources were also found in the reference list of the book, Montessori Methods for Dementia, and the titles of these secondary sources were searched for using Google Scholar©. In total, 57 articles were used for the literature review. Of these articles, 23 were used for the purpose of empirical evidence which can be seen in Appendix A. The remaining articles were used for the purpose of general information.

Selected articles focused on Montessori-based activities with individuals who have dementia. The articles reviewed during the writing of this literature review comprised of settings in a variety of locations, including but not limited to aged-care facilities, and the homes of the client, family, or friends, as long as Montessori-based activities were being utilized with the client. The research articles were published in English, in a peer-reviewed journal, within the last 25 years. Originally a 10-year range was chosen as the timeline for these articles; however, it became evident that the range would have to be broadened in order to generate enough peer reviewed articles. Consequently, a 25-year range was chosen as a search for criterion. The outcome measures accepted for inclusion in this review consisted of any outcome: successful or unsuccessful. Comparisons were made based on the methodology and results of the studies. Articles that were thought to be directly applicable to the agency for empirical purposes were outlined and summarized in a table.
The results section was completed through briefly summarizing the main findings of the literature review chapter. Main findings were determined through the results that were most commonly seen within the articles reviewed. Similarly to the literature review chapter, the results chapter was divided into five sections: dementia and the need for treatment; Montessori methods used with dementia; Montessori methods in adult day care centers and long-term care facilities; Montessori methods at home; and training all staff members in Montessori methods.
Chapter IV: Results

The goal of this thesis was to examine the literature on the use of Montessori methods in the treatment of individuals with dementia, in order to demonstrate whether Montessori methods were effective in maintain cognitive abilities in this population. A study of the literature on the of Montessori methods in treating patients with dementia supported the research question, and showed conclusively that using the Montessori method generally resulted in the best overall quality of life for both patients with dementia and their caregivers. The results of this study were used in order to provide recommendations to any long-term care facilities on the types of Montessori activities that may be used with residents.

The section that follows outlines the data that were accumulated during the completion of the literature review, calling attention to the key themes and findings. The data are presented to demonstrate essential ideas and findings, while following the layout of the literature review. Information is provided on the need for treatment of dementia, the adaption of Montessori methods for dementia, the use of Montessori methods in adult day centers and long-term care facilities, the use of Montessori methods at home, and the rationale for supporting the idea that all staff members should be trained in Montessori methods in order to maximize positive the effects.

Dementia and the Need for Treatment

In regards to dementia and the need for treatment, the literature demonstrated that the diagnosis of dementia is increasing as a result of the longer life spans of humans. While estimates for increasing prevalence were presented, not all researchers agreed on the definite amount of individuals who will be diagnosed with dementia in the future. However, the majority of experts agreed that dementia is a disorder which leads to significant losses in cognitive abilities such as memory and speech. The literature indicated that while there is no cure for dementia; treatments to improve the quality of life in individuals with dementia are available.

Montessori Methods used with Dementia

The research reviewed proposed that there are similarities in the way children and individuals with dementia learn. In the early 1900s, Maria Montessori created the Montessori methods to help children learn through the exploration of the environment. The literature established that Montessori methods should be tailored to the individual, for maximal effectiveness. Around 1983 Camp, who was working with individuals who had dementia, recognized that the Montessori techniques would be advantageous to use with individuals with dementia. According to some experts, children’s minds are developing, while the mind of an individual with dementia is degenerating. Therefore, as seen in the literature, the use of Montessori methods supports both groups in learning to the best of their abilities.

Montessori Methods in Adult Day Care Centers and Long-Term Care Facilities

The literature revealed that utilizing Montessori methods in adult day centers generally led to positive effects on the behaviour of individuals with dementia. In most of the studies reviewed, participant positive engagement was increased through the use of Montessori methods. An increased display of participant engagement was indicated in a study by Orsulic-Jeras, Judge,
and Camp (2000), where positive levels of engagement were increased through the use of Montessori methods. The literature on the use of Montessori methods in long-term care facilities (LTCF) demonstrated mostly positive effects on the behaviour of individuals with dementia. Many researchers agree that individuals with dementia, who live in LTCF, do not receive enough mental stimulation. The reviewed literature revealed that individuals living in a LTCF with dementia spend on average 10 minutes or less engaged in activities. In the majority of studies reviewed, Montessori methods successfully increased positive level of participant engagement, while decreasing negative participant engagement. The literature also demonstrated that Montessori methods can be used to decrease anxiety levels, and increase eating ability in people diagnosed with dementia. Nonetheless, it was noted that spaced retrieval was more successful in increasing the independent eating ability of people with dementia as compared to the Montessori methods (Lin et al., 2010).

Montessori Methods at Home

It was found in the literature that individuals who take care of loved ones with dementia at home often exhibit more signs of stress and depression. These symptoms of stress and depression in the caregiver may result in the person with dementia being placed in a LTCF. In regards to Montessori methods at home, the literature establishes that Montessori methods can decrease caregiver stress while increasing participant level of independence. Nevertheless, it was noted that more studies need to be completed on the use of Montessori methods at home.

Training all Staff in Montessori Methods

The literature showed that more staff members should be trained in the use of Montessori methods. According to some experts, recreational staff are the main organizational staff members trained in Montessori methods. Still, the literature revealed that training other staff members, such as nurses, personal support workers, and doctors in the use of Montessori methods results in beneficial outcomes for the patients with dementia.

These themes observed throughout the literature review are inspected in greater depth within the discussion section, where the inferences and implications are shown in consideration to the quantitative data (Appendix A) gathered in the literature review.
Chapter V: Discussion

The upcoming section discusses the findings and implications of the results of the literature review. The thesis strengths and limitations are discussed from a multi-level systems’ perspective, with a focus on the creation of an academic project based on the client, the program, and societal levels. In the application to the Behavioural Psychology section, contributions of the thesis to the Behavioural Psychology field are examined. Lastly, in the suggestions and recommendations section, recommendations for future research and projects are presented.

Implications of Results

Dementia is a disease that currently affects thousands of people worldwide and this number is expected to increase substantially in the upcoming years because of aging baby boomers who dominate the current population of Canada. Though there is currently no cure for dementia, interventions need to be completed on individuals with dementia, to both improve quality of life and reduce symptoms of dementia. In the current Results section, Montessori methods were shown to be effective in increasing positive engagement in individuals with dementia, as well as decreasing caregiver stress. From these results, it was inferred that Montessori methods should be used as a primary intervention method in the treatment of individuals with dementia.

This literature review included an examination of multiple research studies summarized in Appendix A. As a result, this study can be used as a basis for empirical research into the efficacy of Montessori methods as a treatment tool. The results of this thesis also show that other specialists or caregivers should consider using Montessori methods more frequently as an adjunct to the treatment of individuals who have dementia. Therefore, the government should provide increased funding for these purposes, so that adequate services can be provided as the need for such services grows. Using Montessori methods seems to show that the quality of life for both patients and caregivers improves considerably, with the possibility of reducing overall costs to the system in the long term. Costs may be reduced to the system through the use of Montessori methods, as individuals with dementia may be able to function independently for a longer duration of time.

Strengths and Limitations

Strengths. One strength of the thesis is the methodology which was used to gather articles and information. Any individual who is reading this literature review can see the definitions of terms, instruments, and methods used in the review. This method of gathering and presenting data provides an easy reference to all of the literature that was reviewed for this study but not necessarily included in the writing of the literature review section.

Another major strength of this literature review is that it provides more in-depth information relevant to both professionals and agencies concerned with dementia. In the Results section, it was demonstrated that individuals with dementia exhibit higher levels of positive reactions when all members of an agency are trained to implement Montessori methods. This leads to the question of whether it should be mandatory for all staff members in a dementia unit or service be trained to properly implement Montessori methods.
Additionally, the findings of this study can be extrapolated to a larger study, as the methodology for multiple studies was provided. As an example of an untested area, additional research could be completed on service providers who work with individuals still living in their homes, an obvious cost-saving measure to the health care system.

This research paper also provides staff members who work in a similar service, with a summary of Montessori methods. Using this literature review staff can review the use of Montessori methods to determine whether any of these methods could work with their own clients.

**Limitations.** One major limitation of this literature review is that it was restricted to only five main research areas: (1) dementia and the need for treatment; (2) Montessori methods adapted to use with individuals who have dementia; (3) Montessori methods in adult day care centers and long-term care facilities; (4) Montessori methods at home; and (5) training all staff in Montessori methods. This was a limitation due to the fact that there are other research areas, such as the use of Montessori methods to increase social skills, which may also be of interest to other researchers examining the use of Montessori methods with people who have dementia.

Another limitation is that the present data on the use of Montessori methods is limited. As a result, the majority of the research that was analyzed focused on the use of Montessori methods in long-term care facilities and adult day centers, not in peoples’ homes. Nor was there any research on the benefits of training all staff members in an agency to implement Montessori methods. Having more recent articles, as well as a full and complete analyses covering all areas of interest to researchers would improve the validity of the effectiveness of Montessori methods at a practical level.

Finally, a limitation of this thesis is the fact that it was an overview of the studies of other researchers, and no clinical data. Therefore, none of the clients that the author worked with took part in a study that compared Montessori methods to regular unit activities. As well, while the review gives examples of Montessori activities, the review did not provide a tool that a caregiver could use to decide which Montessori method would work best with each specific client. This may result in ethical issues of implementing any of the Montessori methods.

**Application to the Behavioural Psychology Field**

This thesis contributed to the Behavioural Psychology field by demonstrating that Montessori methods are effective to use with people who have dementia. Through knowing what types of interventions to use, professionals can help to increase levels of positive engagement in individuals who have dementia. As previously stated, the prevalence of dementia is increasing. Therefore, it is crucial that professionals understand the types of interventions to use with people who have dementia.

**Suggestions and Recommendations**

Firstly, it is recommended that further research be completed on the use of Montessori methods as a key methodology in the treatment of individuals with dementia. This further research will give practitioners, and individuals in the Behavioural Psychology field, the opportunity to base interventions on peer reviewed journals and research. Additionally, more
research will provide clients an opportunity to increase levels of independence, and maintain their cognitive abilities for longer durations of time.

Secondly, it is recommended that Montessori methods be utilized in both adult day care centers and long-term care facilities. It is suggested that currently used activities completed with individuals who have dementia, such as trivia or cards, be replaced with Montessori methods, which are individualized to each individual. For example, if a woman enjoyed taking care of children in her youth, a Montessori activity might consist of dressing a toy baby. This would result in more individualized programs, which may increase the interest of clients with dementia. Having more Montessori activities may also reduce the stress of workers at adult day centers and long-term care facilities, since individuals with dementia may show an increased independence and positive task engagement.

Also, this literature review brings awareness to specialists in the Behavioural Psychology field and other related fields that a treatment method does exist to improve the quality of life of an individual with dementia. Knowing that gains in ability are possible in individuals with dementia through the use of Montessori methods, may result in Montessori methods becoming more widely used.

Furthermore, it is also strongly recommended that, where possible, Montessori methods be implemented in the homes of individuals with dementia. As a result, caregivers of these individuals should be given lessons on Montessori methods so that they can implement the strategies in their homes. Implementing Montessori methods at home, may help individuals gain more independence, thus delaying the need to be placed into a long-term care facility.

Finally, it is recommended that all staff members be trained in Montessori methods, whether in a long-term care facility or some other care capacity. These staff members include doctors, nurses, personal support workers, kitchen staff, as well as cleaning staff. It is also suggested that once Montessori methods become the basis of treatment by staff that ongoing research be completed to examine the effectiveness of the training for the staff, so that training procedures can be improved upon in the future.

**Recommendations for Future Research.** It is recommended that future research delve into the application of the Montessori method in a home-care situation. Studies should be completed on the effectiveness of caregivers implementing Montessori methods, and on the effectiveness of the training of these caregiver. Additionally, the training of staff members who implement these programs should be assessed during future research. It is also recommended by the author that these programs be assessed on their success and/or failure rates. Also, as previously stated, more data should be collected on the use of Montessori methods in people with dementia living in adult day care centers and long-term care facilities. Finally, it is suggested that future research examine the funding issues in regards to changing this system, if Montessori methods were to become the therapy of choice for individuals with dementia.
References


Appendices

Appendix A: Method – Summarized Articles

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<tr>
<th>Author/Title</th>
<th>Method</th>
<th>Results</th>
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<tr>
<td>Byun, W., Blair, S. N., &amp; Pate, R. R. (2013). Objectively measured sedentary behaviour in preschool children: Comparison between Montessori and traditional preschools. <em>International Journal of Behavioural Nutrition &amp; Physical Activity, 10</em>(1), 1-7. doi:10.1186/1479-5868-10-2</td>
<td>Individuals in this study consisted of preschool children who were 4 years old. Participants were enrolled in either one of eight traditional or nine Montessori preschools. The number of participants in each traditional preschool ranged from 21 to 33 in the traditional preschools, and 19 to 62 in the Montessori preschools. Sedentary behaviour was measured through the use of accelerometers. Data were collected in-school, out of school, and during the total length of day. Accelerometers were used to collect data according to the frequency and intensity of movement. Participants wore accelerometers on their hip from waking up until bed time. The accelerometers were initialized to collect data during 15-second intervals. Cutpoints were set to the data in order to pinpoint the total time spent in sedentary behaviour. A cutpoint of &lt; 200 counts/15 seconds was used to define sedentary behaviour. A cross-sectional study design was used. Data collectors were trained to record each participant’s arrival and departure time from school each day. This was completed in order to distinguish between in-school and out of school sedentary behaviour. Data mean, standard deviation, frequency, and percentage were calculated according to the total amount of activity monitored throughout the day. Chi-square tests and independent sample t-tests were used in order to conclude results on the differences in demographic and anthropometric variables between the</td>
<td>It was determined that children who attended the Montessori preschools were predominantly white, and had parents with higher education levels compared to children in the traditional preschools. It was also discovered that children who attended the Montessori preschools had decreased body mass index scores, and participated more often in organized sports. Total variances in sedentary behaviour were 48%, 22%, and 34% for in-school, after-school, and total-day, respectively. Adjustments were made for participant race, gender, body mass index, parent education level, and preschool setting. Results demonstrated that children who attended Montessori preschools spent less time in sedentary behaviour, compared to those who attended traditional preschools during the in-school period. It was also found that children in the Montessori preschools</td>
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The differences between sedentary behaviour in the traditional and Montessori preschools was determined through mixed linear regression models that included: age, gender, race, parent education level, accelerometer wear time (hours/day), body mass index, and preschool funding type (private or public) as covariates.

Individuals in this study consisted of 16 persons, 14 of whom were women, diagnosed with dementia. Participants resided in an advanced dementia unit, inside a long term care facility. The participants’ Mini-Mental State Examination scores ranged from 0 to 19, indicating severe dementia. Participant ages ranged from 79 to 94.

The Menorah Park Engagement Scale was developed to measure four types of participant engagement during the study. Constructive engagement (CE) was defined as any behaviour, either verbal or motor, exhibited as a response to the activity. Passive engagement (PE) was defined as looking or listening behaviour in response to the activity. Non-engagement (NE) was defined as staring into space for longer than 10 seconds. Meanwhile, self-engagement (SE) was defined as any purposeless behaviour the individual engaged in involving themselves.

Affect was measured using the Apparent Affect Rating Scale (AARS), which measured participant pleasure, anxiety/fear, anger, and sadness.

Participants received both control activities (regular programming), and Montessori-based activities consisting of Memory Bingo, or Group Sorting. A within-subject design was used, and each

A 2 x 2 repeated measures analysis of variance (ANOVA) representing the within-subject factor, was used to assess results.

For CE a significant main effect was found, $F(1, 15) = 102; p < .001$ for the Treatment Factor. Therefore, CE was demonstrated more in the Montessori programming then in the regular programming.

In PE a significant main effect was demonstrated, $F(1, 15) = 5.5; p < .03$ for the Treatment Factor. Consequently, PE decreased during the Montessori programming, compared to the regular activities programming.

NE and SE were rarely seen during the activity observation periods. Nevertheless, when observed, it was always during regular programming and never
subject served as his or her own control. Participants received intervention programming twice a week, for 15 to 30 minute durations.

Regular activities programming was used as the control condition. During regular programming, large group activities (n = 10 to 20) consisted of trivia, storytelling, current events, or exercise. Small group activities (n = 3 to 10) consisted of aroma therapy, tai chi, and hand massage. Individual activities consisted of puzzles.

Memory Bingo was a small group activity (n = 3 to 7). During this activity, participants received four cards. Each card had a question on it, as well as an answer in response to a corresponding card. Participants each took turns reading the phrases and questions off their cards, and answering card questions.

Group Sorting was a small group activity (n = 3 to 5). In group sorting, a large board was place in front of the participants, with two categories on it (living or not living). The participants were each given pictures to sort into the categories (e.g., a person, or a chair).

Interobserver agreement data were collected during 25 intervention sessions, and was found to be over 95 percent.

For pleasure, a significant main effect was found for Treatment, F (1, 15) = 62.3; p < .001, and for Time, F (1, 15) = 6.7; p < .03. This demonstrated that participants experienced significantly increased levels of pleasure during Montessori programming than during regular unit programming.

For anxiety/fear, a significant main effect was found for Treatment F (1, 15) = 12.1; p < .003, and Time, F (1, 15) = 12.6; p < .003. These results showed that participant anxiety decreased in the Montessori programming compared to the regular activities programming.

Similar to NE and SE, anger and sadness were rarely observed in the participants. However, when anger or sadness were seen it was almost always during the traditional programming, and rarely during the Montessori-based programming.

Mean scores were calculated through each on the nine dependent variables (four engagement variables, 

| Jarrott, S., Gozali, T., & Gigliotti, C. (2008). Montessori programming for | Participants in this study consisted of 10 individuals, five men and five women, who had dementia. Each participant served as their own controls, and were observed both during the Montessori and | in the Montessori programming.
For pleasure, a significant main effect was found for Treatment, F (1, 15) = 62.3; p < .001, and for Time, F (1, 15) = 6.7; p < .03. This demonstrated that participants experienced significantly increased levels of pleasure during Montessori programming than during regular unit programming.

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Similar to NE and SE, anger and sadness were rarely observed in the participants. However, when anger or sadness were seen it was almost always during the traditional programming, and rarely during the Montessori-based programming.

Mean scores were calculated through each on the nine dependent variables (four engagement variables,

| the traditional activities. Participant scores on the Mini-Mental State Examination ranged from 8 to 26, which indicated a wide range of cognitive impairments. Participant engagement and affect were measured. The Menorah Park Engagement Scale was used in order to measure the four most common types of engagement displayed by individuals with dementia. Constructive engagement (CE), passive engagement (PE), non-engagement (NE), and self-engagement (SE) (described above, in the study completed by Orsulic-Jeras, Judge, & Camp, 2000). Affect was assessed through the Apparent Affect Rating Scale (AARS). The AARS measured five emotions: pleasure, interest, anger, anxiety/fear, and sadness. Each emotion was rated on a five-point scale: 1 = never; 2 = < 16 seconds; 3 = 16–59 seconds; 4 = 1–2 minutes; and 5 = 2–5 minutes. Ten Montessori-based activities were completed during a 10-week period. Examples of Montessori-based activities were arranging flowers, mixing soil, and stringing beads. The ten participants were divided in three groups, and each Montessori activity was presented once a week to each group. Montessori activity programming lasted between 20 to 30 minutes. Data were collected during Montessori activities and in regular unit activities. Regular unit activities consisted of the normal programming usually completed on the unit. Examples of regular unit activities were trivia, or music. Observers collected data on each participant twice during each activity, for 10 minutes per person for each activity. |
|---|---|---|
| five affect variables). Anger was not exhibited during any activity. Therefore, it was excluded from the results. Paired sample t-tests were used to compare participants’ engagement and affect scores during both the Montessori and traditional activity contexts. Results revealed that the average amount of time participants were constructively engaged (CE) significantly increased during the Montessori programming (Mean of 4.18 of 5.0 possible minutes) compared to the traditional activities (3.38 minutes). It was found that PE did not change significantly from traditional (0.76 of the possible 5.0 minutes) to Montessori programming (0.69 of 5.0 minutes). Results also revealed that the average duration of time participants engaged in NE was significantly decreased in the Montessori-based activities (0.04 of the possible 5.0 minutes) compared to the |
Observers in this study achieved an interobserver reliability score of 95 percent.

Also, SE was decreased (0.02 of 5.0 minutes) during Montessori programming than traditional unit activities. (0.28 of 5.0 minutes).

Affect levels of positive (pleasure and interest) and negative emotion (anxiety/fear and sadness/depression) were similar in both the Montessori and traditional activities.

Interest was the most common affective state seen in both the traditional programming (M = 4.97 out of 5.0), and Montessori programming (M = 5.0 out of 5.0).

The effect sizes for both anxiety and pleasure were low to moderate (0.29 and 0.38) and large for interest and depression (0.86 and 0.91).


Participants in this study were recruited from two adult day centers. All participants met the criteria to be diagnosed with dementia. To participate in this study, individuals had to score 23 or lower on the Mini-Mental State Examination. Originally, 36 individuals took part in this study. However, 21 participants resigned from this study due to withdrawal from the day center, death, deteriorating condition, or hospitalization. The data were evaluated in two ways. Firstly, the raw scores were measured using paired t-tests and reflect status change, before and after each intervention. Also, differences in scores, based on the three months of traditional, followed by the three
The remaining participants received three months of traditional day center activities (e.g., arts and crafts, watching television), and three months of Montessori activities (e.g., taking care of a doll baby, knitting, and putting nuts and bolts together). Day centers were randomly selected in the order they received intervention (Montessori followed by traditional, or traditional followed by Montessori). Measures used to assess cognition were administered both before and after each type of intervention.

The measures administered before and after each intervention were: the Mini-Mental State Examination, the Dementia Rating Scale (DRS), the Digit Forward-Wechsler Memory Scale (DFWMS), the Block Design-Wechsler Intelligence Scale (BDWIS), the Wechsler Intelligence Scale Vocabulary Test (WISC-V), the Boston Naming Test (BNT), the Visual Discrimination Form (VDF), the Parachek Geriatric Behaviour Rating Scale (PGBRS), and the Ordinal Scales of Psychological Development-Modified (OSPD-M).

Staff members of the adult day centers were trained to administer the Montessori activities. The staff members were monitored during the entire study by the primary author (Vance).

Through the use of raw scores, before and after the Montessori condition, improvement of DRS attention and total DRS was shown. Therefore, the Montessori condition helped to improve participant attention.

Through the use of the differences in scores, which compared the disease progression rate between the two conditions, benefits were demonstrated in the Montessori condition in the total: OSPD-M scores, OSPD-M means end, OSPD-M object permanence, total DRS scores, DRS concept, DRS memory, DRS attention, Wechsler Memory Scale-Digit Forward, and the PGBRS-social behaviour scores.

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**Geriatrics, 19-33. doi: 10.1080/J148v20n03_02**


Participants consisted of 19 individuals who had dementia (11 women and 8 men). Participant Mini-Mental State Examination scores ranged from 7 to 24 (M = 17). The ages of the participants ranged from 60 to 101 years old. The participants were matched by their Mini-Mental State Examination scores and were assigned either to the treatment or the control group. The treatment group months of Montessori activities, were measured using paired-t tests and reflect dynamic change.

Participant rarely engaged in self-engagement and non-engagement. Data for constructive and passive engagement were measured using a 2 X 3 mixed-model ANOVAs that represented the between-groups factor.

Consisted of six women and three men, while the control group consisted of five men and five women.

Engagement was measured through the use of the Menorah Park Engagement Scale. The Menorah Park Engagement Scale measures the four most common types of engagement displayed by individuals with dementia. Constructive engagement (CE), passive engagement (PE), non-engagement (NE), and self-engagement (SE) (described above, in the study completed by Orsulic-Jeras, Judge, & Camp, 2000). Engagement was measured during 10-minute observation intervals, at baseline, post-test one, and post-test two.

Participants in the control condition received the regular day center activities. Regular programming was exercise programming, music programming or arts and crafts.

Intervention occurred twice a day, in the morning and the afternoon, for between 45 to 60 minutes. Research staff directly observed the intervention. Participants in the intervention group received both individual and group Montessori programming, after baseline measures were obtained. Group activities were either Question Asking Reading (QAR) or Memory Bingo. QAR was a small-group activity (n = 3 to 6) where the participants would read a story and answer questions about it. Meanwhile, in Memory Bingo, participants received four cards which had answers written on them, in response to corresponding calling cards. Each participant would take a turn reading the phrases or questions on the calling cards, and answering questions using one of their four cards.

“Group” (treatment vs control) and the within-subjects factor “Time” (baseline vs post-test one vs post-test two).

Significant effects were found in constructive engagement, for the Montessori group, [F(1, 17) = 14.8, p < .001] and Time, [F(2, 34) = 15.7, p < .001]. Also, the Group x Time interaction was significant, [F(2, 34) = 13.1, p < .001]. Therefore, constructive engagement increased in the Montessori condition compared to the control condition. A one-tailed independent t-test was used between the treatment and the control group. During baseline it found that the two groups were not significantly different from one another (p > .05), however, the groups were significantly different at both post-test one (p < .001) and post-test two (p < .001).

Significant main effects were found in passive engagement, for the Montessori group, [F(1, 17) = 4.7, p < .05] and Time, [F(2, 34) = 6.3, p < .005]. Also, the Group x Time interaction was significant, [F(2, 34) = 6.2, p < .005]. Therefore, passive
Individual programming consisted of two forms. Firstly, Intergenerational Programming where the individuals with dementia were mentors to young children and taught how to complete an activity, which was Montessori based. This activity was completed with individuals who had mild to moderate dementia. The other individual program was used with individuals who had severe dementia. This program was called individualized Montessori programming and consisted of tasks such as scooping or folding laundry.

engagement decreased in the Montessori programming, compared to the regular activity programming. A one-tailed independent t-test was used between the treatment and the control group. During baseline the two groups were not significantly different from one another (p > .05), however, the groups were significantly different at both post-test one (p < .01) and post-test two (p < .03).

Dependent t-tests were used on measures of constructive and passive engagement for participants in the Montessori-based programming and regular programming. Results of this comparison were significant for constructive engagement, [t (8)= 3.6, p < .004], however not for passive engagement, [p > .05].

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<th>Author/Title</th>
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<th>Results</th>
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<td>Kocach, C.R., &amp; Magliocco, J.S. (1998). Late-stage dementia and participation in therapeutic activities. <em>Applied Nurse Research, 11</em>(4), 168-73.</td>
<td>Twenty-three residents were selected from a 24-bed, late-stage special care unit inside of a nursing home. Participants who completed this study: (a) scored below a 10 on the Mini-Mental State Examination, (b) scored below a 55 on the Functional Behaviour Profile, (c) were unable to participate in group programming, and (d) had specified no cardiopulmonary resuscitation (NCR).</td>
<td>Results revealed that participants were able to frequently participate actively in activities for under 10 minutes. Participants actively participated for 10 to 19 minutes 21% of the time,</td>
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A descriptive exploratory design was used in this study. Participants were observed for six months, in various group and individual activities such as sensory experiences (aroma therapy, massage), cooking, exercise, pet therapy, music therapy, reminiscing, and spiritual activities (music, prayer). As the goal of this study was descriptive under natural conditions, no control condition was created.

This study was completed by nurses, nursing staff (i.e., personal support workers), and recreational staff. A data collector observed the participants and therapist every three minutes for the total length of the activity sessions. Activity sessions lasted for a minimum of 30 minutes.

Data were collected on the amount of active and passive engagement during each activity. In addition, data were collected on the type of prompting needed to get the residents to participate in the activities. Observers also collected data on whether resident needs were being met by caregivers.

Observations were made on the following: (a) the type of activity, (b) whether the activity was implemented in a group or individual format, (c) the total number of steps in the activity, (d) the number of senses that were stimulated by the activity, and (e) the total amount of minutes of "down time" (which was operationally defined as a nap or sensory calming experience) that took place before this activity.

Inferential and descriptive statistics were used in order to assess differences and relationships. Also, an analysis of the and only 4% of the time for over 20 minutes.

Results were similar for passive participation. Dozing and null behaviour did not occur often and when they did occur these behaviours lasted under 10 minutes. It was demonstrated that participants actively participated in spiritual and sensory experiences for the longest amount of time.

It was discovered that the number of participant senses that were stimulated during each activity, as well as the length of down time before each activity, was significantly related with the amount of minutes of active participation in activities. On average, two to five senses were stimulated when completing an activity. It was found that active participation was correlated with more stimulated senses. Results demonstrated that as the amount of down time increased, active participation decreased. The number of steps involved in each activity was not correlated with active participation. Also, there were no statistically significant differences in
individual’s body language, behaviour, verbalization, and facial expression was completed.

active participation between group and individual formats (t = 1.522, p = .132), or in whether the activity was implemented in the morning or afternoon (t = 0.494, p = .627).

It was found that even on a special care unit, therapists were not meeting resident needs for a large percentage of time (37.47%). Items in this category consisted of an individual calling out for help and not receiving assistance, or residents being unable to use equipment without staff assistance. Of all techniques used by the therapists, verbal cueing was used most often (19.64%). Verbal cueing combined with physical prompting was used for 12.32% of time. Also, verbal cueing that was combined with therapist demonstration was used for 12.04% of time. Finally, continuous verbal cueing and/or physical prompting was used during 11.25% of the time. It was also revealed that subjects would spontaneously participate in activities shown to them 7.82% of the time. It was demonstrated that participant often engaged in muscle relaxation in
| Schneider, N., & Camp, C. (2003). Use of Montessori-based activities by visitors of nursing home residents with dementia. *Clinical Gerontologist, 26*(1/2), 71-84. doi:10.1300/J018v26n01_07 | Participants originally consisted of 12 pairs of residents/visitors. However, one resident refused to participate, and another resident was unable to take part due to extreme agitation and attention deficits. Another resident participated in two treatment sessions before expiring. Therefore, only nine pairs (18 individuals in total) completed this study. All resident participants had dementia, and scored less than 10 on the Mini-Mental State Examination indicating severe cognitive impairment. Resident participants were selected from four care units at a long term care facility. Family members (visitors) were paired with, and implemented Montessori-based activities tailored to the individual, with their loved ones. Examples of Montessori methods may have been putting together scrapbooks, or polishing shoes. Engagement and Affect were measured.

The Menorah Park Engagement Scale was used to measure the four types of engagement most often displayed by individuals with dementia. Constructive engagement (CE), passive engagement (PE), non-engagement (NE), and self-engagement (SE) (described above, in the study completed by Orsulic-Jeras, Judge, & Camp, 2000). Affect was measured through the use of the Apparent Affect Rating Scale (AARS). The AARS measured five emotions: pleasure, interest, anger, anxiety/fear, and sadness. Each emotion was rated on a five-point scale: 1 = never; 5 = very much.

| | A paired sample t-test was used in order to compare active engagement before and after the study. Results revealed a significant increase in active engagement during times where Montessori-based activities were used, (t (8) = 3.36, p < .01), averaging 78 extra seconds (a 40% increase).

A significant decrease in passive engagement was shown in the Montessori-based activities (t (8) = -4.38, p < .01). This averaged to 49 fewer seconds (69% decrease) of passive engagement during the Montessori programming.

Non-engagement was rarely seen during the study, and differences between regular and Montessori visits were not significant. Self-engagement also was rarely seen, and was never seen in the Montessori-based activities. |
2 = < 16 seconds; 3 = 16–59 seconds; 4 = 1–2 minutes; and 5 = 2–5 minutes.

In the first phase of intervention, visitors were introduced to Montessori programming, signed consent forms, and gave researchers background information on the residents (e.g., occupations, strength, and interest). Visitors also completed the life satisfaction and mastery, global measures of burden, in relation to visiting their relatives.

In the next phase, researchers observed visitors visiting the residents, as usual, on four separate occasions. Observations were completed throughout a three-week pre-test period. During the four pre-test-observations, researchers would observe the resident for five minutes, leave the room for five minutes, and would then come in and observe the resident for another five minutes. Throughout the same three weeks, researchers would meet alone with the residents and introduce them to Montessori programming, as well as assess their interests and skills in the activities.

In the next phase, visitors implemented the Montessori activities while researchers offered assistance. This phase lasted between two to five sessions. After this, visitors began implementing solely the Montessori-based activities without assistance from the researchers. Visitors independently implemented the activities for four sessions. During this time, data were collected on engagement and affect, in five minute intervals. Researchers would collect data for five minutes, leave the room for five minutes, and return to collect data for five minutes. After these sessions visitors answered questions on, burden, satisfaction, and mastery.

Results revealed that resident affect scores demonstrated no significant differences between the regular and Montessori-based visits.

Of the questions visitors answered on burden, satisfaction, and mastery only one resulted in statistical significance. Data collected indicated that there was a significant decrease in visitors’ self-reported burden, \( t(8) = 2.32, p < .05 \), after the Montessori-based activities were completed.

After this study was completed, visitors answered questions about whether they would recommend these activities to a friend, and whether they saw changes in their loved ones. All stated that they would recommend these activities to a friend, and that they saw a positive change in their loved one during the Montessori-based activities.

One hundred thirty-three residents who had dementia took part in this study. To take part in this study individuals had to: (1) Have a diagnosis of dementia by a doctor, (2) have a score of 35 or above on the Cohen-Mansfield Agitation Inventory (CMAI) (3) stay in the institution for the entire period of study (4) have no infection, broken skin, or amputation on the acupressure points that were selected for the study. Participants were selected from six special care units, from long-term care facilities.

A double-blind experimental cross-over design was used. Affect, ease of care, and agitation were measured in this study. In order to avoid confounding variables, the six special care units were randomly assigned to one of three sequences. Each sequence contained, acupressure (I1), Montessori methods (I2), and presence/control (activities as normal) (I3). A three-period crossover design was used. Forty-two residents were assigned to intervention Sequence I (I1, I3, I2). Thirty-nine participants were assigned to intervention Sequence II (I2, I1, I3). Finally, 52 residents were assigned to intervention Sequence III (I3, I2, I1). Data were collected over a year long period.

During each day of treatment, residents received their assigned intervention. Acupressure and presence (control) were implemented in 15-minute sessions once a day, six days a week, for a 4-week duration. Meanwhile, the Montessori methods group received intervention in 45-minute intervals, once per day, 6 days a week, during a 4-week span. Montessori methods were individualized to the participant. Between each intervention sequence, there was one week of post-testing, followed by two

In order to adjust for subject differences in the three sequences, including: age, sex, family visits, and restraints, these different characteristic were included as covariates in the generalized linear mixed model analysis.

Results demonstrated that after receiving intervention, CMAI total scores, aggressive behaviour, and physically aggressive behaviour all significantly decreased in the Montessori and acupressure phases, compared to the presence phase.

Results also showed that ease of care was significantly higher in the Montessori-based and acupressure phases, compared to the presence phase.

It was also found that mean differences in apparent affect was significantly more positive in the Montessori phase, compared to the control phase.
weeks of washout (no treatment provided to eliminate effects of intervention), and another additional week of pre-testing. In the pre-test periods, baseline data, which consisted of the frequency and intensity of agitated behaviours, were observed and collected. In the post-test periods, the same data were collected in order to evaluate the effect of the different treatments.

In the acupressure intervention, five points were chosen in order to treat the agitation behaviours most often seen in patients with dementia. Each intervention session started with five minutes of warm-up activities, such as rubbing, holding, and pressing the palms and finger joints. Next, acupressure was completed on each point for two minutes.

The Montessori-based activity intervention targeted five major categories of activities that are associated with daily living: pouring, scooping, fine motor skills, squeezing, environmental care, and personal care. Before activities began, sensory stimulation was completed (e.g., music, aroma therapy). After the activities were completed, the leader would tell the participants of what activities would be completed during the next session.

In the presence phase, the participants would be seated. Leaders would engage the participants in conversation, and would try to maintain the person’s attention during the 15-minute duration.

Affect was measured through the Apparent Affect Rating Scale (AARS). This scale measured five emotions: pleasure, interest, anger, anxiety/fear, and sadness on a 5-point scale (1 = never, 5 = 2 to 5 minutes).
Agitation was measured using the Cohen-Mansfield Agitation Inventory (CMAI). The CMAI consists of 29 agitated behaviours that were rated on a 7-point frequency scale. The higher the score the increased level of agitation. The CMAI consists of three subscales: aggressive behaviour, physically non-aggressive behaviour, and verbally agitated behaviour.

Ease-of-care was an inventory that was created in order to assess the ease of care for nurses when assisting residents with toileting, eating, bathing, grooming, sleeping, walking, and other activities. The ease-of-care scale consists of seven items. Each item is rated on a 5-point Likert scale. Scores range from 1 to 35, and the higher the score the greater ease of care.


A repeated measures, crossover design with random allocation of the order of treatment and control condition was used. Thirty-four participants were recruited from aged-care facilities in Australia. Both agency staff members, and participants were blind to the hypothesis of the study. Participants were either defined as responders (i.e., engaged in agitated behaviours for under 15 minutes [n=24]), or non-responders (i.e., engaged in agitated behaviours for more than 15 minutes). Participants who were non-responders were defined as individuals who engaged in agitated behaviour for the majority of the session (i.e., over 15 of 30 minutes [n = 10]).

Individuals who took part in this study must have met the following criteria: (a) a diagnosis of dementia; (b) agitated behaviour that occurred at least a few times each day; (c) confirmation by either a nurse, a physician, or a psychiatrist that

It was found that participants who were classified as non-responders were slightly older and predominately male. However, these differences were determined to be not statistically significant. The authors determined that the two groups (responders and non-responders) were not different in terms of agitated behaviour, measured by the CMAI, or regarding their living situation, or in how they were randomized during the intervention. The Mini-Mental State Examination scores for the non-responders approached 0, while the
the agitated behaviours were not caused by physical illness, or pain; (d) lived in a special care dementia unit for a minimum of three months; (e) provided consent to participate in the study. The Mini-Mental State Examination was provided to each participant, to determine the severity of dementia.

Residents were excluded if (a) they refused to participate in the intervention on two separate occasions, (b) their psychotropic medications were hypothesized to be altered during the study period, (c) they had an acutely life-threatening physical illness, or (d) their agitated behaviour demonstrated a potential danger to researchers.

Data on agitation was measured through the Cohen-Mansfield Agitated Behaviour Inventory (CMAI), by unit nurses. Over 90% of the targeted agitated behaviour was wandering and pacing. An observer, who had been previously trained, recorded whether the agitated behaviour had occurred (i.e., yes/ no) in 1-minute intervals over three 30-minute data recording periods before, during, and after the Montessori or control period. This resulted in agitated behaviour scores, which ranged from 0 to 30.

Affect was measured using the Philadelphia Geriatric Center Affect Rating Scale. Scores on affect ranged from 0 to 30, for each 30-minute period. The Menorah Park Engagement Scale was used to measure constructive engagement (i.e., actively talking or using activity objects) and was recorded every minute. Scores ranged from 0 to 30 each period.

Data were analyzed using IBM SPSS Statistics 21.0. Crosstabs with Fisher’s responders score was a mean of 3.

Scores for agitated behaviour, interest, and constructive engagement significantly improved in both the Montessori and the control conditions, compared to baseline. An exception was found in agitated behaviour during the Montessori condition for the non-responders group.

It was revealed that non-responders did not perform as well on all measures, compared to responders, during both conditions. Responders demonstrated a significant decrease in agitated behaviour, as well as an increased task-interest and engagement, during the Montessori condition compared to the control condition. For participants who were non-responders, agitated behaviour scores were similar in both the Montessori and control conditions. However, constructive engagement and interest were higher for responders during the Montessori condition.

Spearman correlations revealed strong relations between agitated behaviours in the
exact tests were used in order to determine the differences for nominal variables between the responders and non-responders. Differences in continuous variables were explored using Independent Samples Mann Whitney U tests. The Related Samples Wilcoxon Signed Rank Test was used in order to explore differences between conditions regarding participant agitated behaviour.

Finally, Spearman correlations were used to understand the association of gender, age, English as a first language, conditions order, baseline scores for agitation, affect and cognition deficits.

Baseline data were collected for two weeks prior to the beginning of intervention. Participants were randomly placed into either the Montessori condition or the control condition, which they received for two weeks. After these two weeks were completed, participants were switched and received the other condition. Both the Montessori and the control conditions were delivered twice a week, for 30 minutes, on a one-to-one basis. Therefore, each participant received four Montessori and four control sessions. Sessions were always completed at the same times and in the same area.

Therapists who implemented the Montessori activities were trained through the use of written guidelines and a didactic presentation. Montessori activities consisted of looking and sorting pictures, singing to music, sorting dry pastas, arranging flowers, folding towels, screwing nuts and bolts together, planting seeds, and solving puzzles.

In the control condition, therapists engaged with the participants in non-intervention and baseline Mini-Mental State Examination score. It was revealed that participants with significant cognitive impairments engaged in more agitated behaviours. Participants who engaged in agitated behaviour before the intervention were strongly correlated to engage in agitated behaviour during the whole period of intervention.
personalized one-to-one interactions. Interactions consisted of general conversations based on newspaper pictures and stories. If conversation was not achieved, the therapists would sit and keep the participants company.

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<td>The participants in this study consisted of 14 elderly individuals, with moderate to severe dementia, living in a long-term care facility. All participants completed the Mini-Mental State Examination and received scores ranging from 6 to 23 (M=15.4). Participant degree of functional autonomy was evaluated through the use of the Functional Autonomy Measurement System (SMAF). SMAF scores ranged from -35 to -65.5, with an average of -52. A quasi-experimental design was used where the participants were compared with themselves while completing two interventions, and a control period. The two interventions consisted of a regular activity intervention (placebo) and a Montessori-based activities intervention (experimental). The control condition consisted of the participants engaging in no activity. Subjects affect was measured by both direct and indirect (video-recording) observation in all three conditions. Participant mood, intensity of participation, disruptive behaviour, and the intensity of stimulation were observed by video recording in the regular and Montessori programming. Data were collected by two evaluators, a graduate student and a research experimenter. Each participant received all three conditions, however, the order of the conditions varied among the participants. The amount of time between each condition was two weeks, in order to ensure stability of the participant and condition.</td>
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<td>Each of the 14 participants were assessed twice in each of the three conditions The scores obtained on affect were 19.3 in the absence of intervention, 2.6 during regular activities, and 22.3 during the Montessori-based activities (out of a maximum, score of 25). It was revealed that the averages were statistically different with an error threshold of -.005 (p &lt; 0.0001). The effect of the different interventions on mood as expressed by participants was assessed during the regular and Montessori-based programs. The results gathered for the regular programming were 10.5, while the results for the Montessori-based programming were 10.1 (with a maximum score of 12). The results gathered were not statistically significant (p = 0.3824). The activity participation scores were measured during both the regular (placebo) and</td>
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Intervention activities lasted up to one hour. Nevertheless, all participants were filmed and observed in the regular and Montessori programs during 20-minute periods. Also, participants were observed during periods of inactivity for 10 minutes. Inactivity was defined as the participant being uninvolved in activities such as eating, reading speaking, or watching television.

Before beginning to implement the Montessori-based activities, the therapist received training from a Montessori-certified teacher. In the Montessori-based programming, participants made associations with and handle different objects. Activities chosen involved cognitive, executive, sensory, and motor functions. Montessori activities began with the therapist introducing the materials. After the activity was finished, it was withdrawn and another activity was given. Emphasis was placed on the realization of the activity, not the success.

In the placebo intervention, programming consisted of the activities usually completed on unit. Activities consisted of music, group games, and bingo.

The Philadelphia Geriatric Center Affect Rating Scale (ARS) was used to measure participant affect. The AARS included observation scales of five stages of effectiveness (pleasure, anger, anxiety, sadness, and general alertness). The AARS is completed during a 10 minute period, where the observer estimates the length of time the participant engages in each emotion. 1 = never, 2 = less than 15 seconds, 3 = between 16 and 59 seconds, 4= between 1 and 5 minutes, and 5 = more than 5 minutes. As a result, scores can range from 5 to 25.

Montessori (experimental) programs. The average score acquired in the placebo programming was 2.5, while during the experimental program the average was 2.95 (3 being spontaneous active participation; 2 being passive participation; 1 being no participation; and 0 for sleepiness. A significant effect of the type of intervention (placebo or experimental) was found for participation (p<0.0001).

Also, the intensity of stimulation the therapist provided during the activity was measured during the regular and Montessori-based programming. The average during the regular programming was 1 and the average for the Montessori-based programming was 2.3 (3 being no explanations; 2 for verbal explanations; 1 for verbal explanations combined with a demonstration; and 0 for physical assistance combined with verbal explanations). A statistically significant difference was found for the difference in the intensity of stimulation (p = 0.0026), between
Participant positive and negative moods were measured using the Dementia Mood-Pictures test. This test is a simple questionnaire that is combined with six faces representing moods, such as good mood, bad mood, sad mood, angry mood, anxious mood, and happy mood. These images were shown to the participant individually, and they answered a yes or no to each mood.

The Cohen-Mansfield Agitation Inventory was used in order to measure participant agitation. In this study, the observer identified whether the agitated behavior occurred at the time of the activity being observed.

A scale that had been developed by Kocach and Magiocco (1998), was used to measure subject participation in activity. Observations were completed over a 30-minute period, where the observer marked the participation intensity every three minutes on a scale from 0 (sleepy), to 3 (active participation). Also, the intensity of the stimulation necessary from the leader to encourage participation was scored during the same time period, every three minutes from 3 (spontaneous participation) to 0 (verbal explanations and physical assistance required).

The total amount of time of active, passive, and no participation was measured during the regular and Montessori-based programs. In the regular programming, participants actively engaged for an average of 41.8%, passively engaged for an average of 55.1%, passively participated for an average of 1.0%. During the Montessori-based programing, participants actively participated for an average of 92.4%, and did not participate in any activity for an average of 84.4%. The average values were statistically significantly different (p < 0.0001).

The GENMOD was used to validate whether the type of intervention had an influence on the type of subject participation. During the regular programming, the average sum of ranks was 106.33 for active participation; 93.5 for passive participation; and 49.6 for no participation. While in the Montessori-based programming, the average sum of ranks was 106.33 for active participation; 93.5 for passive participation; and 49.6 for no participation. The average values of percentages were statistically significantly different (p < 0.0001).
dependent variable. The t test (p = 0.05) was used to evaluate whether there was an intervention effect on the dependent variables. To examine the correlations for responses between the three conditions, for the same participant, the GENMOD repeated measures procedure was used. The average sum of ranks was 141.2 for active participation; 55.6 for passive participation; and 42.7 for no participation. Consequently, subjects were significantly more active during the Montessori-based programming than during the regular activity programming (p < 0.0001). Intervention effects on participant affect and participation, during regular and Montessori-programming were statistically significant (p < 0.0001).

The Pearson correlation coefficient between participation scores and global affect was 0.52 (p < 0.0001). Consequently, there was an average significant correlation between participant affect that was observed by the raters. It was found that increased active participation correlated with more positive affect. The Pearson correlation between the intervention scores and the participation scores was 0.03 (p = 0.8121). In consequence, no significant correlation was found between those variables. Also, the Pearson correlation
between intervention scores for active, passive, and non-participation were: -0.11 (p = 0.4199), 0.22 (p = 0.1180), and -0.27 (p = 0.0411). A significant correlation between the intervention scores and the different types of participation was not found.


In this study geriatric individuals with dementia mentored children to complete Montessori activities, in a process referred to as intergenerational programming. Geriatric participants consisted of 12 individuals with dementia, whose ages ranged from 70 to 96. Nine of these individuals lived in long-term care facilities (LTCF) special care units, whether the other three participants attended adult day centres. Two of the subjects were men, and the remainder 10 were women. The Mini-Mental State Examination (MMSE) was provided to the participants, and scores ranged from 9 to 23. The Direct Assessment of Functional Status (DAFS) was also administered to the subjects. The DAFS measured participant activities of daily living and independent activities of daily living. DAFS subtests included telephone skills, working with money, eating, grooming. Scores falling more than two standard deviations (SD’s) in each subtest, indicated a functional deficit. For the 13 subtests measured, scores ranged from 0 to 8 subtests passed. The mean score was 5. Participants were also provided seven Montessori-based activities for the purpose of baseline measures of motor, cognitive, and sensory functioning. Activities consisted of using tools, gripping, fine motor, and finding hidden objects. A point was

It was found that total amount of successfully taught Montessori lessons increased, as both the geriatric individuals and children became increasingly familiar with this way of teaching and with each other. The average amount of lessons that were able to be successfully taught at the end of this study were 22.3, ranging from 10 to 39. These results demonstrate that geriatric individuals can serve and mentors during intergenerational programming.

For measures of disengagement, in 117 of 167 observations (17%) that were taken during the early morning, before intergenerational programming, one instance of disengagement or more was noted. During 35% of these observations, the disengagement
Scores ranged from 3 to 7, with a mean of 5.2

The children participants completed the same seven Montessori activities as the geriatric individuals. This allowed the researchers to pair each geriatric individual with a child who was not yet at their ability. The children in this study came from a child day care centre that was on-site. Ages ranged from 2.5 to 4 years of age, and participants consisted of six boys and eight girls. Each child worked with a variety of different old adults, on a rotating schedule.

Prior to the beginning of the intergenerational sessions, researchers worked with both the geriatric and children and introduced them to the Montessori-based activities.

The intergenerational sessions took place weekly, for between 30 and 45 minutes. Throughout the course of this study, over 75 sessions were conducted. Activities were always implemented on a regular schedule, at the same time, at the same setting. During the intergenerational sessions, the geriatric adults served as the mentor during times where staff were available, but only offered minimal assistance.

Data were recorded on whether the individuals with dementia could successfully teach lessons, as well as whether they were able to teach a wide variety of lessons. Successful teaching was defined as the successful completion of an activity that had been presented to the child by the geriatric individual who had dementia.

Behaviour lasted the entire data collection interval. During mid-morning data collection periods, disengagement behaviours were seen during 67% of observations that were collected on days that residents did not work with children. During 37% of these observations, disengagement lasted the entire data collection period. During observations completed during the late morning, 53% demonstrated instances of disengagement, with 25% of these instances lasting the entire period.

The data collected indicates that disengagement was a common feature of the long-term care facility setting. Researchers noted that no instances of disengagement were seen during the 53 observation periods that took place when the geriatric individuals were teaching the children. Additionally, during the intergenerational programming no instances of aggression, confusion, or anxiety were observed in the geriatric individuals with dementia.
Data were also collected on resident apathy, which was defined as staring into space for more than 10-seconds, or sleeping. Five-minute behavioural observations were completed on the eight subjects who were living in a special care unit before, during, and after the geriatric participants worked with the children. Frequency and duration of disengagement was measured during this time.

| Intergenerational programming was used, where geriatric individuals were paired with children to teach them to complete Montessori-based activities. Geriatric participants consisted of 14 long term care facility residents who were living on a dementia special care unit. All geriatric participants were diagnosed with dementia, and were deemed medically stable to participate in these activities. Geriatric participants were Caucasian and mainly female (93%), whose ages ranged from 85-94 years old. Mini-Mental State Exam scores ranged from 5 to 25, which indicated minimal to severe cognitive impairments. Children participants consisted of 15 children from the agencies on-site child day care. Children were between the ages of 2.5 to 5 years. Geriatric participants were all provided the Myers Menorah Park/Montessori Assessment System (MMP/MAS). The MMP/MAS measures an individual’s ability to perform seven Montessori-based activities using qualitative measures. Montessori-activities consisted of: scooping golf balls; searching for coins; transferring cotton balls; sorting photographs; and arranging objects. The MMP/MAS was used in order to determine the types of Montessori-based activities deemed to be most appropriate for the geriatric participants during to intergenerational programming. The |
| To measure engagement a multivariable approach to repeated measures ANOVA was used. This revealed significant effects for the type of program (F(1, 12) = 456.97, p=0.001) and for the Time of Observation (F(2, 11) = 209.93, p = 0.001). These effects were subsumed by Programming Type x the Time of Observation (F(2, 11) = 208.62, p = 0.001). CE that was elicited by intergenerational Montessori activities compared to regular activities were compared using post-hoc paired samples t-tests. It was found the CE was observed more often during the intergenerational Montessori activities compared to the regular activities (t(13) = 22.90, p = 0.001). A repeated measures ANOVA using a multivariable approach |
MMP/MAS was also provided to all children who participated in the study. This was completed to determine the several types of Montessori-based activities the children could engage in, and helped the researchers to match the children/geriatric individuals into pairs.

At the beginning of the study, the geriatric individuals were assigned at random to one of two groups, which were based on the order they received treatment. Group 1 began with 6-months of the control condition (consisting of the units regular activities programming), followed by 6-months of intergenerational Montessori-based programming. Meanwhile, Group 2 at first received the 6-month intergenerational Montessori-based treatment, and then received the 6-month control condition. Independent sample t-tests were completed that revealed no significant differences between the two groups, based on characteristics of MMSE scores and age. Chi-square analyses were also completed that demonstrated no significant differences between groups, based on characteristics of type of dementia, gender, and education level.

Engagement was measured by Myers Research Institute Engagement Scale (MRI-E), which measures five separate types of engagement: constructive engagement (CE), passive engagement (PE), active engagement (AE), self-engagement (SE), and non-engagement (NE). CE was operationally defined as any verbal or motor behaviour in relation to the activity (e.g., handling materials, talking to the child). PE was operationally defined as looking or listening behaviour observed directly in relation to the activity (e.g., listening or

| on PE demonstrated significant main effects for Programming Type (F(1, 12) = 15.18, p = 0.005). This effect was mitigated in a Programming Type x Time of Observation interaction (F(2, 11) = 19.83, p = 0.001). It was found that participants with dementia demonstrated decreased PE during intergenerational Montessori-based programming than regular activities programming (t(13) = 6.55, p = 0.001). Repeated measures ANOVA that used a multivariable approach on AE demonstrated significant main effects for the Time Observation (F(2, 11) = 41.30, p = 0.001). This effect was subsumed by a significant Programming Type x Time of Observation interaction (F(2, 11)). Therefore, participants who had dementia, engaged in a decreased amount of AE during intergenerational Montessori-based activities compared to regular unit activities (t(13) = 6.62, p = 0.001). Using multivariable approach to repeated measures ANOVA |
watching the child during the intergenerational programming). AE was operationally defined as verbal or motor behaviour by the geriatric individual that was not related to the activity, but was a response to the environment (e.g., talking to others while ignoring their child partner and/or the activity, handling objects not related to the activity). SE was operationally defined as verbal or motor behaviours by the geriatric individual that was in response to themselves, not the activity (e.g., picking teeth, picking clothing buttons). NE was operationally defined as a lack of attention in response to external stimuli (e.g., having eyes closed, sleeping, or staring into space).

Data were collected on the geriatric individuals two days a week, during three separate times of the day: (a) before the intergenerational programming, (b) during the intergenerational programming (control participants took part in their regular unit activities), and (c) after the intergenerational programming. Data were collected by researchers on engagement for 5-minute periods during each of those three time periods.

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<tr>
<th><strong>Programming Type x Time of Observation Interaction</strong></th>
<th><strong>Time of Observation</strong></th>
<th><strong>Interaction</strong></th>
<th><strong>Main Effect</strong></th>
<th><strong>Significance</strong></th>
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<td>AE</td>
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A multivariable approach to repeated measures ANOVA demonstrated significant main effects for the Time of Observation (F(2, 11) = 12.56, p = 0.001. This effect was contrasted through the use of a significant Programming Type x Time of Observation interaction (F(2, 11) = 6.72, p = 0.01). It was found that the geriatric individuals with dementia engaged in a significantly decreased amount of NE during the intergenerational Montessori-based activities programming than during regular unit activities programming (t(13) = 5.56, p = 0.001).

Four female individuals who had early-staged dementia were trained to lead nine other individuals with advanced dementia in a small-group activity, a process known as Resident-Assisted Montessori Programming (RAMP). Participants were selected from a living facility for seniors.

To analyze data, the repeated measures analyses of variance for the Type of Session factor, with Helmert contrasts was used.

For the leader participants, three were selected from a long-term care facility, while one lived in assisted living. Leader ages were 74, 75, 80, and 91 years. Study players, or individuals who were taught the activities, consisted of seven women and two men selected from a dementia special care unit. Player ages ranged from 82 to 95. The Mini-Mental State Examination was completed with the players and scores ranged from 1 to 13, indicating severe cognitive impairments.

Leaders taught the players to take part in a small group activity called Memory Bingo. Memory Bingo was a small group activity (n = 3 to 7). During this activity, participants received four cards. Each card had a question on it, as well as an answer in response to the corresponding card. The group leader would hold up a “calling card” that had a statement on it that was not complete. For example, “Beauty is in the eye of the ...” Participants took turns reading the phrases and questions off their cards, and answering the card questions. Once all four playing cards were turned over, the game was finished.

Leaders attended training sessions either once or twice a week. The number of training sessions for leaders ranged from two to eight, depending on the leaders comfort level. Once the leader felt comfortable with the game, they began to implement the game in a real-life setting, with residents receiving cues from the research staff as needed. These training sessions lasted one to three sessions. After this point, the training was concluded and data began to be collected. During this time, researchers did not offer cues, but remained in the room to collect data.

Data collected on players revealed that only three instances of refusal to participate occurred during the study. It was noted that all refusals occurred outside of the RAMP intervention. During pretreatment baseline data collection every player participant attempted to leave at least once during an activity. Once RAMP began, only one resident left during an activity and researchers noted that it was during regular unit programming.

For data collected on CE, type Type of Session was significant F(2, 14) = 6.43, p < .01. Means for the standard activity were 0.75 at baseline, 1.15 during standard activity after RAMP initiation, and 1.28 for the RAMP activity (on a scale from 0 to 2). A Helmert contrast was completed, which found that CE was significantly decreased after the initiation of RAMP during both the regular and RAMP activities. However, comparisons between the regular and RAMP activities were not statistically significant.

It was found that PE did not result in significant
During the RAMP sessions, data were collected by staff on whether leaders were completing the tasks required to lead Memory Bingo successfully. Leaders were also interviewed in order to determine their satisfaction levels with RAMP.

Engagement levels for players were measured through the use of the Menorah Park Engagement Scale (MPES). The MPES measures the four most common types of engagement displayed by individuals with dementia. Constructive engagement (CE), passive engagement (PE), non-engagement (NE), and self-engagement (SE) (described above in a study completed by Orsulic-Jeras, Judge & Camp, 2000). Items of the MPES are usually scored from 0 (never seen), 1 (seen half the activity time), or 2 (seen more than half the activity time). Player level of engagement were also measured during this time using the MPES. The MPES included categories originally created from the Affect Rating Scale (ARS). The emotions measured included pleasure and anxiety/sadness.

Each player in this study was observed during six baseline sessions, six sessions of regular scheduled unit activities, and 6 to 10 sessions of RAMP activities. Each player was observed for 5-minutes within each session. RAMP sessions were conducted between one to three times each week, and lasted between 25 to 40 minutes.

data collected revealed that NE rarely occurred throughout the completion of this study.

For SE, the Type of Session factor was significant, $F(2, 14) = 55.30, p < .001$). The Mean at baseline was 1.10 for the standard activity, 0.60 during standard activity after RAMP initiation, and 0.25 during the RAMP activity (on a scale from 0 to 2). A Helmert contrast was completed which demonstrated that SE was significantly higher during baseline than in both the regular and RAMP programming. It was also found that SE occurred more during the regular programming than in RAMP programming.

The only emotion seen frequently during intervention sessions was pleasure. When measuring affect, for pleasure the overall Type of Session factor approached significance $F(2, 14) = 3.50, p < .06$. Means for the standard activity were 0.42 at baseline, 0.27 during

In this study, residents with mild dementia (i.e., the leaders) were trained to teach Montessori-based activities to individuals with moderate to severe dementia (i.e., the participants).

Leaders consisted of one assisted-living resident, two individuals living in a dementia special care unit, and three individuals who attended an adult day care center. These individuals were trained to lead a Montessori reading activity which was called Question Asking Reading (QAR). Ages of the leaders ranged from 75 to 93, and Mini-Mental State Examination scores indicated that leaders were in the early stages of dementia.

Participants consisted of 22 individuals in the late stages of dementia. Six participants attended the QAR sessions at the adult day center (site #1), and the other 16 participants completed sessions at the special care unit (site #2). To participate in this study, participants must have been over the age of 60, have a diagnosis of dementia, and score 23 or

| standard activity after RAMP initiation, and 0.51 for the RAMP activity (using a scale of 0 to 2). The Helmert contrast revealed that differences were not statistically significant. |
| The results also demonstrated that leaders had the necessary skills to be an effective group leader. Leaders also expressed high levels of satisfaction with the role of being a leader. |

Overall, statistically significant differences between the dementia care unit, adult day centre and special care unit were not observed. Still, group differences were detected for passive engagement (PE), therefore the analyses below comprised of combined data from the two sites, with an exception being made for PE.

A repeated analyses of variance for Type of Session factor (Baseline 1, Baseline 2, and Treatment) was conducted for each MPES item, through the use of priori simple contrasts (Baseline 1 versus Treatment). This allowed researchers the opportunity to conclude
lower on the Mini-Mental State Examination.

During QAR programming, the leader handed out copies of a story to all participants. The stories were age-appropriate and related to the interests of participants. At the bottom of each page in the book was a prompt, a box reading “Next Reader Please.” The leader would begin by reading the first page, while participants followed along. Afterwards, the participants would take turns reading one page of the story out loud. Once the story was finished, the leader would hand out a coloured card to all participants. Each card was placed on the table face-down, and had a question or fact on it. The leader would initiate discussion by asking the participants “Who has the purple card?” The individual who had the purple card would be prompted by the leader to turn over the card, and read the statement out loud to begin the discussion. The QAR would be finished once all cards had been turned over.

Prior to the implementation of QAR, the leaders were trained to implement the activity. QAR leaders completed a task analysis, with all the activities included with QAR being put on to a checklist. Leaders were at first shown a demonstration of the QAR. Following this demonstration, the individuals being trained to lead the sessions, while staff members provided assistance as needed. At the end of all training sessions, the leaders were asked if they were comfortable to independently lead a session. Once the leaders stated they were comfortable, they were put into groups and led the QAR activity. Leaders received between two to eight training sessions, depending on their level of comfort. Data were collected on whether whether RAMP activities resulted in differences in engagement from regular unit programming prior to and after the implementation of RAMP.

It was found that participants who took part in the study engaged in significantly more constructive engagement and pleasure, and less self-engagement and non-engagement during Treatment activities when compare to both Baseline 1 and Baseline 2 activities.

There was no significant main effect found in passive engagement for the Site factor. There was also no significant effect in the Baseline 1 versus Treatment (RAMP) contrast, and it was noted that this factor did not significantly interact with site. Statistically significant Group x Type of Session contrast was seen, however for the Baseline 2 versus Treatment contrast, F (1, 20) = 4.95; p<.04. Participant scores in adult day care centers decreased from 0.47 during Baseline 2, to 0.22 during Treatment. This revealed that in this study, participants...
the leaders completed their roles/tasks successfully (did they hand out the correct sheet, or complete all the steps).

While the leaders were in training, researchers observed the participants completing regular unit activities (e.g., cooking, bingo, exercises, and sing-a-long). The Menorah Park Engagement Scale was used to collect data on participant engagement and affect. Data collected at this time were labeled Baseline 1. Once data were finished being collected for Baseline 1, but before leaders were finished training, the participants completed between two and three QAR sessions which were led by research staff. This was completed in order to familiarize the participants with QAR before the leaders led the activity. Data were not collected during this time. In the treatment part of this study, MPES data were collected on participants during the QAR sessions led by leaders, and on participants who completed regular unit activities (i.e., Baseline 2). The Baseline 2 phase allowed researchers to examine whether effects seen during QAR generalized to activities outside of the program.

The QAR Leader Assessment Form was used to track whether or not the leaders completed key procedures necessary for leading the activity, such as passing out cue cards. For every procedure there were three possibilities: (a) the leader completed the task with full adherence; (b) the leader completed task in partial adherence or; (c) the leader did not complete the task.

Participant engagement was measured through use of the Menorah Park Engagement Scale (MPES) which measured the four most common types of demonstrated increased levels of passive engagement during regular unit activities than during intervention. Nevertheless, special care unit scores for passive engagement increased from 0.90 at Baseline 2 to 1.26 at Treatment. This showed that residents in the special care units engaged in higher levels of passive engagement in RAMP programming than during regular unit activity programming.

The QAR Leader Assessment Form indicated that leaders followed the procedures involved in leading the activity consistently. In regards to the leaders passing out the stories to participants, all six leaders engaged in partial adherence during 100% of activity sessions. All but one leader engaged in full adherence for at least 80% of sessions. In regards to asking a participant to read the upcoming section, all six leaders engaged in partial adherence during 100% of sessions. Two of the six leaders engaged in full adherence 80% of the time. Regarding the leaders initiating
engagement displayed by individuals with dementia. Constructive engagement (CE), passive engagement (PE), non-engagement (NE), and self-engagement (SE) (described above, in the study completed by Orsulic-Jeras, Judge, & Camp, 2000). Items on the MPES are usually scored from 0 (never seen), 1 (seen for half the activity), or 2 (seen more than half the activity time). Player levels of pleasure were also measured during this time. The MPES also included categories that were created from the Affect Rating Scale (ARS). The emotions measured included pleasure and anxiety/sadness.

Participants were observed during six sessions at baseline, six sessions during regular unit activities, and 6 to 10 sessions of RAMP activities. Data were collected on participant engagement and affect for five minutes each session.

Once the QAR sessions were finished, leaders completed a satisfaction survey which was administered in the format of a structured interview. This interview measured leader opinions regarding the QAR activity, as well as future recommendations for improvement.


The study used a single-blind, quasi-experimental study with repeated measures. Participants who were put into the fixed and individualized groups (those who received fixed and individualized spaced retrieval combined with Montessori programming) were compared and contrasted to participants in the control group (who received regular activities as usual). After the interventions were complete, data were collected at post-test, and the 1, 3 and 6-month follow ups.

Significant differences were found between the three groups during pre-test for MNA scores (P = 0.003), BMI (P = 0.006), and the CSDD scores (P = 0.001). It was found that plateaus of improvements took place between pre-test and the 1-month follow up. Medium to large effect sizes were found for the MNA and CSDD scores between the pre-test and the 1-month follow up.
The study participants were selected from the special care units of four long-term care facilities. To participate in this study individuals had to be diagnosed with dementia, score from 6 to 23 on the Chinese version of the Mini-Mental State Examination, speak either Chinese or Taiwanese, and pass a one-item spaced retrieval screening test. Twenty-five participants were in the fixed group, 38 in the individualized group, and 27 participants were placed in the control group.

Spaced retrieval is an intervention where individuals are asked to recall a piece of information after a certain period of time. In all spaced retrieval combined with Montessori activities, the participants were required to fully complete seven consecutive trials of spaced retrieval without error. If at first try the participants recalled correctly, the time intervals were increased from 1, 2, 4, 8, 16, and 32 minutes. During each spaced retrieval session, the participants only had to recall one memory. During the time intervals in the spaced retrieval, participants were promoted to engage in Montessori-based activities related to eating, such as pouring, scooping, matching, and squeezing.

In the fixed spaced retrieval with Montessori activities sessions, participants were given three or more sessions to practice recalling the information. Steps in the fixed sessions consisted of: (a) realizing that it is mealtime; (b) picking up a bowl and spoon; (c) scooping a mouthful of food and moving the food close to the mouth; (d) putting food into the mouth and chewing; (e) eating a whole meal continuously; (f) opening the mouth while the food is near the mouth; (g) 3-month follow up for both the fixed and individual interventions. Also a small effect size was found for BMI in both the intervention groups between the pre-test and 3-month follow up.

As significant differences were seen between the three groups at pre-test, a baseline covariate was put into the model to control the effect of pre-test differences. Significant interactions were found between fixed group and individual group for MNA scores, with the scores increasing by 0.84 in the fixed (P = 0.001) and 0.94 in the individualized intervention (P = 0.001). Also, significant changes were seen in BMI over time in both the fixed and individual groups, with slopes increasing by 0.39 in the fixed and 0.27 in the individualized group.

A stepwise multiple linear regression was conducted in order to investigate the intervention effects of nutritional improvement on depressive symptoms. It was found that compared to the control group, the individualized
chewing while the food is in the mouth and; (h) swallowing after chewing. In the fixed sessions, participants had to complete all steps in order.

Individualized sessions were similar to the fixed sessions. However, in the individual sessions training sessions were modified for each client. Also, participants could miss a step and still continue to engage in the chain without having to repeat all previous steps.

Participants who were in the control group received the regular unit activities.

Data were collected at pre-test, post-test, and the 1, 3, and-month follow ups using the Chinese Version of the Mini-Nutritional Assessment (MNA) which was used to detect malnutrition. The MNA included 18 items, and the scoring put the individuals into three separate categories: (a) adequately nourished (scored $\geq 24$); (2) Risk of malnutrition (scored from 17–23.5); (3) malnourished (scored <17). Participants were measured at three mealtimes. Data were also collected using body mass index (body weight divided by the square of height).

The Chinese Version of the Cornell Scale for Depression in Dementia (CSDD) was used to collect data on participant depression. Data were collected based on resident behaviour, mood and so on. CSDD scores range from 0 to 2, with 0 being absent and 2 severe.

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<th>Lin, L.C., Huang, Y.J., Su, S.G., Watson, R., Tsai, B.W., &amp; Wu, S.C. (2010). Using spaced retrieval and Montessori-based activities in participants from three long-term care facilities. To participate in this study individuals had to be diagnosed with dementia, score under 2 on the Edinburgh feeding evaluation in dementia (EdFED), be able to live in the facility during the whole study period, and score from 10 to 23 on the Mini-</th>
<th>intervention produced significantly increased changes in MNA scores ($B = 0.34$, $P = 0.003$).</th>
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A repeated-measures analysis of eating ability and nutritional status among groups were compared in order to determine the effects of intervention. It was found that EdFED scores
improving eating ability for residents with dementia.  
doi: 10.1002/gps.2433

Mental State Examination. Overall, 85 individuals participated with 82 participants finishing the study. Dropouts occurred because unwillingness to complete the study and hospitalization.

A single evaluator, blind, randomized control trial was used. In order to reduce the chance of residents confounding each institute was randomly assigned to either spaced retrieval intervention, Montessori-based activity intervention, or a control group. Interventions were completed three times a week, for 8 weeks, in 35 to 40 minute sessions.

Baseline data were collected on nutritional status, eating difficulty, and eating amount during three meals. After baseline data were collected researchers completed spaced-retrieval and Montessori activities for 8 weeks. After the 8 weeks of intervention the same data collected during baseline was again collected. No data were collected during the actual intervention period. The individuals in charge of collecting data did not know which group each participant was in.

Before the beginning of the study, the individuals who implemented the intervention were trained in spaced retrieval through reading the training manual, which was completed by the Myers Research Institute. Montessori-based activities were taught through demonstration. Training for both the spaced retrieval and Montessori activities lasted two-days.

Participants in the spaced retrieval group had to recall eating procedures and eating behaviour using 1, 2, 4, 8, 16, and 32 minute time intervals. In the Montessori-based activity group, participants as well as assisted feeding scores were significantly lower in the spaced retrieval and Montessori-based activities group, than in the control group.

Therefore, the interventions may decrease participant eating difficulty. Still, it was found that the total frequency of physical and verbal assistance needed during mealtime were significantly higher in the Montessori-based intervention group than in the control group. Also, it was found that MNA scores in the spaced retrieval group were significantly higher than in the control group. Meanwhile, MNA scores in the Montessori-activity group were significantly lower than the control group.
completed activities that consisted of scooping, hand-eye coordination, pouring, and squeezing. Meanwhile, the control group completed the activities usually provided on the unit.

Data were collected using the Edinburgh feeding evaluation in dementia (EdFED) which assessed the feeding difficulty in the participants. The EdFED included items on behaviours such as passivity, nursing intervention, and feeding difficulty. Items on the EdFED were rated from 0 (never occurred) to 2 (often occurred). The Mini-Nutritional Assessment (MNA) was used to collect data on resident risk of malnutrition. The MNA included 18 items and the scoring put the individuals into three separate categories: (a) adequately nourished (scored ≥24); (2) Risk of malnutrition (scored from 17–25); (3) malnourished (scored <17). Participant body mass index was also calculated using participant weight and height. Participant meal duration, and the amount of meal eaten was also measured.

All data were analyzed using SPSS 15.0 for window. An ANOVA were used to test whether the groups were homogeneous, while group differences were analyzed using a linear mixed model.

| Cohen-Mansfield, J., & Werner, P. (1997). The effects of an enhanced environment on nursing home residents who pace. *The Gerontologist*, 38(2), 199-208. doi: | Participants consisted of 27 residents who all engaged in high levels of pacing behaviour as scored on the Cohen-Mansfield Agitation Inventory (CMAI), and had a diagnosis of dementia. The goal was to decrease participant pacing and agitation through use of an enhanced environment. The enhanced environment consisted of decorating two
| Based on the observational measurements, it was found that during treatment participants spent significantly increased amounts of times in the enhanced corridors than in baseline. Participant location in areas other than the corridors, except... |
hallways of the nursing home with either a family person scene or a nature scene.

In the nature scene, posters and murals of forests were placed on the wall. As well, artificial trees and plants were added, and audio tapes of birds chirping were played. Using an Aveda EPA-1000 aroma diffuser machine, forest smells were emitted. In the people/family scene pictures of families (e.g., eating dinner) were placed on the walls. Also, pictures of people familiar to the residents such as John F. Kennedy were added to the wall. Artificial plants were also added, and music was played while a citrus aroma was emitted. A coffee table and armchair were also added in order to add a home-like feeling. In both scenes, two benches were added facing the pictures. This allowed the participants the opportunity to sit and stare at the scenes.

A multiple single-subject (AB) design was used in four 2-week phases. The first two weeks consisted of baseline, (Phase 1) with no scenes placed in either corridor. This was followed by three intervention phases: During the first intervention (Phase 2), both corridors were enhanced (i.e., one corridor with the nature scene and the other with the family scene). The following two weeks consisted of one corridor having no stimuli, while the other corridor had the family scene (Phase 3). During the last two weeks, one hallway was not enhanced while the second hallway was enhanced with the nature scene (Phase 4).

Observations were completed from Monday to Friday, for a total of 12 hours. Within each hour, data were collected for 3 minutes for every participant.
Residents were assessed using observational measurements where a researcher recorded the location of the residents through use of a computer event recorder. In order to measure the total frequency of time spent in the stimulated environment a photoelectric counter was used. The photoelectric counter counted the amount of time the counter is interrupted (when an individual walks in front of the beam). This device was placed at the entrance to each of the enhanced corridors. A strip-switch timer was also used in order to measure the duration and frequency of time spent sitting on the benches in front of each enhanced environment.

Data were measured on participant wandering, purposeful walking, exit-seeking, and trespassing. All data were recording using the computer event recorder. Wandering was defined as the resident walking with no known destination. Purposeful walking behaviour was defined as the resident walking towards a specific destination (i.e., bathroom). Meanwhile, exit-seeking was defined as the resident attempting to leave the unit. Finally, trespassing was operationally defined as the resident entering the nurses’ station or another resident’s room. An Ambulatory Device (Personal Activity Monitor 2 or PAM2) was used to measure pacing. The PAM2 was attached to the ankles of participants, and counted movement into 1-minute periods.

The agitated behaviour of participants was measured using observational measures, where researchers recorded physically non-aggressive behaviours, physically aggressive behaviours, verbally non-aggressive behaviours, and verbally aggressive behaviours. The decreased from 1.61 in baseline to 1.47 in Phase 2. Also, verbally aggressive behaviours decreased from 1.72 during baseline to 1.57 during Phase 2. However, these differences were again not statistically significant.

It was found that through the use of a mood rating (the CMAI), participants’ pleasure increased when sitting at the nature/forest scene as compared to no scene. Pleasure was measured as 1.05 in no scene and 1.11 in the nature scene, which was statistically significant; Wilcoxon alpha <.05.

Twenty-nine staff members at the facility were interviewed in regards to their scene preferences. All the members of staff stated they were satisfied with the enhanced environment. Of the staff, 52% preferred the nature scene, while 17% preferred the home scene. The remaining staff, 31%, liked both equally. Fifty-nine percent of staff members also stated that they thought residents preferred the forest/nature scene,
Behaviour was recorded every time the participant engaged in one of the specific behaviours (e.g., physical aggression). New episodes were recorded after 10-seconds with no incidence of the behaviour.

Nursing staff also collected data using the Cohen-Mansfield Agitation Inventory which consisted of 29 agitated behaviours on a 7-point scale (1= never, 7= several times an hour). Nurses collected data during the last three days of baseline and intervention.

Participant mood was measured using the Lawton’s Modified Behaviour Stream which included 6 moods, on a 3-point scale (1=never occurred, 3=occurred most of the time).

EdFED scores of nursing intervention and feeding difficulty for the pre- and post-test in routine activities and Montessori intervention were compared to determine participant improvement in eating difficulty. Results revealed that both physical assistance and EdFED scores post-test results were less than the pre-test for the Montessori intervention (p < 0.05). No significant difference were found between the pre- and post-test in the routine activities group. Participant self-feeding significantly increased post-test when compared to pre-test in the Montessori intervention group. This

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<td>Participants consisted of 29 individuals who were selected from two dementia units within a long-term care facility. To participate in this study participants must have had a diagnosis of dementia, score 2 or over on the Edinburgh Feeding Evaluation in Dementia (EdFED), and score from 12 to 23 on the Mini-Mental State Examination. This study utilized an experimental crossover design. The two separate dementia unit participants were assigned at random into two sequence groups in order to compare the effects of the interventions: Montessori intervention (I1) and routine activities (I2). Fifteen individuals were randomly assigned to Montessori intervention sequence I (I1, I2) while 14 residents were randomly placed into Montessori intervention sequence II (I2, I1). During each day of intervention, individuals were presented their assigned intervention.</td>
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The Montessori intervention was implemented once a day, three days a week, for eight weeks in 30 minute sessions. The individual who implemented the Montessori activities was registered nurse who knew which sequence each participant was assigned. Between each intervention period there was a two-week washout (i.e., two weeks without any intervention to reduce carryover effects). All study participants served as their own control.

The individuals who collected pre- and post-test data were blind to participant sequences. Baseline data were collected the week prior to each intervention for a total of three meals. Data were collected on the frequency of residents’ eating difficulty, caregivers’ verbal assistance, caregivers’ physical assistance, and resident assisted feeding during mealtimes. Other data collected included individual self-feeding frequency, self-feeding time and eating time. These data were also collected the week after the eight-week intervention to measure the duration effects of intervention, using the same methods.

Montessori-based activities in this study focused on five domains, scooping, pouring, hand-eye coordination, and squeezing. Each domain included four to five specific activities. The foods used in this study consisted of foods the residents were familiar with, but rarely received, such as candy, cookies, deserts, and cookies. At the beginning of the Montessori intervention music was played for sensory stimulation, and to remind residents of the activity sessions. Following the music, the leader explained the content of activities, place, and time. The trainer would ask the participant to touch one of the objects. The trainer demonstrated that participants self-feeding scores increased after receiving the Montessori intervention. In the routine activities group, self-feeding was significantly less in the post-test than in the pre-test. Therefore, residents self-feeding decreased after the implementation of routine activities.

EdFED mean differences, between pre- and post-test, in the Montessori intervention were significantly lower than compared to the routine activities phase. Meanwhile, self-feeding frequency, time, and EBS score were all significantly higher in the Montessori intervention than in the regular activities program. No other significant differences were observed.
would then ask “what is the object?” The participant would answer and state the name of the object. If the participant did not know the name of the object, the trainer would tell them the object name. Afterwards, the leader would review the activities and announce the activities to occur during the next session.

The Edinburgh feeding evaluation in dementia (EdFED) was used to assess participant feeding difficulty. The EdFED included items on behaviours such as passivity, nursing intervention, and feeding difficulty. Items were rated from 0 (never occurred) to 2 (often occurred). The Eating Behaviour Scale (EBS) was used in order to assess resident’s functional eating ability. To assess participant risk for malnutrition, the Mini-Nutritional Assessment (MNA) was utilized. The MNA included 18 items, and the scoring put the individuals into three separate categories: (a) adequately nourished (scored $\geq 24$); (2) risk of malnutrition (scored from 17–23.5); (3) malnourished (scored <17). Body mass index was calculated through finding the participants height and weight. Also, a stopwatch was used in order to measure the total duration of meal times.

| Zeisel, J., Silverstein, N.M., Hyde, J., Levkoff, S., Lawton, M.P., & Homles, W. (2003). Environmental correlates to behavioural health outcomes in Alzheimer's special care units. *The Gerontologist, 43*(5), 697-711. | The purpose was to compare differences found between the environmental design features of 15 dementia care units and levels of resident aggression, depression, agitation, social withdrawal, psychotic symptoms and agitation. Participants consisted of 427 individuals, 308 women and 119 men, who were between the ages of 53 and 102. Fifteen facilities were included, with each facility having between 20 to 50 residents. All dementia special care units had to have met the following criteria: must | The results revealed that units which had private and personalized resident rooms, resulted in statistically significant improvements in participant CMAI scores on anxiety than units without. Therefore, units which had private rooms showed a decrease in participant anxiety. It was also found that units which included |
have functioned as a secure, self-contained unit; must have been recognizable from the rest of the building; had to have staff members who were dedicated to the residents working on the unit; residents could only leave the unit when being monitored by a staff member; and only included residents with a diagnosis of dementia.

All units were measured on: exit control (whether exit doors were camouflaged); walking paths (whether walls were decorated with objects in order to attract residents); common space (privacy and individualized rooms); outdoor freedom (if residents could spend time in an open space/garden); residential character (whether the unit used residential furnishing); autonomy support (whether physical supports, such as handrails, were in place for residents) and; sensory comprehension (whether staff could control visual and auditory noise within the dementia care unit. Two separate staff measures collected data on the units in order to ensure fair markings.

The Cohen-Mansfield Agitation Inventory Scale (CMAI) was completed by nursing staff in order to collect data on resident agitation in this study. The CMAI was used to collect data on physical and verbal aggressions, property destruction, wandering, self-abusive behaviour, restlessness, inappropriate dress, attention-seeking, mishandling of objects, verbal repetitiveness, making strange noises, noncompliance, screaming, and hiding objects.

The Multidimensional Observation Scale for Elderly Subjects (MOSES) was used in order to collect data on the frequency of resident depression, anxiety, common space availability, resulted in statistically significant improvements in resident MOSES social withdrawal scores. In consequence, units which had an open common space had less resident social withdrawal.

Units which camouflaged their exits as a form of exit-control, had statistically improved MOSES depression scores, than units without this exit control. As a result, units with this form of exit-control had less depression than units without exit-control.

Units which included residential furnishing and personalized decorations led had significantly between CMAI aggression scores than units without. Consequently, units with these personalized furnishings had lower instances of resident aggression.

It was found that units in which staff could control noise (sensory comprehension) scored statistically significantly between on CMAI physical and verbal aggressive ratings, than

Family members who cared for individuals who had dementia were recruited through medical centers and media announcements. Inclusion criteria were living with a family member who had dementia, and identifying themselves as the primary caregiver of this individual. Two-hundred and two family caregivers’ participated in this study, 100 in the intervention group and 102 in the control group.

A researcher met with the caregivers at their homes, obtained consent, and completed the baseline interview. After which, caregivers were assigned at random to either treatment (intervention) or usual care (control) condition. Following three months of intervention, participants were again

Analyzed data revealed no significant differences between the two groups (intervention and control) in personal traits, and the nine measured components at baseline.

For the three outcomes measured for the individuals with dementia there was a statistically significant effect on IADL, with caregivers reporting less IADL decline in the intervention group than in the control group (p=.03). While ADL dependence showed less decline, and individuals with dementia

pessimism, happiness, and social behavior.

The Behavioral Pathology in Alzheimer's Disease (BEHAVE-AD) was completed by nurses in order to collect data on the frequency of resident paranoid delusions, and the misidentification syndromes (i.e., looked into the mirror and saw another individual).

units that did not. Residents engaged in less aggressive behaviours in units with sensory comprehension (e.g., visual imagery that aided residents to read).

Large and statistically significant results were found for facility privacy features, sensory components, and walking path in BEHAVE-D scores. Therefore, residents’ that included private rooms, had sensory stimulating activities, and included decorative walking paths lead to an improvement in participants’ BEHAVE-D score.
interviewed. Once the study was completed, participants in the control group received a book describing safety tips as well as other educational materials.

Ten occupational therapists served as the therapists in this study. All occupational therapists were licensed and had at least 1 year of experience working with geriatric individuals. Therapists completed 20 hours of training prior to the intervention.

In the intervention group, caregivers were educated on the impact of the environment on individuals with dementia. Therapists helped caregivers remove clutter and break down tasks asked of the individual with dementia (e.g., one or two-step commands). Occupational therapists helped the caregivers by providing education about excess stimulation and behavioural disturbances (e.g., agitation) in people with dementia. Intervention took place during five 90-minute sessions that occurred every other week for 3 months. During the first home session, researchers met with the caregivers and developed a targeted plan that specifically addressed aspects of daily living (e.g., dressing, caregiver fatigue). During the remaining session role-plays, interviewing, and direct observation were used to teach caregivers effective strategies to help individuals with dementia.

In the control group participants continued activities as normal. The same data were collected on both the intervention and the control groups.

Nine variables were examined, three were related to the performance of the engaged in less behavioural problems in the intervention group these differences were not statistically significant.

Caregivers reported reduced upset than in the control group (p=.049). Women caregiver also reported an enhanced self-efficacy in managing behaviours (p=.038), and minorities reported enhanced self-efficacy in dealing with functional dependency (p=.37). Also, male caregiver reported less of a decline in self-care dependence of individuals with dementia compared to female caregivers. However, these differences were not statistically significant.
individual who had dementia, while six were related to the well-being of the caregivers. The three variables measured in the persons with dementia were: the frequency of behavioural problems, the total level of dependency in activities of daily living (ADL), and the total level of dependency in instrumental activities of daily living (IADL). Behaviour problems were measured using the Memory and Behaviour Problems Checklist on a 5-point Likert scale (0 to 5 “never” to 4 to 5 “at least once a day”). The higher the score the greater the occurrence of problem behaviours. To measure dependency, caregivers rated the level of ADL using the Functional Independence Measure (FIM) which included components such as toileting, eating, bathing, dressing, grooming, and getting out of bed. Caregivers also rated level of dependence for IADLs using the FIM, and included tasks such as management of finances, telephone use, meal preparation, laundry, grocery shopping, housework, travel, and taking medication.

Two dimension of caregiver well-being were measured. The first component was self-efficacy and upset in managing behaviours, and the other was ADL and IADL dependence. Self-efficacy was defined as “an individual’s assessment of his or her ability to perform specific activities and achieve a desired outcome.” To measure situation-specific self-efficacy, caregivers rated their level of confidence in handling problems and tasks independently on behavioural disturbance, ADL dependence, and IADL dependence. Each of these three items was scored on a 5-point Likert scale (0 being “not confident at all” and 5 being “extremely confident”). The
second dimension measured was situation-specific self-efficacy, which was defined as “managing behaviours that occurred or the self-care activities in which caregiver assistance was provided.” The three items (behavioural disturbance, ADL dependence, and IADL dependence) were also measured on a 5-point scale (0 being “no upset” and 5 being “extremely upset). In addition, researchers examined differences between sub-groups within the caregivers. Differences in scoring were measured between male and female caregivers, as well as differences between minorities and non-minorities.

Chi-square and t-tests were used to find significant differences between the experimental and control group participants at baseline. Main effects of the intervention on IADL and ADL dependency, behavioural occurrences, and domain-specific caregiver self-efficacy and upset were measured at 3 months after baseline through the use of analysis of covariance (ANCOVA) with the entire sample. Separate regression analyses were used in order to measure differential effects of the intervention due to relationship, gender, or race of caregivers. All analyses were conducted using SPSS version 9.0 with the level of significance set at .05.

| Giovannetti, T., Bettcher, B. M., Libon, D. J., Brennan, L., Sestito, N., & Kessler, R. K. (2007). Environmental adaptations improve everyday action performance in Alzheimer's | The Naturalistic Action Test (NAT) was used to assess the effectiveness of environmental enhancements (or modifications) with individuals diagnosed with dementia. The NAT is a performance-based measure of an individual’s everyday actions. Participants consisted of 46 individuals who were diagnosed with dementia. To participate in this study subjects had to score under 26 on the Mini-Mental State Examination. | Based on the reports of caregivers, subjects were mildly to moderately impaired on ADL. In the Standard NAT Performance, all participant mean scores were in the impaired range. Also, all scores on the standard NAT were in the range that had been impaired. |
Examination, had to speak English, and had to demonstrate no evidence of cerebrovascular accidents or focal lesions on a magnetic resonance imaging.

Participants who were in the Everyday Action phase completed the NAT in two conditions: (1) standard and (b) user-centred. In both of the conditions, as a requirement of the NAT, participants were required to complete three tasks with minimal guidance from examiners. Tasks consisted of (a) making toast with butter and jelly and coffee with sugar and cream; (b) wrapping a gift while distracting objects were in sight, and; (c) packing a lunch box that included a snack, drink, and sandwich as well as packing a bag with necessary school supplies.

The NAT was completed exactly in accordance with the NAT manual during the standard condition. Consequently, objects were evenly distributed and were not ordered in any specific fashion. During the user-centered condition, participants completed the tasks the same way as in the standard condition; however, three environmental modifications were actualized. Firstly, objects were arranged in the order needed to complete the task. Next, objects that were used for the same step were clustered together. Finally, a call bell was placed on a red stand next to the last object in the activity. This bell had the words check your work printed on it to encourage participant task monitoring. Both the standard and the user-centered NATs were completed with participants across two sessions and were separated by more than one week but less than four weeks.

previously reported for individuals with dementia who were mildly to moderately impaired. It was found that the standard NAT scores were significantly correlated with the caregivers’ reports of participant functioning at home.

It was revealed that NAT scores were significantly increased during the user-centered condition (mean ranks of 19.6 vs 24.5) than in the standard condition. Also, a significantly decreased amount of participants scored within the impairment range during the user-centered NAT than during the standard NAT (39% compared to 67%).

It was determined that accomplishment scores were significantly increased (mean ranks of 15.8 vs 20.2) in the user-centred condition, and that the mean accomplishment score during the user-centered condition were not in the impairment range. Also, CES scores were significantly decreased during the user-centered condition (mean ranks of 19.8 vs 14.8). Still, the total time to complete the NAT was not statistically different across the conditions.
Sessions of the NAT Scoring Procedures Performance were videotaped in order for researchers to score data. The scores that were collected for both of the NATS consisted of accomplishment score, comprehensive error score (CES), total omission scores, total commission scores, completion time, and monitoring bell. The accomplishment score consisted of the total percentage of steps completed either with or without error. Scores ranged from 0 (accomplishment score of under 50% and 0 or more errors) to 6 (accomplishment score of 100% of under 2 errors made). Total scores ranged from 0 to 18, with a score under 14 indicating cognitive impairment. The CES score was the number of total errors made during the NAT. CES scores were grouped into two subsets, omission (a step was not performed) and commission (a similar object was used instead of the targeted object) errors. Completion time consisted of the number of seconds the subject worked on the NAT. Finally, subjects received one point for ringing the monitoring bell after each activity during the user-centered condition (range of 0 to 3).

The Mini-Mental State Examination, Geriatric Depression Scale, and other neuropsychological assessments were also administered to all subjects. Caregiver reports of the subjects’ everyday living skills (ADL) were also obtained.

Paired-sample t-tests were used in order to determine differences between the standard and user-centered conditions. Wilcoxon signed ranks tests were used to transform total NAT scores and (mean ranks of 21.1 vs 25.9).

Significant effects of the condition were found using a Condition X NAT Item (1 vs 2 vs 3) ANOVA with CES as the dependent variable F(1, 42) = 29.0, p < .01, and item, F(2, 41) = 93.7, p < .01, however data revealed the interaction was not significant, F(2, 41) = 0.44, p = 0.65. Post hoc analyses of the item effect were follows: Item 2 (mean rank = 88) < Item 1 (mean rank = 120) < Item 3 (mean rank = 186). Similar patterns were also shown when the accomplishment scores were analyzed as the ANOVA dependent variable: condition, F(1, 42) = 6.2, p = .02; item, F(2, 41) = 39.5, p = .01; interaction, F(2, 41) = 1.5, p = .24. The data gathered suggested that the user-centered NAT condition resulted in improved participant performance on all three items of the NAT.

During the Condition X Error Type (omission vs commission) repeated measure ANOVA significant effects were found for both of the NAT conditions, F(1, 41) = 19.3, p < .001, and error type, F(1, 41) = 21.1, p < .001, with an increased
interval level variables that were unevenly distributed. As a result, effect sizes were estimated through use of Cohen’s d calculations (2 = small; 5 = medium, 8 = large). Repeated measures analyses of variance (ANOVAs) were used to examine whether or not the user-centered condition effected a particular NAT item. The differences throughout all NAT items were measured through the use of ANOVAs with NAT condition (standard vs user-centered) and NAT item (1 vs 2 vs 3) as the independent variables that were completed. The CES was used as the dependent variable during the first ANOVA while accomplishment score was used for the second ANOVA. An ANOVA was also performed that used the error rate as the dependent variable. A difference in CES score was calculated between the user-centred and standard NAT. A negative score reflected a higher CES in the user-centered condition, while a positive score demonstrated a lower CES.

rate of commissions than omissions across both conditions (mean ranks of 106.3 vs 69.53). It was found that the interaction between Condition X Error Type interaction was not significant, F(1, 41) = .15, p = .70. The collected data revealed that both commission and omission errors decreased during the user-centered condition. Post hoc analyses that compared the error type across the two conditions demonstrated a significant decrease in substitutions (mean ranks of 18.0 vs 11.9) and additions (mean ranks of 18.1 vs 12.2) during the user-centered condition. There were no other statistically significant differences.

The results of the data revealed that were no statistically significant differences between any of the CES difference scores and neuropsychological variables (r < .27, p > .08).

In terms of the Monitoring Bell, 76% of participants rang the bell after completing at least one NAT activity. Meanwhile, 20% rang the bell after every item, 38% rang for two items, and 18% rang the bell for one item. The total amount of times a subject rang the bell (range, 0–3) was
significantly positively correlated with the participants CES difference score ($r = .36, p = .02$).

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<th>Author/Title</th>
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<td>Skrjoner, M.J., Malone, M.L., Camp, C.J., Mcgowan, A., &amp; Gozelle, G.J. (2007). Research in practice: Montessori-based dementia programming. Alzheimer’s Care Today, 8(1), 63-64.</td>
<td>Participants consisted of 78 individuals with dementia who scored less than 23 on the Mini-Mental State Examination. In this study Montessori-Based Dementia Programming (MBDP) was implemented in long-term care facilities, assisted living facilities, and adult day programs. The total number of staff members and the type of staff who completed the Montessori training varied between sites. It was recommended by researchers that staff members in multiple departments (activities, nursing, administration, social work) complete the training. Four sites were targeted in this study (two adult day centers, one assisted living facility, and one long-term care facility). Two of the four sites (one adult day center, and one assisted living facility) only wanted recreational staff members trained in the MBDP, while the other two sites trained staff members from many disciplines such as the program director and office administrator. During staff training, materials and agendas were created to use for MBDP. A 3-tiered training structure was used,</td>
<td>The results of this study revealed that MBDP can be implemented by agency staff that staff members were satisfied with the implementation of MBDP, that it is important to have staff members from all departments trained in MBDP, and that MBDP resulted in higher levels of positive engagement and lower levels of negative engagement. It was found that the two facilities which trained multiple staff members (not just recreational staff) in MBDP, resulted in higher levels of participant positive engagement and lower levels of negative engagement. During the study, family members would come to visit their loved ones in the assisted and long-term care facilities when MBDP activities were being implemented. It was found that family members</td>
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and consisted of one hour long class room sessions. In these classes, demonstrations of MBDP were given and staff practiced implementing the activities. Also, monthly meetings occurred that focused on modifying the MBDP activities.

In order to determine whether the MBDP were effective, participants were observed during two separate points in time: before and after staff training. The Menorah Park Engagement Scale was used in order to measure the four most common types of engagement displayed by individuals with dementia. Constructive engagement (CE), passive engagement (PE), non-engagement (NE), and self-engagement (SE) (described above, in the study completed by Orsulic-Jeras, Judge, & Camp, 2000). Researchers hypothesized that if the MBDP was effective then higher levels of positive engagement behaviours would be observed during MBDP than at baseline. Also, it was hypothesized that if MBDP was effective, lower levels of negative behaviours would be seen during MBDP than during baseline.

Reimer, M.A., Slaughter, S., Donaldson, C., Currie, G., & Eliasziw, M. (2004). Special care facility compared with traditional environments for dementia care: A longitudinal study of quality of life. *American Geriatrics Society, 52*(7), 1082-1092. This study was completed using a matched group trial design with follow-up assessments over a 1–year period of time. Participants resided in either the special care facility (intervention) or the traditional institutional facilities (control). The special care facility had acquired a design award from the Gerontological Environments and consisted of six separate and semi-attached bungalows, with 10 people living in each bungalow. In the intervention group, there were more staff members which increased the level of participant care. The special care facility also consisted of a biodiverse environment.

All participants who were in the intervention group were transferred from their original LTCF to the special care facility between baseline and the 3-month data collection period. However, in the first control group which consisted of individuals being transferred from one regular LTCF to another; only 31 of the 64 residents (48%) were transferred between baseline and the
environment, which included live-in pets and plants. In the special care facility the institutional environment was aligned like a regular home and residents were able to complete chores such as sweeping the floor.

Two different control groups were compared with the special care facility group. The first comparison group consisted of individuals in multiple regular long-term care facilities who were awaiting a transfer to another traditional facility. This comparison group was chosen as similarly to the residents moving into the special care facility, these subjects were also expected to experience a transfer. The long-term care facilities in this group were eight public, four faith-based, and 12 private organizations. The other control group contained individuals in a single traditional long-term care facility who were not awaiting a transfer. The purpose of this group was to imitate what was expected to happen to the participants if they had not been placed in the special care facility.

Study participants consisted of adults who were diagnosed with dementia, and scored greater than 5 on the Global Deterioration Scale (GDS). Sixty-two participants were in the special care facility group, 64 were in the first control group, and 59 in the second control group. The control and intervention group were matched based on age and GDS scores. The sample size was limited as the special care facility had a 60-bed capacity. During baseline, the subjects in the special care facility group received care in either an acute care institution, traditional institution, an assisted living center, or at home. All participants moved into the 3-month data collection period.

During baseline, no statistically significant differences were found between the three groups in sex, age, GDS score, or age-adjusted comorbidities. All participants in the three group deteriorated in GDS score during the year of follow up (p<.001). During the year follow up, psychotropic drug use did not vary between groups. Cognitive function which was measured using the BCRS declined significantly except for recent memory.

For decline of concentration, orientation, and past memory no significant differences were found between the three groups. Scores for the deteriorating of self-care and functioning revealed significant differences between the three conditions (p =.012) as well as across time (p<.001). The first control group (participants who moved to another traditional facility during the study) showed the least amount of deterioration, and the special care facility group were in the middle.
special care facility during the first few days of the initial assessment and continued to live there during the entire study. Residents who were in the first control group resided in either long-term care facilities or assisted living, with some subjects living at home during baseline. In the second control group (who did not experience a transfer during the study), participants resided in one of three geriatric units.

Quality of life (QoL) was defined as “the multidimensional evaluation, by both intrapersonal and social-normative criteria, of the person-environment system of the individual.” QoL was measured using the National Institute on Aging common core data set, which consisted of the Cohen-Mansfield Agitation Inventory (CMAI) and the Multidimensional Observation Scale of Elderly Subjects (MOSES). Cognition and activities of daily living (ADL) were measured using the Functional Assessment Staging (FAST) and the Brief Cognitive Rating Scale (BCRS). To measure state of well-being the Apparent Affect Rating Scale (AARS) was used, while participant pleasant mood was measured using the Pleasant Event Scale.

Data on QoL were collected at baseline and during 3, 6, 9, and 12 months intervals. Research staff collected data using the AARS and BCRS, while nursing staff collected the additional data using the other instruments.

Data were statistically analyzed using SPSS Version 11. A two-way repeated measures analysis of covariance (ANCOVA) was used to compare the three groups (intervention and the two controls) using four periods of assessment (3, 6, 9, and 12). For

Activities of daily living competence as measured on the FAST also significantly declined in all groups. However, the special care facility group did not decline as quickly (p=.016). Socially appropriate behaviour rated on the CMAI decreased over time in all three groups. A trend was found in the special care facility group to demonstrate more agitated behaviours from the third data collection point and onwards (p=.087).

Withdrawal from social activities increased in all three groups, as reported using the MOSES. However, increases were less in the special care group compared to the control group. Though it was noted that these differences in increases were not significant.

Pleasant mood, as measured using the Pleasant Events Scale, differentiated between groups (p=.025). The scores of all the groups decreased over time. The second control group exhibited the most deterioration in pleasant participating over time, while the first control group exhibited the least Affect which was measured using the AARS, was different between the
measures of QoL, results at the four assessment periods were adjusted and calculated using the ANCOVA with corresponding baseline QoL measure as a covariate in the analysis.

| three groups. The intervention group demonstrated the least amount of anxiety/fear (p=.003) and the most interest (p=.017).

Finally, while the total amount of time during which participants showed no response to the environment increased across time (p<.001), the increase was less for the special care facility group (p=.079). |