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Effects of Animal-Assisted Therapy on Communication, Agitation and General Health in Individuals with Dementia Living in Long-Term Care Facilities and the Secondary Effects on Their Caregivers.

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EFFECTS OF ANIMAL-ASSISTED THERAPY ON COMMUNICATION,
AGITATION AND GENERAL HEALTH IN INDIVIDUALS
WITH DEMENTIA LIVING IN LONG-TERM CARE FACILITIES AND
THE SECONDARY EFFECTS ON THEIR CAREGIVERS

A Thesis Presented to the
Graduate Faculty of the College of Education Department and the
Faculty of the Graduate College
University of Nebraska

In Partial Fulfillment
of the Requirements for the
Master of Science
University of Nebraska at Kearney

By
Jenilee Woltman

July 2021

THESIS ACCEPTANCE

Acceptance for the faculty of the Graduate College, University of Nebraska, in partial fulfillment of the requirements for the degree Master of Science, University of Nebraska at Kearney.

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Dedication

This thesis work is dedicated to my husband, Lee, who has been a constant source of support and encouragement during graduate school and life challenges. I am genuinely thankful for having you in my life. Thank you for always being there for me and willing to do whatever it takes to finish my schooling. Our kids are so lucky to have such an amazing father.

I dedicate this thesis to my siblings Tara, Tanya, Jeffrey, my father, Bob, and my closest friends who have supported our family throughout these years. Each of you have gone above and beyond to help out with the ranch and making sure the kids were always taken care of, thank you. I will always appreciate everything you have all done.

I dedicate this work and give special thanks to some of my biggest supporters here on earth, my paternal grandfather Papa Pete, and my maternal grandmother Dorothy S., you two are the best examples of hard work, patience, and unconditional love. I know that my supporters from heaven, my paternal grandmother Dorothy N., and my maternal grandfather Papa Dallas are always looking out for us. They are the reasons I wanted to do my dementia research. Thank you all for always believing in me and being the best role models that anyone could have.

Finally, I would like to dedicate this thesis to my children: Ainslee, Dallas, Raelee, and Augustus. May you always have "big, big plans" and "never give up!" Graduate school, taking care of four kids, and helping your dad on the ranch have not been an easy ride, but each of you stepped up when you needed to, and for that, I am

grateful. Most of all, I would like to thank my mother, Danette. You have always been my biggest cheerleader and are the first to make sure that I never give up. Thank you for always encouraging me and always being the first person to help out even when I did not realize that I needed it. I would not have been able to make this dream come true without you supporting our family and me. Thank you!

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I want to acknowledge and thank the entire UNK Communication Disorders Department. Special thanks go to all the staff members in CDIS for their continued support; I feel blessed that I could work with each of you, you are some of the most talented people in communication disorders, and I am fortunate to have worked with you all.

AN ABSTRACT OF THE RESEARCH PAPER OF

Jenilee Woltman, for the Master of Science degree in Communication Disorders, presented on May 4th, 2021, at the University of Nebraska Kearney.

Title: Effects of Animal-Assisted Therapy on Communication, Agitation and General Health in Individuals with Dementia Living in Long-Term Care Facilities and the Secondary Effects on Their Caregivers.

Research Advisor: Ladan Ghazi-Saidi, Ph.D.

The use of animals for therapeutic purposes has existed for centuries. However, it was not until recently that people realized the human-animal interaction has potential effects on our overall health. Human-animal interaction positively impacts humans' social, emotional, and cognitive functions (Woods et al., 2005). This research encompasses two studies. Both studies examined the therapeutic effects of an animal-assisted therapy (AAT) dog presence on communication abilities and agitation of individuals with mild to severe dementia residing in a long-term care facility. Study 1 examined agitated behaviors, communications, and social interactions of older adults with dementia living in a long-term care facility using a homemade General Health Survey (GHS), Agitated Behavioral Scale (ABS), and a Picture Recognition Activity (PRA). Study 1 showed statistically significant decreases in agitated behaviors and a statistically significant increase in social interaction and picture recognition with vs without AAT. Study 2 is a retrospective study completed on the nursing staff to examine

the potential indirect effects of ATT on job satisfaction and work-related stress levels while caring for individuals with dementia in Study 1. Study 2 indicated an increase in job satisfaction and decreased job-related stress as reported by the nursing staff when working with dementia participants who had received AAT. Study 1 and Study 2 demonstrated an increase in overall communication among all five residents with dementia on days when animal-assisted therapy was present.

This thesis has been submitted for publication in a peer-review journal in the form of an article manuscript. The same document has been submitted to the University of Nebraska- Graduate Studies in the format of a thesis as a partial fulfillment of the Requirements for the Master of Science degree in Communication Disorders University of Nebraska at Kearney.

Table of Contents

Study 1	
Chapter One.....	1
Study 1- Introduction	
Chapter Two.....	10
Study 1- Literature Review	
Chapter Three	21
Study 1- Methods	
Chapter Four.....	35
Study 1- Results	
Chapter Five.....	45
Study 1- Conclusions/Discussion	
Study 2	
Chapter Six.....	54
Chapter Seven.....	57
Study 2- Literature Review	
Chapter Eight.....	64
Chapter Nine.....	69
Study 2- Results	
Chapter Ten.....	84
Study 2- Conclusions/Discussion	
General Discussion.....	87
Study 1 and Study 2	
Appendices.....	91
Literature Cited.....	93
Study 1 and Study 2	

Chapter One

Introduction

1.1 Purpose of the Study

The purpose of this study was to examine the effects of animal-assisted therapy (AAT) and its effects on communication, agitation, and general health of persons with dementia.

1.2 Statement of the Hypothesis or Research Question

The researchers hypothesized that animal-assisted therapy (AAT) would increase dementia patients' pro-social behaviors. This study aimed to determine if AAT would have the same effect on agitation and picture recognition.

1.3 Significance of the Study

The elderly population in the United States is increasing and with it is the number of older adults with dementia. The World Health Organization (WHO) reported that the number of people living with dementia worldwide is 50 million, and this number will almost triple by 2050 (Cantarero-Prieto, 2019). Nebraska is home to an estimated 33,000 people living with Alzheimer's disease or related dementia (ADRD) and Nebraska Health and Human Services project this number to increase by 20 percent to 40,000 by 2025

(State of Nebraska, 2016). As dementia becomes more prevalent in our society, dementia-associated behavioral symptoms including agitation, depression, and aggression, will increase while memory (including picture recognition) will decrease (Perkins et al., 2008). While medication has a role in managing more severe behavior problems, there has been a growing call to focus on psychosocial methods as an alternative or supplemental intervention, particularly given the potential for adverse medication effects. Advocacy for non-pharmacological treatment of those with dementia's challenging behaviors has increased significantly in the last twenty years. One non-pharmacological treatment that has shown positive effects on decreasing agitative behaviors is animal-assisted therapy. Research has shown that pets positively affect humans' mental health (Perkins et al., 2008). This study aimed to see if AAT can be a cost-effective way to decrease agitative behaviors and increase pro-social behaviors for patients with dementia living in a long-term care facility.

1.4 Definitions

Agitation- An unpleasant state of extreme arousal. An agitated person may feel stirred up, excited, tense, confused, or irritable (Bogner et al., 2000).

Alternative therapy- A term that describes medical treatments that are used instead of traditional (mainstream) therapies. Some people also refer to it as “integrative” or “complementary” medicine. More than half of adults in the United States say they use some form of alternative medicine (Landin et al., 2008).

Aphasia- Aphasia is a disorder that results from damage to portions of the brain that are responsible for language. For most people, these areas are on the left side of the brain. Aphasia usually occurs suddenly, often following a stroke or head injury, but it may also develop slowly, as the result of a brain tumor or a progressive neurological disease (Macauley, 2006).

Alzheimer Disease or Related Dementia (ADRD)- Refers to the most common forms of dementia. Dementia likely affects more than 5 million people in the U.S. and more than 47 million people worldwide. Currently, there are no known treatments to prevent or stop the progression of dementia (Woods et al., 2005).

Animal-assisted therapy (AAT)- The utilization of animals as a therapeutic modality to facilitate healing and rehabilitation of patients with acute or chronic diseases (Odendaal, 2000).

Cognitive function- Refers to multiple mental abilities, including learning, thinking, reasoning, remembering, problem-solving, decision making, and attention (Borson, 2010).

Dementia- A general term for loss of memory, language, problem-solving and other thinking abilities that are severe enough to interfere with daily life (Sellers, 2006).

Frontotemporal dementia (FTD)- An umbrella term for a group of uncommon brain disorders that primarily affect the frontal and temporal lobes of the brain. These areas of the brain are generally associated with personality, behavior, and language (Josephs, 2008).

Lewy Bodies (DLB)- A disease associated with abnormal deposits of a protein called alpha-synuclein in the brain. These deposits, called Lewy bodies, affect chemicals in the brain whose changes, in turn, can lead to problems with thinking, movement, behavior and mood (Cabrero & Morrison, 2020).

Mean Length Utterance (MLU)- A measure of language development in young children based on the average length of utterances in their spontaneous speech. It is usually calculated by counting morphemes rather than words based on at least 100 successive utterances (Bouchard & Lalonde, 2015).

Mixed dementia- A condition in which brain changes of more than one cause of dementia occur simultaneously (Korczyn & Haperin, 2009).

Morpheme- A meaningful morphological unit of a language that cannot be further divided (e.g., in, come, -ing, forming incoming) (Bouchard & Lalonde, 2015).

Parkinson's Dementia (PD)- Parkinson's disease is a movement disorder. Parkinson's disease can cause a condition called Parkinson's disease dementia. This condition is marked by a decline in thinking, reasoning, and problem-solving (Klimova et al., 2019).

Primary effects- Effects are those which are immediate or more predictable (Primary effects, 2020).

Secondary effects- Effects which are subsequent or less predictable (Secondary effects, 2020).

Vascular dementia (VaD)- A general term describing problems with reasoning, planning, judgment, memory and other thought processes caused by brain damage from impaired blood flow to the brain (Nordgren & Engstrom, 2014).

1.5 Delimitations, Limitations, and Assumptions

1.5.1 Delimitations

For residents to be considered for this study, they first had to reside full-time at the long-term care facility: Ponderosa Villa, located in the rural community of Crawford, Nebraska. The participant had to have on their personal medical records that they had a diagnosis of dementia within the last year. The participant also had to have at least two documented episodes of agitation within the past two months of living at this facility. Medical records are often not kept current when an individual relocates into a long-term facility because the facilities often have their own daily record-keeping system. This facility used its own record forms to determine the participants' dementia severity rating and agitation rating. The facility's forms were a more current and accurate scale to assess their resident's present levels.

1.5.2 Assumptions

The majority of the accepted, validated psychometric instruments were family and the social worker of the facility. The families and the facility social worker provided much of the information on behalf of the participant with dementia. The social worker

and skilled nursing home administrator determined what participants qualified for mild, moderate, and severe dementia based on their experience and the physician's last assessment.

1.5.3 Limitations

The researchers of this pilot study did not consider that people of this demographic may struggle to touch with using one finger on a computer screen. Some of the participants could not extend their fingers and select the correct answer on the screen because they could not isolate a finger and open it to touch one of the answers on the screen. Many of the patients were only able to touch the screen with the side of their fingers, which the computer would not recognize. For these participants, the researchers had to select the answer that that participant vocalized. The order of the sessions may also be a limitation. When the session schedule was determined, each participant would have four consecutive sessions without AAT and four successive sessions with AAT, and a two-week washout between these blocks. Because of the nursing home size, all participants had to use the same session schedule. It was not realistic to have the AAT dog in the facility and work with some participants and not others. This particular nursing home had only one recreation room, where the sessions for this study took place. The recreation room is a common area for the residents; this was a determining factor of why all the participants had to be on the same schedule. Data from this study shows that AAT is most successful for moderate to severe dementia participants. Because this is a pilot study, the researchers did not factor this into the initial screening. This study also

demonstrated that AAT is successful for all agitation levels. In future studies, participants should be limited to a clinical diagnosis of moderate to severe dementia to quantify results. The study's effects did not appear to be substantially influenced by gender, co-existing mood disorder, or visitation duration.

With factoring in the limitations, there are also many positive results that the researchers felt were parallel with studies that looked at aphasia where one case study reported a shy, quiet gentleman with aphasia, generally tended not to initiate conversation with strangers. In the therapy dog's presence, the patient with aphasia became more animated and outgoing; he willingly introduced the animal to curious strangers who approached the dog or asked questions about the dog's breed or personality (LaFrance et al., 2007). AAT had been trialed in children with autism spectrum disorder. O'Haire (2013) found that the most considerable portion of research on animals and autism is focused, brief, weekly sessions. These sessions increased the children's social functioning, social awareness, social interaction and decreased social isolation (Nimer et al., 2007). Additionally, studies have found an increased general motivation (Burrows et al., 2008), improved language and communication, increased focus or decreased inattention, and reduced problem behaviors (Martin & Farnum, 2002).

Inter-rater reliability was also a limitation in this study as not all forms (ABS and GHS) were completed by the same nurses for each participant. The nurses may have had different opinions on what would be considered high agitation and low agitation, which would directly affect the score for the ABS and GHS results.

Finally, and perhaps the most significant limitation of this study is, of course, the small sample size. One may presume that a restriction would be the demographics of the participants. All five participants lived nearly their entire lives living in a rural area (population under 5,000 people) and reported that they had always owned at least one dog. It is reasonable to assume that the residents past dog ownership played a role in their participation in this study's communication outcomes.

Chapter Two

Literature Review

2.1 Animal-Assisted Therapy

Animals play a significant role in the human life experience. People commonly interact with animals in nature and may even keep them as pets. It is not a secret that many people enjoy interacting with animals, so it was no surprise when the American Veterinary Medical Association recently reported that 57 percent of households in the United States had a pet at the end of 2016. People learn so much from animals, and most may not realize how much they truly help. For many households in the United States, owning a pet had led to an overall household increase in physical activity (Wohlfarth et al., 2013). Several surveys have shown that adults who own a pet exercise more and participate in more leisure-time physical activity (Perkins et al., 2008). One study found that people who owned a dog walked more as a leisure-time activity and walked almost twenty minutes more each week than people who did not own a pet (Gillum & Obisesan, 2010). One study involving more than four hundred participants determined that dog owners had more remarkable survival (after injury or accident) after 12 months than people who did not live with dogs (Schofield et al., 2005). Animals are demonstrably a source of social support, as indicated by the number of Americans who say that the pet is “a member of the family” (Walsh, 2009). Some people talk to their pets as they would a person or consider their pet a confidant (Cain, 1983).

The benefits of animals for humans are not a new discovery. Historical evidence dating back to prehistoric times, where symbols showed a positive relationship between humans and dogs. Symbols from prehistoric times indicate that a dog's domestication was a natural process and not a unilateral decision by humans to tame them (Vigne, 2011). Historians have also reported that the Greeks were the first to use animals to lift the severely ill's spirits (McNicholas & Collis, 2006).

In the 1600s, physicians reported using animals to improve their patients' physical and mental health (Odendaal, 2000). More recently, there has been significant documentation of animals used in the 1940s by The American Red Cross on a farm where veterans suffering from injury or illness could take care of the animals to further their recovery. The American Red Cross stated that working with the animals helped the veterans put their minds on something besides war and other associated traumas (Macauley, 2006). In the 1800s, Florence Nightingale observed that small pets reduced anxiety and stress in adult and youth psychiatric patients (Odendaal, 2000). This research began a wave of informal experiments involving animal interaction with humans to produce a calming effect on patients suffering from anxiety (Fine, 2010). Dr. Sigmund Freud was so intrigued by the connection between humans and animals that he developed the Human-Animal Bond Theory (Walsh et al., 1995). This theory suggests that humans need interaction with animals, and nature normalizes one's daily life. Dr. Freud used his dog in his practice; he believed his dog could tell the most genuine character in a human and that it aided in calming young patients with anxiety (Coren, 2002).

During the 1960s, the first formal research involving animal therapy began (Ernst, 2012). Dr. Boris Levinson found that his dog positively affected mentally impaired young patients (Nimer & Lundahl, 2007). Dr. Levinson discovered that his patients were more comfortable and more likely to socialize with his dog than with other humans. It was not until Freud's findings were translated and published years after his death that Levinson's findings were considered valid (Coren, 2002). Dr. Levinson's research demonstrated the controversy that has surrounded the topic of formalized animal therapy (Mitchell & O'Donnell, 2013). The noticeable changes in human behavior and communication when interacting with animals are why Animal-Assisted Therapy (AAT) has become such an integral part of today's therapeutic practices.

Research has shown that pets positively affect humans' mental health (Perkins et al., 2008). Studies show that owning a pet can help humans live a longer, happier, and healthier life. Dogs, specifically, have been shown to reduce the risk of heart disease in their owners. For those who had suffered a heart attack, owning a dog decreased the risk of enduring another heart attack (Cole et al., 2007). Additionally, owners were alive for at least a year after the heart attack, regardless of the severity (Friedmann & Thomas, 1995). It is clear to see that animals can have a positive effect on people's mental and physical health.

The strong human and animal connection may lead one to hypothesize that animal-assisted therapy (AAT) would increase overall communication and decrease agitation for those who interacted with the AAT dog. Because of this broad hypothesis, this paper is broken down into Study 1 and Study 2. Study 1 was partially completed as

an undergraduate project in the University of Nebraska Kearney, Undergraduate Research Fellowship Program. Study 1 results were presented at the National Conference of Undergraduate Research in April 2019 (NCUR, 2019).

For this study, under the direction of Dr. Ghazi Saidi, the first author conducted this research on five residents in a nursing home and compiled these preliminary results for a poster presentation. The entire manuscript composition of Study 1, including the discussions and interpretation of the results in the context of the existing literature, had been completed as part of this thesis project. Study 2 was completed in its entirety for this thesis manuscript. Both Study 1 and Study 2 are included in this manuscript and have been completed as the thesis for the author's Master of Science in Communication Disorders.

2.2 Dementia

The United States elderly population is increasing, and with it is the number of older adults with dementia. The World Health Organization (WHO) reported that the number of people living with dementia worldwide is 50 million, and this number will almost triple by 2050 (Cantarero-Prieto, 2019). Nebraska is home to an estimated 33,000 people living with Alzheimer's disease or related dementia (ADRD) and Nebraska Health and Human Services projects this number to increase by 20 percent to 40,000 by 2025 (State of Nebraska, 2016).

Dementia is a loss of normal cognitive functions that is severe enough to interfere with daily life. Dementia is a syndrome, usually of a chronic or progressive

nature, caused by various brain illnesses that affect memory, thinking, difficulty finding words, or understanding language (Cantarero-Prieto, 2019). Symptoms of dementia can also be difficulty with attention and focusing on the task at hand, forgetting where things are or how to perform specific tasks, problems with visual perception, reasoning, judgment, and sometimes personality changes (Alzheimer's, 2018). These symptoms can vary according to the type of dementia. Most dementias are due to a gradual loss of brain cells (neurons) called neurodegeneration and are slowly progressive (Kong et al., 2009). Dementia is the result of brain disease and is not a normal part of aging.

2.2.1 Types of Dementia

As indicated above, dementia is an umbrella term. Alzheimer's disease (AD) is the most prevalent cause of dementia and accounts for 60 to 80% of dementia patients (Alzheimer's, 2018). The lesser-known common types of dementia include vascular dementia (VaD), dementia with Lewy bodies (DLB), Parkinson's dementia (PD), frontotemporal dementia (FTD), and mixed dementia (Alzheimer's, 2018).

More than 5.4 million Americans have AD; 96% of them are over the age of 65 (Alzheimer's, 2018). The incidence of AD increases dramatically with age. Alzheimer's disease is a leading cause of death in the elderly; of those who have AD by age 70, 61% will die before age 80 (Alzheimer's, 2018). The most common early symptom of AD is trouble remembering newly learned information or recent events and conversations (Burns & Rabins, 2000). AD's symptoms progress to disorientation (not remembering where you are or the date), mood and behavior changes, and confusion about when and

where events happened (Fritz et al., 1995). The confusion caused by AD can lead to unfounded suspicions about family, friends, and professional caregivers. Ultimately with AD and all other dementias, there is difficulty speaking, swallowing, and walking, and patients may become mute and unable to care for themselves (Alzheimer's, 2018).

2.2.2 Cost of Dementia

Dementia is one of the most expensive medical conditions (Hudomeit et al., 2018) and represents a substantial financial burden on society, similar to heart disease and cancer (Marcus et al., 2012). The costs associated with dementia are most typically borne by families, private insurance, and the community via public programs such as Medicaid (Hudomeit et al., 2018). Hurd et al. (2013) conducted a study of the monetary costs of dementia in the United States. This study found that dementia leads to total annual societal costs of \$41,000 to \$56,000 per case, with a total cost of \$159 billion to \$215 billion nationwide in 2010. Using these calculations, Hurd et al. (2013) suggested that the aging of the U.S. population will increase by nearly 80% in total societal costs per adult by 2040.

Dementia is overwhelming not only for the people who have it but also for their caregivers and families. There is a lack of awareness and understanding of dementia in most countries, resulting in stigmatization, barriers to diagnosis and care, and impacting caregivers, families and societies physically, psychologically and economically (Patterson et al., 1994).

6.4.4 Dementia Management

Dementia can have several associated behavioral symptoms including agitation, depression, aggression, and memory loss. (Perkins et al., 2008). Behavioral and psychological symptoms of dementia (BPSD) are common (Patterson & Bolger, 1994), are a significant source of informal caregiver ill health (Burns and Rabins, 2000). These problems are likely to become more familiar with the predicted exponential increase in the prevalence of dementia (Jorm et al., 1998). While medication has a role in managing more severe behavior problems, there has been a growing call to focus on psychosocial methods as an alternative or supplemental intervention, particularly given the potential for adverse medication effects (Cole et al., 2007). Advocacy for non-pharmacological treatment of those with dementia's challenging behaviors has increased significantly in the last twenty years (Cantarero-Prieto et al., 2019). While there are numerous non-pharmacological treatments available to health professionals, one treatment that has shown favorable results is doll therapy (Mitchell & O'Donnell, 2013). Dolls have been introduced in various countries for nursing home residents with dementia to decrease their agitation and increase affection and attachment (Mitchell & Templeton, 2014). Doll therapy remains a contentious issue as many believe it can be considered infantile, undignified, and degrading to the person with dementia (Mitchell & O'Donnell, 2013).

6.4 Dementia & Animal-Assisted Therapy

There are many forms of recreational therapies gaining ground in diminishing agitation levels of patients with dementia. One study looked at the effects of a therapeutic

recreation intervention using animal-assisted therapy (AAT) on the agitated behaviors and social interactions of older adults with dementia. The researchers of that study looked at 37 elderly residents in three nursing homes over four weeks using an experimental pre/post-test research design with three randomized groups. The residents participated in a daily AAT intervention for three weeks. During the intervention phase, the nursing staff and family members commented on how alert and responsive some of the participants were, often talking endlessly about “the dogs.” The nursing staff helped get the participants ready for the group each day before the AAT intervention. They often engaged the participants in conversation regarding the dogs about to visit and, without prompting, reminisced with the participants about past pets (Richeson & McCullough, 2002). The intervention seemed to create an atmosphere of excitement and camaraderie for everyone involved. Results showed statistically significant decreases in agitated behaviors and a statistically significant increase in social interaction pretest to post-test (Richeson, 2003). This pilot study’s outcomes indicated that a therapeutic recreation AAT intervention can decrease agitated behaviors and increase the social interactions of persons with dementia.

Study 1

Introduction

Animal-Assisted Therapy

Animals and humans have existed in therapeutic relationships with each other for more than 12,000 years (Macauley, 2006). Humans respond to pet dog's quiet interaction, which lowers the human's blood pressure and increases their neurochemicals associated with relaxation and bonding (Odendaal & Meintjes, 2003). This physiological reaction may contribute to effective pet therapy. Animal-assisted therapy has demonstrated great promise in increasing pro-social behavior and reducing agitation signs in people with dementia. Research suggests that animals communicate better than humans with dementia who have impaired language skills because animals rely more on body language (Nimer & Lundahl, 2007). AAT improves physical, social, emotional, and cognitive function in humans (McNicholas & Collis 2006).

There is evidence that a dog's presence can increase social behaviors, including smiles and laughs in AD patients when the animal is available temporarily or permanently (Batson et al., 1998). The environment is an important influence in managing challenging behaviors associated with AD. Lawton (1975) noted that the more vulnerable the individual, the more likely it is that the environment will influence them. The use of animals to assist human therapeutic activities has a long history, however, documented AAT and organized use are relatively new (Edwards & Beck, 2002 & Beck, 2000; Beck & Meyers, 1996). A few studies have evaluated the social interactions of

older adults with dementia using animal-assisted therapy. One study looked at the beneficial effects animals have on the elderly and their cognitive status. Colombo et al. (2006) examined the effects pets had on nursing home patients' Mini-Mental State Examination (MMSE) and perceived quality of life this team placed participants into three groups: group one was responsible for caring for an animal (a canary), group two was responsible for caring for a plant, group three, the control group, did not take care of a plant or an animal. After three months, there was a significant improvement in perceived health for the group that had cared for the animal (Colombo et al., 2006).

Several studies have evaluated the impact of AAT on agitation and aggression in Special Care Units, these units are designed to manage individuals' challenging behaviors with dementia. One study evaluated the effects that an AAT group activity had on patients with dementia during sundowner times (Sellers, 2006). Sundowning is a term that is used to describe behaviors such as restlessness, agitation, irritability, or confusion that can begin or worsen as daylight begins to fade—often just when tired caregivers need a break (Little et al., 1995). Results of this study found having a group AAT intervention during the time of sundowning had a positive effect on the participants' behavior and psychological symptoms, reduction in their apathy, and an improvement in their quality of life (Sellers, 2006). Walsh et al. (1995) investigated the effect of a visiting therapy dog on the behavior of patients in a psychiatric ward. Behavioral rating scale scores did not change after the 12-week experimental period. However, there were effects on blood pressure and heart rate, which were measured immediately before and after AAT sessions or at the same time of day in the control group. Heart rate was significantly

reduced in the AAT group, suggesting an AAT's calming effect. The experimental ward's general noise level was lowered due to a decrease in loud and aggressive outbursts while the dog visited.

The effects of pets on residents were investigated by Fritz et al. (1995). Based on caregivers' reports, patients with Alzheimer's disease who had pets in the home displayed significantly less verbal aggression than those not exposed to pets. Greater attachment to pets was associated with substantially fewer mood disorders, but other psychiatric morbidity measures were unchanged. Findings were unchanged when adjusted for the severity of dementia. The study's limitations included being a postal survey with a 46.8% response rate. Richeson (2003) performed a small pilot study of nursing home residents with agitated behavior who participated in daily AAT sessions with visiting therapy dogs for three weeks. Agitated behaviors decreased significantly immediately after the AAT intervention but increased when sessions were discontinued.

After reviewing these studies, the researchers hypothesized that animal-assisted therapy (AAT) would increase dementia patients' pro-social behaviors. This study aimed to determine if AAT would have the same effect on agitation and picture recognition.

Chapter Three

Methods

3.1 Subjects

This study is a quantitative multiple case study. Participants for this study comprised two males and three females who had all been diagnosed with various stages of dementia as recorded by their physicians in their medical records. The participants' ages were 76, 79, 82, 89, 91, with a mean age of 83.4 years. The participants had at least three documented agitated behaviors in the last two months, and all lived full time at the skilled nursing facility. The facility administrator helped determine the experimental research's eligible participants by reviewing potential participants' medical records. Participants received no compensation for their involvement in the study. The participants and their families received a consent form and a letter of introduction that thoroughly explained the research and its procedures. The table below shows the demographics for the participants in Study 1.

3.1 Participant Demographics

Table 1

Participant Demographics				
Participant	Gender	Age	Agitation Level*	Severity of Dementia*
1	Female	76	Mild to moderate	Moderate to Severe
2	Female	79	Moderate to Severe	Moderate to Severe
3	Male	82	Moderate to Severe	Moderate to Severe
4	Female	89	Moderate	Moderate
5	Male	91	Mild	Mild to Moderate

*Participants' agitation level and severity of dementia were determined by their medical records, director of nursing, and the social worker at the long-term care facility.

3.2. Instrumentation

3.2.1 Agitated Behavioral Scale (ABS)

The Agitated Behavioral Scale (Corrigan & Bogner, 1994) was used to document the participants' behavior during and after the therapy session. The Agitated Behavior Scale (ABS) is designed to evaluate agitation and other problematic behaviors that commonly occur during the acute recovery phase following traumatic brain injury (Corrigan & Bogner, 1994). This scale comprises 14 items of commonly occurring problematic behaviors including: short attention span, impulsivity, uncooperativeness, violence, and angry outbursts. Information from the ABS includes descriptions of the behaviors and ratings for each item and examples. It is rated on a 1 to 4-point scale based on the intensity of the behavior or frequency. When assigning ratings, the degree to which the behavior interferes with functional behavior is considered. If the behavior is absent, a rating of 1 is assigned (Corrigan & Bogner, 1994)

3.2.2 General Health Survey

The researchers constructed a homemade General Care Survey. The General Care Survey (GHS) was completed at the end of the day by one of the nurses assisting the participant. The researchers ensured that each nurse knew what forms to complete and at what times. When a nurse completed the assessments, the assessments were placed in a locked cabinet at the skilled nursing facility. Questions on the survey included questions about food intake for meals and snacks, agitation of the patient for hygiene procedures,

and the participants' interactions with nurses and other residents. The rating on the General Health Survey can be determined as followed:

- Food Intake
 - 1 -Participant did not eat that meal
 - 5 – Participant ate a normal amount of food
 - 10- Participant ate much more than normal amount of food
- Sleeping Pattern
 - 1- Participant did not sleep at all
 - 5- Participant was restless, but slept around half of the night
 - 10- Participant slept very well, and did not wake up until morning
- Bathing Process
 - 1- Participant was not compliant at all during the bathing process and oral care
 - 5- Participant was moderately compliant during bathing process and oral care
 - 10- Participant was most cooperative during bathing process and oral care
- Medication
 - 1- Participant was not willing to receive their medication (highly agitated)
 - 5- Participant was moderately agitated when taking their medication
 - 10- Participant was most cooperative when receiving their medication

A copy of the homemade GHS can be found at the end of this study and listed as General Health Survey. The General Health Survey was documented by the charge nurse approximately 24 hours after each session. A higher score indicated a more compliant patient during their daily routine. The questions asked on the survey were questions about their food intake (e.g., Did the participant eat all their food during mealtimes?). A higher score indicated that the participant had eaten more food during that time. Other questions on this survey inquired about the participant's medication intake compliance and bedtime routine (e.g., taking medication, brushing teeth, taking a bath, changing clothes). A higher score on these measures indicates that the participant was more willing to take medication freely, less resistant to taking baths, and less resistant to changing clothes.

The nursing director filled out a second Behavioral Agitation Scale and a General Care Survey for each participant approximately 24 hours after the experimental session's conclusion about the behavior and patient's agitation levels 24 hours after the testing sessions.

3.2.3 Picture Recognition Activity (PRA)

The Picture Recognition Activity (PRA) is a program developed using the software SuperLab. <https://cedrus.com/superlab/>. The data collected by the SuperLab software included reaction time that was saved in a text-only file which could be read by almost all spreadsheet or statistical software. The PRA presented the stimuli and automatically calculated the scores after the task. The PRA displayed one common picture and then listed three choices. One choice accurately described the picture; the

other two were foils. The participant selected which option they thought corresponded to the image. The PRA software collected the response time and answers from each session to be analyzed. The PRA contained ten “easy” pictures (cat, dog, mouse, chicken), ten “moderately difficult” (rabbit, shark, monkey, goat), and ten difficult pictures (owl, lynx, otter, skunk) (Davies, 2009). There was a total of thirty different images displayed on the screen. The picture recognition words were selected by their word frequency, syllables, phonemes, and neighboring density. The terms used in the PRA can be found attached to this report and listed as Picture Recognition Activity (PRA) Word List. When determining the words to include in the PRA, the researchers determined which thirty words, when read by “healthy individuals,” were easily recalled. The researchers interviewed 20 people, ten males and ten females, ranging from eight to sixty-three. In the initial interview, the author would voice the words, then let the participant read the words on a list. If any of the words were deemed “not familiar” with participants, that word was removed from the list and replaced with a more familiar word. When all words were familiar (both written and voiced) with the participants, the researchers then showed individual pictures on a computer screen to ensure that the images displayed could be easily identified. The thirty photos selected for the PRA were extensively reviewed and tested on the 20 participants. All participants were able to identify the stimuli (picture of the animal) without a word bank.

The computer used for the PRA was a large touch. If the participant was physically able, they would touch the word that matched with the animal picture displayed. Because this initial research was a pilot study, the researchers did not consider

that some of the participants would not be able to extend one finger to be able to touch the correct answer. Participants 2, 3, and 4 were able to voice their answers but could not physically “touch” the answer on the screen. For Participants 2, 3, and 4, the researchers had to touch the participants’ answers on the screen for them after they voiced their responses.

There was a total of thirty-two pictures for each session. The first two pictures were for practice and were not factored into the results. The next thirty pictures were randomized so that the participants did not have the same order of questions each time. The highest score that could be achieved on the PRA was a 30. A score of 30 would be the result of answering all pictures on the program. The participant must either voice response or touch response for the program to move onto the following picture. The minimum score would be a one because the participant would have had at least one image displayed on the screen. Table 5 shows that Participant 1 and Participant 2 had sessions where they did not respond to the first picture displayed, so the program did not display another image. One can see from Table 5 that Participant 4 and Participant 5 answered all thirty questions each session. The average of all five participants’ total responses on the PRA for sessions without AAT was 14.6. The average of total responses for sessions with the AAT dog was 22.06, which resulted in an increase of 34% for sessions that included an AAT dog. These results indicated that the participants were more likely to engage in the activity at hand when the AAT dog was present during the session. The response times were recorded for each answer; these are displayed in Table 5 in milliseconds. All five of the participants demonstrated a faster response time for

sessions that included an AAT dog. These results would indicate that each participant had a quicker automatic word retrieval when an AAT dog was present at the session.

3.2.4 Mean Length Utterance (MLU)

The mean length of utterance (MLU) is the average number of morphemes per utterance. It is an index of expressive language development used beyond the stage of single words when a person uses two or more words together in an utterance (Parker & Brorson, 2005). MLU is most commonly calculated in 100 spontaneous utterances by counting the number of morphemes in each utterance divided by the total number of utterances. Each participant had a significant increase in their MLU in sessions with AAT versus the sessions without AAT.

3.4.5 Animal Assisted Therapy Dog

The animal-assisted therapy dog used in this study was a tri-colored gentle dog named Rio. Rio was a ten-year-old, Miniature Australian Shepard, spayed female. Rio had been used in several animal handling demonstrations for local schools, and she frequently visited nursing homes, schools, and local events. She had visited residents in long-term care facilities several times in the past years and appeared to be excited when she arrived there. Rio had extensive practice meeting new people and being in unfamiliar surroundings. Rio was deemed safe to interact with elderly patients at Ponderosa Villa by Dr. Joel Robbins of Pioneer Veterinary Clinic. Before any visit to the nursing homes or

schools, Rio went through an extensive grooming routine. Grooming included brushing, which removed any debris or hair mats that could be on her coat. She was then washed with a mild pH shampoo and blown dry with a hairdryer. Her teeth, ears, and eyes were checked and assessed for cleaning. After a final all-over-the-body brushing, Rio was then ready to visit the nursing home residents. Rio was current on all her vaccinations, as recommended by her veterinarian.

The dog used in the study was a female Miniature Australian Shepherd (Mini Aussie). Females typically stand between 13 and 17 inches at the shoulder. Despite their size, Mini Aussies are a faithful herding dog: energetic, versatile, rugged, and brilliant (Young, 2017). The dog used in the study was black, white, and copper tricolor. The advantage of using this dog, in particular, is that this dog is very gentle and docile and was able to approach all ages of people. A significant factor in this study was the size of the dog. This dog was approximately fourteen inches high and weighed thirty-five pounds. Because the AAT dog was not very tall, it was difficult for the participants to pet the dog when seated in their wheelchairs. It was also more difficult for the participants to see where the dog was walking when they would be walking down the hallways. While doing the PRA, the researchers would have the AAT dog sit on a chair next to the participant for the participants to interact with the dog while performing the PRA. The researchers suggest using a larger dog to make it easier for the participants to see and touch the animal with less strain from bending over.

3.3 Procedures

After the consent forms were completed and signed, the participants and the facilitator had a “get to know you” session. For this study the researchers served as the facilitators for each session. Family members of the participants were allowed to sit in on this session to complete case history, informal language assessment, and cultural and bilingual considerations forms. These forms gathered the required demographic and medical data for this study. The “get to know you” session included a Montreal Cognitive Assessment (MoCA) Basic assessment (Nasreddine et al., 2005) and was used to assess each participant’s cognitive status and used informally to evaluate their fine motor skills.

Each participant had a thirty-minute session, two times a week, for four weeks. All sessions were recorded on video so that non-verbal responses could be transcribed and analyzed accurately. Each session consisted of a fifteen-minute introductory discussion followed by a fifteen-minute picture recognition activity (PRA). During the first four sessions, the facilitator initiated the preliminary discussion using at least one of the following phrases:

“How are you doing today?”

“It looks like you had toast for breakfast. I bet that was yummy!”

“That is a nice sweater you are wearing. Is it keeping you warm?”

After each session’s introductory period, a large touch screen was placed near the participant for the Picture Recognition Activity (PRA). The participants began the PRA

when the facilitator voiced the following phrase as the large touch screen computer was presented:

“I will show you one picture at a time, and three choices will be displayed as to what those objects are. Please select what word best describes the picture displayed. Let’s do a few practice pictures together.”

The facilitator and the participant completed two trial tasks (slides) together, so the participant understood how to perform the PRA task. After completing the two practice slides, the PRA automatically began the experimental task. The participant had a maximum of fifteen minutes to complete the task. The dog was sitting next to the participant (or on a table covered with carpet) as the participant performed PRA task. When the participant completed the experimental task, they were able to return to their daily activities. If the participant wanted to spend more time with the dog after the session, they were permitted to stay for an extra ten minutes in the room.

3.4 Data Analysis

Data for this study was reported using a quantitative analysis for each of the surveys ABS, GHS, PRA and MLU. Each survey compared the four sessions that did not include with the sessions that did include AAT.

3.4.1 ABS

Data from the ABS were calculated for each participant for the first four sessions without AAT. These results from the first four sessions (without AAT) were then used to

calculate the average ABS score for each participant. The standard deviation was calculated using these four numbers for each participant separately for the first four sessions. This same procedure was followed for sessions five through eight for the sessions that did include AAT. All calculations from the ABS were reported as five separate case studies. The averages of each of the participants' results were combined which resulted in a total average ABS score of 22.4 for sessions without AAT and 15.9 for sessions that did include AAT. Using the total averages from sessions without AAT versus sessions with AAT results in a decrease of agitated behaviors of 29% as reported by nursing staff. This same procedure was used to calculate the ABS scores during the PRA as reported by the researchers.

3.4.2 GHS

Data from the GHS was calculated similarly to the ABS as each session was reported separately for each participant. Each session resulted in a populated score approximately 24 hours after each of the eight sessions. The results from the first four sessions (without AAT) were used to calculate the average GHS score for each participant. The standard deviation was calculated using these four numbers for each participant separately for the first four sessions. This same procedure was followed for sessions five through eight for the sessions that did include AAT. All calculations from the GHS were reported as five case studies. The averages of each of the participants' results were combined which resulted in a total average GHS score of 52.5 for sessions without AAT and 63.3 for sessions that did include AAT. Using the total averages from

sessions without AAT versus sessions with AAT results in an increase of quality-of-life measures by 21.5% as reported by nursing staff.

3.4.3 PRA

The PRA resulted in scores of total responses, total correct responses, total response times and total correct answer response times for each participant and each session. All data was reported case by case and for each session. For each participant the data was combined in the first four sessions which resulted in the average scores for sessions that did not include AAT. Sessions five through eight were combined for each participant separately and averaged together which resulted in the average performance for each participant for sessions that did include AAT. The average total responses of each participants sessions that did not include AAT were combined and resulted in a score of 14.9. The average was then calculated for each of the participants' total average scores that did include AAT this resulted of a score of 21.4. The PRA resulted in a total average response increase of 30.3% for sessions that included AAT verses sessions that did not include AAT. This same format was used to calculate total correct responses, total response times, and total correct answer response times.

3.4.4 MLU

Data collected using MLU's were reported in a very similar pattern as the ABS, GHS, and PRA. For each session the utterances spoken by the participant were totaled then were divided by the total number of morphemes used in the session. Number of

utterances divided by the number of morphemes resulted in the total MLU for that session. MLU's were reported on a case-by-case table for each session separately. Each participant's first four sessions were then combined and averaged which resulted in the participants' average MLU's for sessions that did not include AAT. The standard deviation was calculated using these four numbers for each participant separately for the first four sessions. The same procedure was then used for sessions five through eight to determine the participants' average MLU scores for sessions that did include AAT. To determine the combined total average MLU's scores each participants' average scores were combined for sessions that did not include AAT which resulted in a score of 4.6. The average total MLU for sessions that did include AAT resulted in a total score of 13.85. These average total MLU scores demonstrate an increase of 66% for sessions that included AAT verses the sessions that did not include AAT.

Chapter Four

Results

This study showed a decrease in agitated behaviors using the Agitated Behavioral Scale (ABS) by 29% from the reported scores by the nursing staff and a reduction of 33.5% as reported by the researchers during the assessment sessions. The General Health Survey demonstrated an overall average increase of quality-of-life measures by 21.5%. The Picture Recognition Activity (PRA) data showed an increase in cognitive function of word retrieval by an average of 30.3%. The PRA was a method to track the Mean Length of Utterances which showed an average increase of verbal communication by 66% for sessions that included an AAT dog versus the sessions that did not have an AAT dog. These results for Agitated Behavior Score (ABS), General Health Survey (GHS), Picture Recognition Activity (PRA), and Mean Length Utterance (MLU) are provided in Tables 2-6 and can be found below.

4.1 Nursing Staff Reported Agitated Behavior Scale (ABS)

Table 2

Agitated Behavior Score 24 hours after PRA					
	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Session 1	31.00	39.00	39.00	28.00	19.00
Session 2	20.00	20.00	18.00	20.00	17.00
Session 3	20.00	22.00	20.00	20.00	17.00
Session 4	19.00	22.00	22.00	17.00	18.00
Average without AAT	22.50	25.75	24.75	21.25	17.75
Standard Deviation	4.92	6.88	7.46	3.65	0.83
Session 5	15.00	15.00	17.00	14.00	14.00
Session 6	14.00	18.00	16.00	17.00	14.00
Session 7	16.00	18.00	19.00	17.00	14.00
Session 8	15.00	17.00	17.00	16.00	15.00
Average with AAT	15.00	17.00	17.25	16.00	14.25
Standard Deviation	0.71	1.22	1.09	1.22	0.43

Notes: The ABS was recorded by charge nurse for all five participants approximately 24 hours after each session.

4.2 Researchers Reported Agitated Behavior Scale (ABS) during Assessment

Table 3

Agitated Behavior Score During PRA					
	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Session 1	20.00	22.00	22.00	21.00	18.00
Session 2	26.00	28.00	35.00	27.00	18.00
Session 3	21.00	24.00	25.00	22.00	18.00
Session 4	24.00	26.00	27.00	21.00	18.00
Average without AAT	22.75	25.00	27.25	22.75	18.00
Standard Deviation	2.38	2.24	4.82	2.49	0.00
Session 5	14.00	16.00	16.00	15.00	14.00
Session 6	15.00	18.00	17.00	14.00	15.00
Session 7	15.00	17.00	16.00	14.00	15.00
Session 8	14.00	17.00	16.00	15.00	15.00
Average with AAT	14.50	17.00	16.25	14.50	14.75
Standard Deviation	0.50	0.71	0.43	0.50	0.43

The Agitated Behavior Score had the most significant change in participants 2, 3, and 4. These participants were rated to have moderate to high agitation, as indicated by their medical records before this study took place. Participant 1 was rated as having mild to moderate agitation, and Participant 5 was rated as having mild agitation. As shown in the table above, who had a higher agitation level as reported by their medical chart demonstrated a more significant decrease in agitation behaviors for sessions that included AAT versus the sessions that did not include AAT.

4.3 General Health Survey (GHS)

Table 4

General Health Survey 24 Hours					
	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Session 1	45.00	38.00	42.00	56.00	60.00
Session 2	51.00	51.00	50.00	56.00	60.00
Session 3	47.00	46.00	49.00	54.00	61.00
Session 4	60.00	55.00	58.00	51.00	60.00
Average without AAT	50.75	47.50	49.75	54.25	60.25
Standard Deviation	5.76	6.34	5.67	2.05	0.43
Session 5	69.00	59.00	64.00	69.00	69.00
Session 6	62.00	61.00	64.00	63.00	62.00
Session 7	62.00	63.00	62.00	63.00	63.00
Session 8	63.00	62.00	63.00	63.00	60.00
Average with AAT	64.00	61.25	63.25	64.50	63.50
Standard Deviation	2.91	1.47	0.83	2.59	3.35

As shown in the table above, all five participants were more compliant with the nursing staff following sessions that included AAT. The participants with moderate to severe dementia and moderate to high agitation (Participants 1,2,3) demonstrated the most significant increase in compliance using the GHS.

4.4 Picture Recognition Activity (PRA)

Table 5

Picture Recognition Activity						
*all times are recorded in minutes						
		Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Sessions without AAT						
Session 1	Total Responses	6	3	7	30	30
	Correct Responses	0	0	4	28	29
	Total Response Time	8.615	18.443	7.063	3.706	2.118
	Average Response Time	1.436	6.148	1.009	0.127	0.071
Session 2	Total Responses	2	1	8	30	30
	Correct Responses	1	0	5	29	28
	Total Response Time	11.406	23.375	3.288	3.011	1.866
	Average Response Time	5.703	23.375	0.411	0.100	0.062
Session 3	Total Responses	1	1	10	30	30
	Correct Responses	0	0	7	28	30
	Total Response Time	9.096	7.916	13.473	3.157	1.706
	Average Response Time	9.096	7.916	1.347	0.105	0.056
Session 4	Total Responses	8	7	4	30	30
	Correct Responses	8	5	4	30	30
	Total Response Time	12.860	9.966	4.340	2.284	1.328
	Average Response Time	1.607	0.142	1.085	0.076	0.044
Average total response without AAT		4.25	3.00	7.25	30.00	30.00
Average correct answer response time		2.696	1.99	1.41	0.109	0.059

Table 5
continued

Picture Recognition Activity						
*all times are recorded in minutes						
		Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Sessions with AAT						
Session 5	Total Responses	26	5	30	30	30
	Correct Responses	15	4	25	30	30
	Total Response Time	15.227	15.556	11.585	4.499	1.044
	Average Response Time	1.607	0.142	1.085	0.076	0.044
Session 6	Total Responses	12	5	15	30	30
	Correct Responses	12	3	13	30	30
	Total Response Time	9.984	7.126	15.106	1.664	1.528
	Average Response Time	0.832	1.425	1.007	0.055	0.051
Session 7	Total Responses	24	7	27	30	30
	Correct Responses	23	6	21	27	30
	Total Response Time	14.454	6.615	15.005	2.742	1.447
	Average Response Time	0.535	0.948	0.535	0.091	0.048
Session 8	Total Responses	15	1	21	30	30
	Correct Responses	5	0	13	27	30
	Total Response Time	15.328	13.876	15.064	4.945	4.902
	Average Response Time	1.022	13.876	0.717	0.164	0.163
Average Total Responses with AAT		19.25	4.50	23.25	30.00	30.00
Average correct answer response time		1.018	2.25	1.41	0.498	0.074

Total responses increased significantly for moderate to severe dementia participants and moderate to high agitation (Participants 1, 2, 3), as indicated above in the tables. Participants with mild dementia and mild agitation (Participant 5) did not demonstrate a change in total responses because they answered each question during every session with and without animal-assisted therapy.

4.5 Mean Length Utterance (MLU)

Table 6

Mean Length Utterances (MLU)					
Sessions without AAT					
	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Session 1	2	1	1	5	10
Session 2	1	4	1	5	12
Session 3	3	1	2	8	12
Session 4	2	2	1	7	10
Average MLU no AAT	2	2.5	1.25	6.25	11
Standard Deviation	0.707	1.224	.433	1.299	1
Sessions with AAT					
	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Session 5	18	10	15	15	16
Session 6	16	11	12	15	16
Session 7	19	6	12	12	12
Session 8	17	8	17	14	16
Average MLU with AAT	17.5	8.75	14	14	15
Standard Deviation	1.118	1.920	2.121	.829	1.732

Chapter Five

Discussion

This study showed the positive effects of animal-assisted therapy on the social communication, agitation, and general health of the participants with dementia. This study also demonstrated that AAT is successful for all agitation levels.

5.1 Agitated Behavior Score (ABS)

Table 3 displays the Agitated Behavior Score (ABS) for each resident after all sessions reported by the nursing staff caring for the residents. As stated before, the ABS is a 14-item instrument that measures behavioral aspects of agitation, including aspects of aggression, disinhibition, and liability. Each item is rated on a scale from 1 to 4:

1. Behavior is not present
2. Behavior is present to a slight degree
3. Behavior is present to a moderate degree
4. Behavior is present to an extreme degree

A minimum score on the ABS is 14, signifying that the resident displayed no agitation behaviors for the 14 items. A maximum score of 56 on the ABS would indicate the resident displayed agitation behaviors to an extreme degree for each of the fourteen items. In Table 2, if each of the participants' scores were averaged for the first four sessions, which did not include AAT, their average ABS score as reported by the nursing staff approximately 24 hours after each session, this number would be a 22.4 on this

scale. According to Bogner et al. (2000), this would be considered a mild agitation score for an individual with a traumatic brain injury. However, normative data for individuals with dementia could not be found for this scale. Although the 22.4 is a mild agitation score, the residents with moderate to severe dementia (as stated by their medical charts) had an ABS score above the average of 22.4. Participant 1, Participant 2, Participant 3, and Participant 4 were all considered moderate to severe dementia. When averaging just the participants in this study with moderate to severe dementia while eliminating the resident with mild dementia (Participant 5), the average score becomes 23.56. This score indicates a moderate agitation score for Participants 1, 2, 3, 4 as reported by the nursing staff. When looking at the sessions that included AAT (sessions 4, 5, and 6), the nursing staff reported much lower agitation scores approximately 24 hours after each session for each of the participants compared to the sessions that did not include AAT. The average ABS scores of sessions that included AAT for all participants was 15.9. The 15.9 demonstrated a decrease in agitated behaviors by 29% from the sessions that did not include AAT to the sessions that did include AAT. This decrease in agitation appears to be parallel with a study by Richeson (2003) that comprised of 15 residents with dementia residing in a long-term care facility had similar results. The Richeson (2003) study showed that AAT intervention provided meaningful activity, and when that activity was removed, the need for meaningful activity was no longer being met, so the disruptive behaviors reappeared.

Table 3 shows a very similar pattern as Table 2 for the ABS when the residents completed the Picture Recognition Activity and the entirety. The data comprised in Table

3 are the ABS scores that were recorded by the researcher immediately following each session with the participants. These scores are essentially the agitation behaviors that the participant demonstrated during each session. The average ABS score for all five participants for the sessions that did not include AAT was 23.5. The average of all five participants ABS scores for sessions that did include AAT was 15.4. Table 3 demonstrated that, on average, the participants in this study had a decrease of 34.4% in agitated behaviors for sessions that included AAT versus the sessions that did not include AAT. Table 2 and Table 3 demonstrated that sessions that included the use of the AAT dog decreased each participants' agitated behaviors by a combined average of 31.7% versus sessions that did not include the use of an AAT dog. All five participants had a significant decrease in agitation behaviors. This decrease indicated that the participants were more relaxed and less irritated when the AAT was present versus when the AAT was not at the long-term care facility. The data from this study align with a recent study that found that AAT had a calming effect on the patients, which was helpful as a communication link during therapy sessions (Tribet et al., 2008). This same study found that because of its (the dog's) unconditional acceptance for dementia patients, the patients experienced an increase in their self-esteem, contributing to a more secure environment (Tribet et al., 2008).

5.2 General Health Survey

Table 4 is the data from a homemade survey that aimed to measure the quality of life for each participant and each session. This survey was called the General Health Survey

(GHS) and was completed approximately 24 hours after each session by the nurse taking care of that participant. The homemade General Health Survey was a twelve-item survey that includes questions about the participant's food intake, sleeping patterns, bathing process, and medication compliance. Each item on the survey was rated on a scale from 1 to 10. A minimum score on the GHS would result in a score of 12, which would be the result of receiving a score of 1 for each item. A 12 would signify that the individual did not eat their meals, did not sleep at all during the night or take a nap, was not compliant at all during that bathing process, and was not willing to receive their medication for the 24 hours after that session. A maximum score of 120 would signify that the participant ate more food than usual at all meals, slept very soundly during naps and night-time, was most cooperative during the bathing process and oral care, and was most cooperative when receiving their medication.

When combining the averages of the GHS survey for sessions when the participants did not receive AAT, the participants' average score was 52.5. The averages for all participants on the GHS for the sessions that did include AAT resulted in a score of 63.3. Using these averages, the participants in this study had an increase of quality of life as measured by the GHS by 21.5% on sessions that included an AAT dog versus sessions that did not. These results indicated that AAT had positive effects on the residents' quality of life up to approximately 24 hours after the sessions, as reported by the nursing staff. The results of this study seem to align with a study conducted by Nordgren & Engstrom (2014). This pilot study evaluated the effects of AAT on quality of life in people with dementia in four Swedish nursing homes. Nordgren & Engstrom

(2014) found that AAT can promote a better quality of life for people living with dementia disease and can be an effective method to temporarily reduce stress and encourage well-being for people living with dementia.

5.3 Picture Recognition Activity

Table 5 shows the results of the Picture Recognition Activity (PRA). The PRA served as the basis of the sessions. The PRA was a computer program developed by the researchers to track the patients' automatic recall for thirty different animal pictures displayed one at a time on the screen. The results from the PRA demonstrated that on average participants answered 30.3% more questions on sessions that included AAT versus the sessions that did not include AAT. The average total correct answers on the PRA showed an decrease in the average correct answer response time by 19.23%. This data indicates that on average not only did the participants respond to more questions during the PRA, they also (on average) had a faster correct answer response rate on sessions that included AAT versus the sessions that did not include AAT. Results from the PRA quantitatively show that the participants were more engaged in the activity at hand for sessions that included the AAT dog. On days when the AAT dog was not present the participants total responses, correct answer responses, and total correct answer response times on average were diminished.

As discussed in the literature review before adults with the classic sporadic form of dementia often present at an early stage with word- retrieval anomia, literal and neologistic errors, reduction in phrase length, difficulties in sentence repetition, and

impaired comprehension (Assal & Ghika, 2013). Word retrieval is a person's ability to think of the right word when they need it, such as during conversation or activity. The researchers found limited research that encompassed both word retrieval and dementia. However, there was one study that used word retrieval treatment with AAT for three individuals with aphasia. The individuals with aphasia received one semester of traditional therapy followed by one semester of AAT. While both therapies were effective, in that each participant met their goals, no significant differences existed between test results following traditional speech-language therapy versus AAT (Macauley, 2006). Results of a client-satisfaction questionnaire, however, indicated that each of the participants was more motivated, enjoyed the therapy sessions more, and felt that the atmosphere of the sessions was lighter and less stressed during AAT compared with traditional therapy (Macauley, 2006).

Using AAT in research is still a relatively new concept which may be why there are limited studies that have used picture recognition for word retrieval measures.

5.4 Mean Length Utterances

Table 6 shows the overall communication of the residents in this study. As mentioned earlier, the Mean Length Utterance (MLU) measured the increasing sentence length in individuals. MLU refers to the average length of the sentences that a child typically uses. For example, when children are first learning to talk, their MLU is often one because they only use one word at a time: "ball?", "mommy", "mine", "no". If a child uses a single word ("mine" or "no") about half of the time but puts two words

together the other half of the time (“my ball”), the MLU is 1.5. In this study, most of the residents would respond with (“uh-huh,” “ok,” or “that’s nice”) when viewing the PRA.

By calculating the MLU’s for each session, the researchers understood better the increase of verbal communication on sessions that included AAT. Table 6 demonstrates an average of 4.6 MLU’s for all five participants on sessions that did not have AAT. For sessions that did include animal-assisted therapy, the average MLU for all participants combined increased to 13.85. This increase in verbal communication resulted in an average of 67% improvement for verbal output for sessions that included AAT. An example of calculating MLU’s for sessions that did not include AAT, an average utterance may have been “that picture is a panda.” For sessions that did include AAT, a phrase may have been, “Yes, I know what that is; this picture looks like a panda to me.” The longer utterances demonstrate that the participant can more easily communicate with others when the AAT dog was present at the sessions. MLUs are not commonly recorded in studies because they can be difficult to calculate. However, one study that studies the effects of AAT on children with autism spectrum disorder found that the presence of animals on children with ASD had a positive impact on their behavior, develop a feeling of responsibility and increase the child’s ability to participate in the treatment process (Dimitrijević, 2009).

Observations

It is unknown if previous animal ownership impacted the results of the study. All of the participants’ family members had indicated that the participant either owned an

animal or had significant contact with animals during the participants life. This research was completed in a rural area, and three of the participants owned and raised livestock for several years. One participant often referred to the AAT dog as the name of their dog in the past. Training of the AAT animal is also a factor in this study. The dog used was certified therapy dog and was deemed safe work with all ages and people's cognitive states. A calm temperament was important in this study because isolated, lonely, or institutionalized people often find solace with friendly dogs and view them as empathic listeners (LaFrance et.al., 2007).

The researchers noted many benefits of having the animal-assisted therapy dog in the skilled nursing facility that was not recorded in the data. When the researchers would bring an AAT dog into the facility, many residents would come over to the author to pet the dog and even start a conversation with the handler. The participants were allowed to take the AAT dog for a walk in the facility's hallways. While walking the AAT dog, other residents would see the participants and come and walk the halls with them. The researchers did note that although the participant and residents were not talking directly to each other, they often spoke to the dog and did not seem to mind having company while walking. The facility nurses would often come and ask to use the dog to visit a resident they felt needed some cheering up. The advantage of this dog, in particular, is that she was able to go with any person in the facility calmly. The researchers noted that the nursing staff enjoyed having the AAT dog in the facility. The staff often would come over to the researchers just to pet and talk to the dog.

Conclusion

The results of this small-scale study suggest that animal-assisted therapy may, as in other areas outside the field of communication disorders, serve as catalysts for human communication. This study showed an overall average decrease in agitated behaviors by 29%, an average increase of general health measures by 21.5%, an average increase of total responses on the PRA by 30.3%, and an increase of verbal communication by 66% for sessions that included an AAT dog versus the sessions that did not include an AAT dog. Although evidence exists outside the field, little research to date has been conducted within the area of communication disorders on the role that companion, and AAT dogs offer to individuals with dementia.

Chapter Six

Study 2

Introduction

6.1 Purpose of the Study

The data collected from this study aimed to explore if animal-assisted therapy has an effect on stress level and job satisfaction amongst nursing staff working in long-term care facilities.

6.2 Statement of the Hypothesis

The researchers hypothesize that the nursing staff working with the residents with dementia will increase their job satisfaction and decrease their job-related stress levels on days the residents received AAT versus days the residents did not receive AAT.

6.3 Significance of the Study

The United States had an estimated 5.7 million people living with dementia in 2018 (Alzheimer's, 2018). With increased life expectancy, the number of adults with dementia is significantly growing. Providing care for the senior population will primarily be placed on nursing staff in long-term care facilities. The progressive cognitive and functional deterioration of residents with dementia causes many complex care problems

for staff members who work in long-term facilities (Kandelman et al., 2018). Nursing has long been considered one of the most stressful professions (Kandelman et al., 2018). The results from Study 2 will provide objective evidence to demonstrate if AAT should be considered part of a low-cost plan to diminish burnout and negative moods that are prevalent in the stressed long-term care workforce.

6.4 Delimitations, Limitations, and Assumptions

6.4.1 Delimitations

The nursing staff completed an online survey that consisted of a total of 102 questions. The questions on the survey asked the nurses to compare how they felt when working with the participants in Study 1. This survey had the staff compare how they felt on the days that their patients with dementia worked with the AAT dog versus the days their patients with dementia did not work with the AAT dog.

6.4.2 Limitations

There are several limitations to this study; the researchers recognize that there was a small sample size. Because of the small sample size results of this study cannot be generalized as public. Another limitation that one should consider is that this study was completed on the nursing staff one year after they (nurses) had worked with the participants in Study 1. This study was a small study which only consisted of only four nurses that worked in the long-term care facility of Ponderosa Villa. Lastly, most of the

nursing staff completed the survey by using their personal smartphone. It may have been difficult to see all the questions on a small screen.

6.4.3 Assumptions

Based on the literature review it is reasonable to expect that due to residents having lower agitation, increased verbal, and non-verbal communication due to animal-assisted therapy, these positive behaviors displayed by the patients with dementia would help to increase the nurse's overall job satisfaction. As the nursing staff's work-related challenges decrease, the researchers expect that the nurses will experience an increase in their job satisfaction and decrease job-related stress levels.

Chapter Seven

Literature Review

7.1.1 Long-Term Care Nursing

An estimated 900 million people worldwide are 60 years or older, and the elderly population is forecasted to grow (Alzheimer's, 2018). Increased life expectancies will lead to heightened needs for care and support of the elderly. In 2015, an estimated 46.8 million people worldwide were living with dementia (Wimo et al., 2017). This number is predicted to almost double every 20 years, reaching 74.7 million by 2030 and 131.5 million by 2050 (Hudomeit et al., 2018). As a result of increased life expectancy in both men and women, the fast-growing population over age 65 will be a challenge for health care providers, especially those who work in long-term care facilities.

Providing care for the senior population will primarily be placed on nursing staff in long-term care facilities. Nursing has long been considered one of the most stressful professions (Kandelman et al., 2018). The main stressors of nursing include long hours, heavy workload, lack of influence within the workplace, insufficient resources, role ambiguity, experiences of aggression (Zhang et al., 2017), the effects of death and dying (Hudomeit et al., 2018), and lack of support and recognition from co-workers and management (Kandelman et al., 2018). Research studies and current literature have indicated numerous factors affecting nursing staff's stress and burnout working with geriatric clients in long-term care. Factors include lack of knowledge in providing care for this population (Kennedy, 2005), conditions of work, including staffing (Bowers et

al., 2001), heavy workload (Holland et al., 2019) and taking care of clients with disabilities, agitation, or dementia (Kennedy, 2005).

7.1.2 Dementia and Caregivers

As the population ages, the number of people with dementia increases, increasing the number of nursing staff needed in long-term care facilities to care for adults with dementia. Long-term nursing staff faces many challenges in their day-to-day work (Zimmerman et al., 2005). As the number of older adults requiring nursing or residential care increases, the well-being of nurses and care workers employed in this setting grows in importance. A significant stress source identified by nursing staff members is repetitive irritants encountered daily in the caregiving role (Donoghue & Castle, 2006). The progressive cognitive and functional deterioration of residents with dementia causes many complex care problems for staff members who work in long-term facilities (Kandelman et al., 2018). Unfortunately, over 90% of dementia patients will suffer from psychiatric or behavioral issues, commonly referred to as neuropsychiatric symptoms during their disease (Majic et al., 2010). Agitation was reported as one of the frequently observed neuropsychiatric symptoms found in up to 70% of dementia patients (Volicer et al., 2012). Agitation is a behavior that may cause trouble for family members, and caregivers, and is associated with the caregiver burnout (Volicer et al., 2012).

Caring for people with dementia in long-term care has been described as emotionally and physically draining (Morgan et al., 2002) with high physical and psychological workloads (Fjelltun et al., 2009). Intense involvement with residents

identified as a stressor that can lead to staff burnout (Pitfield et al., 2011). Workplace stress in long-term care homes may be associated with psychological stress in staff and impaired care provision for the residents (Von Dras et al., 2009). An increase in staff stress and burnout levels are explicitly related to higher levels of resident aggression in nursing homes (Brodaty et al., 2003), an increase in staff control over the residents in long-term care facilities (Hunter et al., 2016), and a lower level of interaction with residents in residential homes (Jenkins & Allen, 1998). Nursing is inevitably a demanding and stressful job in a complex organizational setting, regarded as one of the most stressful occupations, associated with high levels of staff turnover, absenteeism, and burnout (Schnelle et al., 2004).

7.1.3 Animal-assisted therapy and Nursing staff

Behavioral and psychological symptoms of dementia (BPSD) are common (Patterson & Bolger, 1994), are a significant source of informal caregiver ill health (Burns & Rabins, 2000), and cause considerable distress to residential care staff (Pijl-Zieber et al., 2018). In the past few decades, AAT has gained widespread support in various healthcare settings, including critical care units, long-term care facilities, coronary intensive care units, psychiatric inpatient units, and children's hospitals (Bert et al., 2016). This alternative healing modality serves as a cost-effective means to assist patients with mental, physical, and social recovery (Kaminski et al., 2002). AAT often boosts the morale of the health care professionals and staff interacting with the animal therapists and patients. A study was conducted in an acute-care setting nurses used

therapy animals to help reorient patients to reality. In this study AAT improved patients' body image, reduced stress, stimulated comatose patients, provided emotional support, increased social interaction, decrease depression, provided comfort to both patients and families, and made the hospital environment seem more home-like (Barba, 1995).

Patients and families with pain and stress, altered physical and emotional comfort, ineffective individual and family coping, caregiver role strain, self-concept and self-esteem issues, impaired social interactions, social isolation, and altered thought processes may benefit human-animal bonding experience (Kaminski et al., 2002). The animal therapists also serve as great distracters during anxiety-provoking interventions, such as ventilator weaning, and provide the motivation needed for patients to recover (Barba, 1995).

Research on the secondary effects that animal-assisted therapy has on the nursing staff is a relatively new concept. However, many hospitals and long-term care facilities have had an informal use of animal-assisted therapy in their facilities. One reason that many facilities have not implemented an AAT program is the fear that some nursing staff has expressed. One of the fears expressed by nursing staff of an animal-assisted program is the fear of the animals transmitting infectious diseases (Miller & Ingram, 2000). In this respect, the infection prevention committee at Huntington Hospital in California reported that rigorously healthy and pathogen-free dogs did interact safely with patients: after some 3,281 visits with 1,690 children over five years, not a single infection was reported as having been transmitted by the dogs (Jorgenson, 1997). Apprehension over hypersensitivity or sensitization to animal allergens is also a significant factor that

requires the implementation of protective structures for both patients and departmental staff (Buchard et al., 2004). Even with the fears expressed by nursing staff, studies have found many benefits to reducing nurse's stress by implementing an AAT program at a hospital or long-term care facility. A recent study found a statistically significant reduction of the salivary cortisol level in nurses working in the internal medicine and long-term care department that had implemented an animal-assisted therapy program for patients and hospital staff (Machová et al., 2019). Cortisol is often used as a measurement of stress because as the body perceives stress, adrenal glands make and release the hormone cortisol into the bloodstream. Often called the “stress hormone,” cortisol causes an increase in heart rate and blood pressure. It is the natural “flight or fight” response that has kept humans alive for thousands of years (Hellhammer et al., 2009). Machová et al., (2019) found that nursing staff had lower levels of cortisol on days that the animal-assisted therapy program was in session which would indicate that the nursing staff had a reduced stress levels on these days. This study found that AAT could be included as one of the strategies to help prevent or reduce healthcare providers' stress (Machová et al., 2019).

Several major animal-assisted therapy projects have been developed for the hospital setting in the United States. "The Prescription Pet Program" in the pediatric oncology unit at The Children's Hospital of Denver, Colorado, demonstrated meaningful results described in a report by the Health Sciences Center of the University of Colorado (Dolton, 1997). Patients at an intensive care unit in Manchester, New Hampshire were visited over 17 months by eight dogs and two cats: no complications were reported and,

generally speaking, patients and families were delighted with the program (Cole et al., 2007). According to nurses that worked in the ICU department program in Manchester, they became more positive on the visiting days where their work with the child was made easier for them (Maggs & Biley, 2000). According to this study, the nursing staff used the children's relationship with the dogs as a therapeutic tool within an intervention process. In this intervention process the child takes care of the dog and centers his or her attention on the dog rather than on the aggressive interventions that may be taking place that day (McCullough et al., 2018).

Animals have long been included in health care environments for individuals with dementia. In nursing homes, there has been a movement that promotes the concept that facilities should have resident animals (e.g., dogs, cats, birds, fish) that live with the older adults and are routinely cared for by those who work or live in the home (Banks & Banks, 2002). Many hospitals and long-term care facilities now allow family pets to visit the client receiving care, as long as the treatment team agrees it is medically appropriate (Banks & Banks, 2002). According to a 2008 American Hospital Association survey, the number of hospitals offering complementary and alternative medicine services has more than doubled, from 7.9% in 1998 to 19.8% in 2006 (Buettner et al., 2011). A benefit of having an AAT program in health care facilities is the potential for interaction between the therapy animals and staff members. There are numerous anecdotal reports of decreased stress and improved morale among staff members interacting with a therapy animal. The benefit of AAT to staff members and patients is significant and promotes a healthy healing environment (Machová et al., 2019). There is limited research that has

been reported on the direct effects that AAT has had on nursing staff in long-term care facilities. Even less research has been conducted to investigate the secondary impact on nursing staff working with patients that receive AAT. This study aimed to see if AAT had positive secondary effects on nursing staff that worked directly with the participants in Study 1.

This study took place in rural Nebraska at a skilled nursing home. The nurses participating in Study 2 worked with the participants in Study 1 who had moderate to severe dementia participants and reported agitation behaviors. The participants with dementia attended eight thirty-minute sessions, four sessions without the AAT dog, and four sessions with the AAT dog. The nursing staff who worked with the dementia participants completed a questionnaire on their smartphones that was a compilation of several surveys. The surveys served as a catalyst to see if having an AAT animal directly affected caregiver nurses' job satisfaction and work-related stress levels.

Chapter Eight

Methods

Study 2 was a retrospective survey conducted in a rural long-term care facility located in western Nebraska.

8.1 Subjects.

Nursing staff in this study were direct caretakers of the participants with dementia in Study 1.

8.2 Instrumentation

This study encompassed a total of six different assessments compiled into one online survey. The surveys gathered data to compare the nursing staff's experience working with the residents with dementia on both days those residents did and did not receive animal-assisted therapy. Nursing staff completed two questionnaires that directly asked the nurses about their job satisfaction that were taken from the Job Descriptive Index (Stanton, 2002). Job in General and Work on Present Job scales from the JDI were included in this survey. Stress in General (Stanton et al., 2001) was used to assess the nurse's stress levels while working at the long-term care facility. The survey included a modified version of the Agitated Behavior Scale (Bogner et al., 2000) and a modified version of The Communication Effectiveness Index (Lomas et al., 1989). A homemade general health survey included informal questions to determine the nursing staff's opinion

of using animal-assisted therapy at this long-term care facility. All surveys included in this study assessed the nursing staff's views of the residents with dementia on days that the residents did versus the days they did not receive animal-assisted therapy.

The researchers of this study provided written information to the nurses on how to complete the surveys. The researchers of this study assured the nursing staff that the data would be collected and analyzed anonymously in the consent form. Nursing staff participants filled out the assessment tools utilizing an online Qualtrics survey. This survey was developed by the researchers using Qualtrics and gathered qualitative data <https://www.qualtrics.com/>. Because the survey was online, each of the five participants completed the assessments on their smartphones.

8.2.1 Job Descriptive Index (JDI)

The Job Descriptive Index (Stanton et al., 2002) measured the nurse's satisfaction with their jobs at the long-term care facility. The JDI was developed over 50 years ago at Bowling Green State University and updated in 2010. The JDI was commonly used in research and by several companies and employers. Information on JDI is available at <https://www.bgsu.edu/arts-and-sciences/psychology/services/job-descriptive-index.html>. A facet measure of job satisfaction allowed the participants to respond about specific facets of their job and rate their satisfaction with those specific facets (Liu, 2006).

The JDI is an appropriate tool for this project since it is a "facet" measure of job satisfaction. The facet measure enabled the researchers to measure the indirect impact of the nursing staff who take care of the residents with dementia who received AAT in

Study 1. The researchers used multiple sections of the JDI automated scoring syntax, which provided support for accurate scoring. The JDI has subtests of: Work on Present Job, Pay, Opportunities for Promotion, Supervision, People on Your Present Job, and Job in General. This survey included the subtests of Work on Present Job, and Job in General as these are the most relevant to our research survey.

8.2.3 Stress in General (SIG)

The Stress in General (SIG) was an additional measure of the nursing staff's general workplace stress level while at the long-term care facility. The SIG asks participants to select "always," "most of the time," "about half the time," "sometimes," or "never," for eight different positive and negative adjectives related to the nurse's stress levels (Stanton et al., 2001) when working at the long-term-care facility.

8.2.4 Communication Effectiveness Index (CETI)

The Communication Effectiveness Index (CETI) was developed to measure functional communication versus language ability for adults with aphasia (Donovan, 2008). The CETI is a 10 cm linear visual analog scale (VAS) that consists of 16 practical situations, which are rated from "definitely yes," "probably yes," "might or might not," "probably not," to "definitely not" (Donovan, 2008). The questions ask the nurses how easily they felt the residents with dementia could communicate their wants and needs with others. A modified version of the CETI determined the effectiveness of the

residents' communication with the nurses on days with and without animal-assisted therapy.

8.2.5 Agitated Behavior Scale (ABS)

The Agitated Behavior Scale (ABS) was developed as an assessment of agitation by treatment professionals who want objective feedback about the course of a patient's agitation (Bogner et al., 2000). A modified version of the ABS provided nurse's agitation levels when working with the residents that received animal-assisted therapy.

8.2.6 General Health Survey (GHS)

The researchers constructed a homemade survey which consisted of eight questions total. The questions on the General Health Survey (GHS) included questions asking about how easily the residents with dementia were able to communicate what they wanted to eat (or not eat), how easily the residents were able to take a nap or sleep through the night, how easy was it to work with the residents for their bathing and oral care, and how easy was it for the nurses to administer medication to the residents with dementia. Each of these questions was asked in comparison for days without AAT versus days with AAT.

8.2.7 AAT Program

The researchers constructed a homemade survey of fourteen questions to gather data about the nursing staff's observations, judgment, and opinion on the effectiveness of

the animal-assisted therapy program. This survey aimed to gather the nurse's views about the strengths and weaknesses of having AAT in their long-term care facility and suggestions on improving the program.

A compilation of all of the surveys of:

- Job Descriptive Index, Work on Present Job (Stanton et al., 2002)
- Job Descriptive Index, Job In General (Stanton et al., 2002)
- Stress In General (Stanton et al., 2001)
- Communication Effectiveness Index (Donovan et al., 2008)
- Agitated Behavior Scale (Bogner et al., 2000)
- General Health Scale (GHS)

These surveys along with the AAT program questions were compiled into an online survey using Qualtrics. The software system Qualtrics allowed survey respondents to complete surveys on their computers or mobile devices. The entire survey included 102 questions and took each respondent approximately fifteen minutes to complete. The nursing staff did have the option to reopen the survey if they could not complete the survey in one sitting. The first question on this online survey was the Nursing Staff Consent Form. This question informed the nurses they were voluntarily deciding whether to participate in this research study; if the nurses selected "agree," the survey began. If the nurses selected "disagree," then the survey would thank the nurse for their time, and the survey was terminated. The nursing staff completed this survey on their smartphones.

Chapter Nine

Results

Results from the online survey completed by the nursing staff demonstrated the nursing staff had lower agitation levels on days when AAT was present and worked with the dementia patients for whom the nurses were caring. The nursing staff reported on days without AAT, they had a shorter attention span, easier distractibility, greater inability to concentrate, and increased sudden mood changes; these behaviors were present. These behaviors were absent on days when there was AAT. Tables 7-13 are the results gathered from the survey, which was completed by the nursing staff. These results measured the secondary effects on caregivers working with individuals with dementia.

9.1 Nurse Demographics

Table 7

Demographic Characteristics Table		
Characteristic	Full Sample	
	N	%
Employment Status		
Part-Time*	0	0
Full-Time**	4	100
Volunteer	0	0
Highest Academic level completed		
High School	0	0
Associate's Degree	3	75
Bachelor's Degree	1	25

* Part-Time is considered working less than 40 hours per week.

** Full-Time is considered greater than or equal to 40 hours per week.

Table 7 is a display of the demographic data for each of the nurses that completed the survey. All four nurses were full-time (worked more than 40 hours per week). Three of the nurse's highest education was an associates degree in nursing, and one of the nurses' highest education completed was a bachelor's degree.

9.2 Job Satisfaction Index, Present Job

Table 8

Analysis of days with No Animal-Assisted Therapy versus days with Animal-Assisted Therapy						
Job Satisfaction (JDI) Work on Present Job	Number of nursing staff that responded with this answer.					
	Days without AAT			Days with AAT		
	Yes	Maybe	No	Yes	Maybe	No
Fascinating	1		3	3	1	
Routine	2		2		2	2
Satisfying		4		4		
Boring	2	2				4
Good		4		3	1	
Gives sense of accomplishment		4		4		
Respected		2	2	3	1	
Exciting		2	2	3	1	
Rewarding		3	1	3	1	
Useful		2	2	2	2	
Challenging	3	1		2	2	
Simple			4			4
Repetitive	3	1			1	3
Creative			4	4		
Dull	2	2				4
Uninteresting	2	1	1			4
Can see results	1	2	1	3	1	
Uses my abilities		1	3	3	1	

Table 8 shows the nurse's job satisfaction work on present job results. On days that the participants did not receive AAT, the nursing staff reported they did not feel "respected," "exciting," "useful," or "uses my abilities." On days where the participants with dementia did receive AAT, the nursing staff reported that they felt their job was "satisfying," "gives sense of accomplishment," "creative," and "can see results."

9.3 Job Satisfaction Index, Job in General

Table 9

Analysis of days with No Animal-Assisted Therapy versus days with Animal-Assisted Therapy								
Job Satisfaction (JDI) Job in General			Number of nursing staff that responded with this answer.					
			Days without AAT			Days with AAT		
			Yes	Maybe	No	Yes	Maybe	No
Pleasant				2	2	4		
Bad				3	1			4
Great				2	2	4		
Waste of time			2	1	1			4
Good				3	1	4		
Undesirable				2	2		1	3
Worthwhile			1	1	2	4		
Worse than most				2	2			4
Acceptable			2	2		4		
Superior				1	3	2	2	
Better than most				2	2	2	2	
Disagreeable			1	1	2			4
Makes me content				2	2	3	1	
Inadequate			2	1	1			4
Excellent				2	3	3	1	
Rotten				2	2			4
Enjoyable			1	2	1	4		
Poor				2	2			4

Table 9 shows how the nurses felt about their job in general on days without AAT versus the days with AAT. This table shows that the nurses felt as if their job was a waste of time, not worthwhile, and not superior on days without AAT. On days with AAT nurses indicated that they felt their job was pleasant, great, good, worthwhile, acceptable, and enjoyable.

9.4 Stress in General

Table 10

Analysis of days with No Animal-Assisted Therapy versus days with Animal-Assisted Therapy										
Stress In General Scale	Number of nursing staff that responded with this answer.									
	Days without AAT					Days with AAT				
	Always	Most of the time	About half the time	Sometimes	Never	Always	Most of the time	About half the time	Sometimes	Never
Demanding	2	1		1				1	3	
Hectic	2	1		1				1	3	
Calm			1	2	1	2	2			
Relaxed				3	1	2	2			
Many things stressful	1	2		1				2	2	
Pushed	2	1		1				1	3	
Pressured	2	2						1	3	
Irritating		3		1				1	1	2
Under control				2	2		3	1		
Nerve-wracking	1	2	1						4	
Hassled	2	1		1					3	1
Comfortable				3	1		4			
More stressed than I'd like	3			1					4	
Smooth-running				2	2		2	1	1	
Overwhelming		1	2	1					4	

Table 10 shows that the nursing reported on days without AAT, the nurses felt their job was “demanding,” “many things stressful,” “more stressful than I’d like” and “overwhelming.” On days where the AAT was present, the nursing staff reported that they felt their job was “better than most,” “gives a sense of accomplishment,” “worthwhile,” “enjoyable” and “under-control.”

9.5 Modified Agitation Behavioral Scale

Table 11

Agitation levels of nursing staff when working with residents with dementia.								
Agitation Behavioral Scale*	Number of nursing staff that responded with this answer.							
	Days without AAT				Days with AAT			
	Absent	Present to a slight degree	Present to a moderate degree	Present to an extreme degree	Absent	Present to a slight degree	Present to a moderate degree	Present to an extreme degree
Short attention span, easy distractibility, inability to concentrate		2	2		3	1		
Impulsive, impatient, low tolerance for pain or frustration		2	2		4			
Violent and or threatening violence toward people or property		2	2		4			
Explosive and/or unpredictable anger		2	2		2	2		
Rapid, loud or excessive talking	1	1	2		3	1		
Sudden changes of mood		1	3		3	1		
Easily initiated or excessive crying and/or laughter	1		3		3	1		

*This survey is a modified version of the Agitation Behavioral Scale (ABS)

Table 11 displays the nursing staff's self-reported agitation levels when working with dementia patients at the long-term care facility. On days that there was no AAT, the nursing staff reported having: short attention span, easy distractibility, inability to concentrate, and sudden changes of mood; these behaviors were present moderately. On days where the AAT was present and working with dementia patients, the nursing staff felt as though these behaviors were absent for themselves.

9.6 Homemade General Health Survey

Table 12

Communication of the nursing staff with the residents about the residents' general health needs.										
General Health Communication*	Number of nursing staff that responded with this answer.									
	Days without AAT					Days with AAT				
	Extremely easy	Somewhat easy	Neither easy nor difficult	Somewhat difficult	Extremely difficult	Extremely easy	Somewhat easy	Neither easy nor difficult	Somewhat difficult	Extremely difficult
How easily was it for the residents to communicate their nutritional needs with the nursing staff?			1	3		1	3			
How easy was it to get the residents to take a nap of sleep throughout the night?			2	2			3	1		
How easy was it to work with the residents for their bathing and oral care?				3	1	1	3			
How easy was it for you to administer medication to the residents?				2	2		2	2		

*This is a homemade survey, General Health Survey

Table 12 shows the relationship of how easy or difficult it was for dementia patients to communicate their general health needs with the nursing staff. On days where there was no AAT, the nursing staff reported that their patients had a somewhat difficult time communicating their health needs. On days where there was AAT, nursing staff reported that the residents could probably and definitely yes communicate their needs to the team.

9.7 Modified Communicative Effectiveness Index

Table 13

Residents Communication	Number of nursing staff that responded with this answer.		
	No	Might or might not	Yes
Do you feel as though the residents were able to communicate their emotions more easily on days when there was AAT versus days there were no AAT?	0		4
Do you feel as though the residents were able to indicate they understood what was being said to them more easily when there was AAT versus days there was no AAT?	0	1	3
Do you feel as though the residents engaged in having more spontaneous conversations (i.e., starting a conversation and/or changing the subject when there was AAT versus days there was no AAT?	0		4
Do you feel as though the residents were able to communicate physical problems such as aches and pains more easily when there was AAT versus days there was no AAT?	0	1	3
Do you feel as though the residents responded to or communicated anything (including yes or no) without words more easily when there was AAT versus days there was no AAT?	0		4

Table 13 demonstrated the residents' communication with the nursing staff on days where there was no AAT and days where AAT was present. The nursing staff overwhelmingly reported that residents could communicate their needs more easily on days when AAT was present, had more spontaneous conversation, and communicated physical problems more easily versus days without AAT.

Chapter Ten

Discussion

This investigation examined the secondary effects on the nursing staff who worked with dementia patients in Study 1. The nursing staff completed an online survey compiled of demographic information, job satisfaction, stress at the workplace, agitation levels, general health communication, and communication effectiveness for the residents.

The Job Satisfaction Surveys compared how the nurses viewed their job at the long-term care facility on days where there was not AAT versus days where there was AAT. This survey showed that on days with no AAT the nursing staff felt as though their job was boring, a waste of time and routine. On days when AAT was present, the nursing staff reported that they felt their job was fascinating, superior and better than most. These results are similar to a recent study that found a reduction of cortisol levels in nurses when an AAT dog was present at their hospital versus days when the AAT was not present (Machovia, 2019).

The nurses self-reported lower agitation levels when AAT was present versus days without AAT while caring for the participants with dementia. Staff reported on days without AAT they had a short attention span, easy distractibility, inability to concentrate, and sudden mood changes; these behaviors were present moderately. These behaviors were all absent on days when there was AAT. The results from this study's ABS scale are comparable to other studies that have measured nurse's and patients' agitation levels

during AAT. Woods et al. (2005) found that therapeutic touch on dementia patients directly affected the nurses who worked with these patients. This study found that therapeutic touch, when used on dementia patients, reduced caregiver distress by decreasing the patients' disruptive vocalization and restlessness (Woods et al., 2005). Another study evaluated the effectiveness of dog contact using a range of physiological measures, including blood pressure, diastolic blood pressure, heart rate, skin temperature, and CgA (an antibody found in saliva thought to be an indicator of stress). Walsh et al., (1995) reported a significant decrease in the average heart rate (but not blood pressure) of participants in the treatment group from pre- to post-intervention. This study reported a substantial reduction in noise levels in the treatment ward due to a decrease in loud, spontaneous vocalizations and aggressive verbal outbursts in the treated group (Batson et al., 1998).

Perhaps the most significant assessments conducted in this study were the general health and effective communication scale. These scales had indicated a substantial increase in communication from dementia patients when they had received AAT. These scales showed that the patients could more easily communicate their emotions, aches, and pains, and engage in spontaneous conversations on days when AAT was present. This increase in communication from the residents had an indirect effect on the nursing staff by more effectively caring for their patients because could more easily communicate their needs. Zwijsen (2011) found similar positive results for nursing staff from implementing a behavioral management program for dementia patients. The researchers could not find any studies that examined the indirect impact on nursing staff with increased patient

communication. However, there are a few studies that are looking into the human–animal bonding theory such as attachment, social support, or role theory (Fine, 2010). This theory has shown the most benefit from regular dog contact delivered in a therapeutic manner (as opposed to activity) in a small group setting over a longer timeframe to allow time for attachment to develop, and to encourage participation in the small group process (Beck & Katcher, 2003). Human-animal bond theory may assist in understanding the mechanisms underlying dog-assisted therapy/activity, outcomes, construction of suitable session plans, a protocol for each species with emphasis on animal welfare, and participant selection (Perkins et al., 2008). However, this theory does not include secondary effects animals have on nurses who work with the patients that received animal-assisted therapy. More research is needed to determine these secondary effects on nursing staff.

The AAT Program questioner asked what the nurses' overall opinion was about having AAT in their facilities working with some of their patients. The nurses indicated that they enjoyed having the AAT visit the long-term facility, and they did not have any suggestions on how to change the program. One nurse wrote that she liked having the AAT dog in the facility because it "Made my job easier and more enjoyable." When the nurses were asked what they liked about AAT, one nurse stated, "It is amazing how the resident's mood improves. People who can't remember what day it is "know" the therapy animal's names, their handlers, etc." It is reasonable to believe that the nursing staff enjoyed the AAT dog being at the facility and working with the residents with dementia.

Conclusion

This study indicated positive secondary effects on the nursing staff who worked with participants with dementia in Study 1 on days when participants received animal-assisted therapy. The results from this small study revealed that the nursing staff enjoyed their job more on days when the AAT dog was present and working with participants with dementia. The nursing staff did not report that having an AAT dog at the facility caused more work for the nursing staff. This study showed that having an AAT dog working with the participants with dementia made the nursing staff's job "easier" and "more enjoyable," as indicated on the surveys the nurses completed.

General Discussion

Study 1 and Study 2

Study 1 and Study 2 both demonstrate positive effects of having animal-assisted therapy in a long-term care facility for both the residents and the nursing staff. The researchers predict that one reason why animal-assisted therapy has a positive effect on the participants with dementia and the nursing staff, might be as simple as looking at the five basic human senses: touch, sight, hearing, smell, and taste (Haraway, 2003). These five senses are how humans explore our surrounding environments. The senses could help to explain as to why the participants and nursing staff in Study 1 and Study 2

connected so well with the animal-assisted therapy dog. The five senses may be the answer as to why animal-assisted therapy can be so influential to humans.

When the dog first approached a participant or staff member in the nursing home, much of the time, whomever the dog came to would reach out and either touch the dog's smooth and soft fur or reach for the textured leash. The recipient identified these different textures by the sense of touch. Touch consists of several distinct sensations communicated to the brain through specialized neurons in the skin. Pressure, temperature, light touch, vibration, pain, and other sensations are all part of the touch sense and are all attributed to different receptors in the skin. (Muthukumarana et al., 2020). It would appear then that the cognitive capacities of touch, which was among the first of the sensory systems to evolve in humans, has recently been discovered to leave a memory trace that persists long after the physical sensation is gone (Ramachandran & Hirstein, 1998). Studies have shown that the information appears to be stored without much conscious awareness; the individual may not be able to verbalize how something felt, but they will recognize it by grasping it or looking at it (Muthukumarana et al., 2020). Neuroimaging studies have found that touch not only activates the somatosensory cortex but can also activate regions that are involved in processing visual signals (James et al., 2002). When touching an unseen object, the brain forms a mental image of its probable appearance. This experience may be especially likely when an object resembles a familiar item that one may have encountered before (Lacey et al., 2010). When an object that the individual comes in contact with for the first time, they can recognize it based on touch. Several studies have provided important implications for nursing practice in persons with

dementia regarding physical touch. Physical touch with verbalization has reduced anxiety and dysfunctional behavior for those with dementia (Kim & Buschmann, 1999). Touch is one example where the animal used in AAT does make a difference. It is reasonable to hypothesize that when a participant or one of the nurses touched the dog at the long-term care facility, it brought back memories they had of having a dog in the past.

The smell may have also been a contributing factor that helped to alleviate agitation and increase communication with the participants and staff in these studies. Dogs tend to have a distinct odor that may have triggered fond memories for the subjects. Olfaction, which is the sense of smell, is highly associated with learning (Croy et al., 2012). Some studies suggest that olfactory sensory abilities even play a role in visual memory (Olofsson et al., 2020). There have been a few studies that have looked at humans' use of smell for learning. One study used olfactory training and improved participants' performance on odor discrimination and naming tasks (Olofsson et al., 2020). It is reasonable to presume that the dog's smell may have triggered a pleasant visual memory for the participants and nursing staff close to the AAT dog.

The sense that may be the most important to both Study 1 and Study 2 when looking at the human and animal-assisted therapy dog bond is the sense of sight. Dogs can look at people and maintain eye contact. The look that dogs often give people is hard to describe, yet many people who own a dog say that one of the best parts about a dog in their life is having a friend that is there whenever they are needed and their non-judgmental affection. Psychologists have found that dog's loyalty and non-judgment is

something that humans crave and love from dogs (Haraway, 2003). Many pet owners believe they not only give but receive love and affection from their animals (Patroneck et al., 2009). The love and affection that dogs give their pet owners may be part of this look that dogs can give to humans. Cusack (2014) contends that animals serve as confidantes with no risk of betrayal.

Dogs might be afraid, they might be excited, they might be sad or relaxed, but their looks will never be judgmental. Perhaps the look that the AAT dog gave to the participants in this thesis brought back the memories of a loyal dog they had in their past who made them feel unconditionally loved. In addition to the joy that the AAT dog brought to the residents, the positive impact the AAT dog had on the participants with dementia and the beneficial secondary effect on their caregivers indicates that AAT should be considered part of a cost-effective way to decrease agitation and increase communication for those living in long-term care facilities.

Appendices

Attachment 1

Picture Recognition Activity (PRA) Word List

Difficult Words

word rank	Word	Phonetic	PoS	Frequency	Syllables	Phonemes	Familiarity	ND*
28136	Ladybug	/leɪdɪ bʌg/	N	220	3	7	10	0
28096	Koala	/koʊˈɑlə/	N	219	3	5	10	0
25317	Bumblebee	/bʌmbəl bi/	N	263	3	8	10	0
24630	Walrus	/wɔlrəs/	N	270	2	6	10	0
21843	Bobcat	/'bɒb,kæt/	N	606	2	5	10	0
22836	Yak	/jæk/	N	324	1	3	10	9
20875	Porcupine	/pɔrkjə,pain/	N	451	3	9	10	0
20174	Sloth	/sloʊθ/	N	437	1	4	10	3
18949	Llama	/lɑmə/	N	614	2	4	10	1
22660	Badger	/bædʒər/	N	325	2	5	10	3
				Average	2.2	5.6		1.6

Moderately Difficult Words

word rank	Word	Phonetic	PoS	Frequency	Syllables	Phonemes	Familiarity	ND*
16356	Kangaroo	/kæŋgəˈru/	N	872	3	7	10	1
16073	Octopus	/ɑktəˈpʊs/	N	776	3	7	10	0
16035	Giraffe	/dʒəˈræf/	N	860	2	5	10	1
15899	Grasshopper	/græs,hɑpər/	N	761	3	9	10	1
15238	Panda	/pændə/	N	908	2	5	10	0
15120	Skunk	/skʌŋk/	N	738	1	5	10	4
12691	Raccoon	/ræˈkʊn/	N	1045	2	5	10	1
11981	Penguin	/peŋgwən/	N	3371	2	7	10	1
9688	Donkey	/dʌŋki/	N	1706	2	5	10	2
9570	Gorilla	/gəˈrɪlə/	N	471	3	6	10	1
				Average	2.3	6.1		1.2

Easiest Words

word rank	Word	Phonetic	PoS	Frequency	Syllables	Phonemes	Familiarity	ND*
5386	Dinosaur	/daɪnəˈsɔr/	N	4744	3	7	10	1
4978	Butterfly	/bʌtərˈflaɪ/	N	5440	3	8	10	0
4610	Monkey	/'mʌŋki/	N	5698	2	5	10	3
4420	Rabbit	/ræbət/	N	6095	2	5	10	3
4405	Elephant	/eləfənt/	N	6038	3	7	10	1
4276	Whale	/weɪl/	N	6928	1	3	10	5
4253	Sheep	/'ʃi:p/	N	6320	1	3	10	6
4192	Wolf	/wɔlf/	N	6718	1	4	10	3
1546	Chicken	/'ʃi:kən/	N	24465	2	5	10	1
950	Fish	/'fɪʃ/	N	41488	1	3	10	5
				Average	1.9	5		2.8

Attachment 2

General Health Survey

Scale	1 Not willing				5 As usual				10 Most cooperative	
	Did the participant eat more or less than they would consume? Please circle 1- DID NOT EAT, circle 10 MUCH MORE than normal.									
Food Intake										
Lunch	1	2	3	4	5	6	7	8	9	10
Snack	1	2	3	4	5	6	7	8	9	10
Dinner	1	2	3	4	5	6	7	8	9	10
Breakfast (next day)	1	2	3	4	5	6	7	8	9	10
Notes:										

Sleeping Patterns	How well did the participant sleep at night and during their naps? Please circle 1- did NOT SLEEP at all, circle 10- VERY SOUNDLY									
Naps day of	1	2	3	4	5	6	7	8	9	10
Night	1	2	3	4	5	6	7	8	9	10
Next day nap	1	2	3	4	5	6	7	8	9	10
Notes:										

Bathing Process	Was this participant more willing and less resistant to bathing and oral care? Circle 1- NOT WILLING to bathing and oral care, circle 10-MOST COOPERATIVE and compliant to care									
Night care	1	2	3	4	5	6	7	8	9	10
Morning care	1	2	3	4	5	6	7	8	9	10
Notes:										

Medication	How well was participant willing to receive medication? Please circle 1-NOT WILLING at all, circle 10- MOST COOPERATIVE, more than normal.									
Noon	1	2	3	4	5	6	7	8	9	10
Night	1	2	3	4	5	6	7	8	9	10
Next morning	1	2	3	4	5	6	7	8	9	10

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