ORIGINAL RESEARCH

Animal assisted therapy for elderly residents of a skilled nursing facility

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ABSTRACT

There is a growing population of those with dementia and other cognitive impairments that affect the quality of life. This is attributed to advances in science, technology and medicine leading to reductions in maternal mortality, infectious and parasitic diseases, occupational safety measures, and improvements in nutrition and education of the global population. According to the Administration on Aging (AoA), an agency of the U.S. Department of Health and Human Services in 2000, approximately 605 million people were 60 years or older. By 2050, that number is expected to be close to 2 billion. Animal assisted therapy (AAT) has been used as a therapeutic activity among the elderly to help improve well being and quality of life, but there has been limited research to demonstrate its effectiveness among those with dementia. The purpose of this study was to compare the effectiveness of AAT versus human interaction only on social behaviors and engagement among elderly patients with dementia in long-term care facility. Following random assignment to groups, the participants experienced two visits per week over a two-week time period of either animal therapy visits or human interaction visits. One week with no activities then followed then with alternate animal therapy and human interaction visits. The human interaction visits consisted of conversation and reading from and looking at pictures in a newspaper. During animal visits, participants were encouraged to touch, pet, brush, and talk to the dogs. In this study, AAT increased positive social behaviors resulting in fewer incidents requiring staff intervention. AAT coincides with current goals in long-term care settings - improving and enhancing socialization behaviors among older adults with dementia.

Key Words: Animal assisted therapy, Behavior, Dementia, Engagement

1. INTRODUCTION

As the population of older adults is increasing, there is a concomitant growing population of those with dementia and other cognitive impairments that affect quality of life. Animal assisted therapy (AAT) has been used as a therapeutic activity among the elderly to help improve well-being and quality of life, but there has been limited research to demonstrate its effectiveness, especially among those with dementia.

Dementia is a loss of previous levels of cognitive, executive, and memory function in a state of full alertness. Dementia develops slowly and is characterized by multiple cognitive deficits that include memory impairment. Primary dementia is irreversible. Alzheimer's disease (AD), the most common form of dementia, is a progressive disease for which there is no cure. Because there is currently no successful cure or method of prevention, the primary goal of most interventions is to maintain function and improve quality of life.[1] Social and recreational activities are important for achieving these goals. Implementing appropriate activities for people with dementia is challenging due to cognitive and communicative impairments. One way to promote interaction is through animal assisted therapy.

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AAT involves using animals as a fundamental part of a person's treatment and as therapeutic and social agents to improve well-being. AAT can affect various behaviors associated with dementia. Stimulation from the animal can decrease withdrawal, improve short-term memory, trigger long-term memory, and enhance communication skills.[2] The literature identifies many positive results from AAT studies conducted with people with dementia.

A repeated measures exploratory study evaluated the effect of an animal-assisted activity with dogs for ten patients affected by dementia in an adult day care center. Researchers measured cognition, behavioral and psychological symptoms of dementia, emotional status, and motor activity. Participants were evaluated for two weeks pre-intervention then participated in a three week intervention with plush dogs followed by a three week animal-assisted activity. Researchers observed an increase in pleasure and general alertness and a decrease in sadness with the animal-assisted activity. The decrease in sadness persisted for several hours after the session with the dog. While depressive symptoms were reduced during the animal intervention, the decrease did not reach a level of significance. Participants did have significant decreases in anxiety compared to the control conditions. The animal-assisted activity contributed to increased motor activity of the participants.[3]

Another study evaluated the effects of an animal-assisted therapy intervention on elderly nursing home patients affected by psychiatric diseases including dementia. Participants held, stroked, walked, talked to, and played with dogs during 90-minute weekly sessions. Control subjects saw dogs enter the nursing home, but were not allowed to formally interact with them. Depression scores improved for both groups with no significant differences between groups. Improvements on a mental state exam were noted for both groups, but only the intervention group had significant improvements.[4]

A study to evaluate nursing staff members views on the benefits, risks, behavioral responses and significant changes associated with a therapy dog program found overall positive responses. Staff noted increased interaction between residents with Alzheimer's disease and the dog, other residents, staff, and visitors. Residents laughed, smiled, and expressed comments more often in the presence of the dog. Staff also reported increased environmental awareness among some residents during visits with the dog. Nursing staff felt the dog provided a positive diversion, promoted a homelike unit atmosphere, and provided a means to relate to others.[5]

A study of 56 nursing home residents with a diagnosis of dementia compared the impact of a variety of dog-related stimuli on engagement and attitude. Researchers found that all types of dog-related stimuli improved engagement. Watching a puppy video kept residents engaged for the longest amount of time followed by real dog interaction. Other activities also improved engagement for a shorter length of time including interaction with a robotic dog and plush dog and a dog-coloring activity. The attitude of residents was most positive toward interaction with real dogs. Researchers concluded that visits with dogs can improve engagement in residents with dementia, but other dog-related activities can also be incorporated to further promote engagement.[6]

A randomized controlled trial investigated the efficacy of AAT on symptoms of agitation, aggression, and depression in nursing home residents with dementia. Participants were assigned to a usual care control group or a usual care plus AAT group. After ten weekly AAT sessions, intervention group participants demonstrated constant frequency and severity of agitation, aggression, and depression while these symptoms significantly increased in the control group. This study indicates that AAT may delay progression of symptoms in people living with dementia.[7]

Literature reviews conducted to evaluate AAT studies reveal that AAT produces effective results among people with dementia. A literature review of dog visitation therapy in dementia care found that pet therapy has a significant effect on the psychological wellbeing of older adults including those experiencing dementia. Benefits identified in the review included improved social interaction, pleasure, laughter, enjoyment, non-verbal, and tactile outcomes. Additionally, psychosocial function, social competence, and symptoms of depression may be improved. The review also identified gaps and limitations in AAT research including the low number of sound quantitative studies, lack of clearly defined study protocols, and small sample sizes.[8] A second literature review also concluded that dog contact is beneficial for people with dementia due to increased social behaviors and decreased agitated behaviors. The benefits, however, appear to be modest and short-lived. Similar to Williams and Jenkins, these authors also noted multiple limitations due to methodological variability among animal-assisted therapy studies.[9] Finally, in a third review, AAT interventions reduced agitation, improved the degree and quality of social interaction, and positively affected communication and coping ability. The authors identified large variations in study design, type of intervention, and duration of reviewed studies as a limitation of the review.[10]

2. METHODS

A commonly cited criticism of AAT research is its anecdotal nature with concomitant low-level research designs. To address this concern a controlled trial with randomized

cross-over experimental quantitative design between conditions study was conducted to compare AAT with human interaction in improving the social outcomes of persons with dementia living in long-term care facilities. Specifically the study aimed to compare the effectiveness of AAT versus human interaction only on social behaviors and engagement among elderly patients with dementia in a long-term care facility.

2.1 Ethical considerations

University Institutional Review Board and Institutional Animal Care and Use Committee approval were obtained for the study along with approval from the participating skilled nursing facility. Participating families were contacted by agency staff to determine if they were interested in their loved one participating in the study. Following agreement, a phone call was made by researchers to each family to explain the study and answer questions. A consent form was then signed by the family member. The residents then had the study explained to them and those that were capable also signed and/or gave verbal assent. Residents also gave verbal assent to each visit or the visit was not conducted.

2.2 Participants

Forty-four residents from a skilled nursing facility with a diagnosis of primary dementia; 24 female and 20 male, aged 35 to 98 years (M = 79.8), living at a health and rehabilitation center in a Southeastern state were observed during both AAT visits and human interaction visits. Determination of dementia was confirmed by individual chart review. The level of severity ranged from minor to severe throughout the spectrum.

Residents were from a variety of socio-economic backgrounds, ethnicities, and cognitive abilities and the center is representative of skilled nursing facilities throughout the state. See Table 1 for participant demographics.

2.3 Program description

Participants were assigned in random order to AAT or human interaction (control) blocks. Following random assignment to groups, the participants experienced two visits per week over a two-week period of either animal therapy visits or human interaction visits. Following a one-week break with no activities, participants in the AAT group received human interaction visits and those in the human interaction group received AAT for an additional two visits per week for two weeks. Intervention visits were 10 minutes in length with observations occurring 10 minutes prior, 10 minutes during the visit and 10 minutes post visit for a total of 30 minutes.

2.4 Animal intervention

Six dogs, ages two to four years, trained in AAT, were used to engage the participants. Both large, 36-70 pounds, and small, 12-35 pounds were used in the study. Animals used in the AAT were temperament tested and trained in AAT, checked by a veterinarian to ensure they were free from all diseases, current on all vaccinations, and bathed and groomed the day of the visit. During animal visits, an animal handler accompanied the dog during the session, but did not interact with the resident. Sessions took place wherever the resident was located: in their room, in the social room, or on occasion in the hallway. Participants were encouraged to fully interact with the dog. The animals were allowed to engage the participants in ways the participants desired. The dogs' natural desire for human attention and the human-animal bond were used to guide the visits, based on the ability of the participant. Interactions included touching, petting, brushing, holding, talking to and playing with the dogs.

Table 1. Demographic details of the participants

Demographic variable	N = 44	Percent
Age		
60s	9	20.5%
70s	13	29.5%
80s	18	40.9%
90s	4	9.1%
Race		
Caucasian	27	61.4%
African American	17	38.6%
Gender		
Male	24	54.5%
Female	20	45.5%
Marital Status		
Single	10	22.7%
Married	4	9.1%
Widowed	26	59.1%
Divorced	4	9.1%
Education		
Some High School	10	22.7%
High School Graduate	13	29.5%
Some/Graduate College	8	18.3%
Unknown	13	29.5%
Have had a Pet		
Yes	17	38.6%
No	7	15.9%
Unknown	20	45.5%

2.5 Control intervention - Human visits

To control for the attention of the dog intervention, a human interaction intervention was developed. The intent was to offer a one-on-one interaction that was neutral. The control intervention consisted of engaging the resident by means of general conversation and, reading from and looking at pictures in a newspaper. This intervention offered equivalent personal attention and could easily be replicated in each

human visit. If interaction was not possible, the person delivering this intervention remained with the participant the full 10 minutes reading out loud from the paper.

2.6 Instruments

The four instruments used in data collection were the Demographic and Pet History Questionnaire, the Social Behaviors checklist to rate behavior pre, during and post visits, the Menorah Park Engagement Scale (MPES) to rate the level of engagement for each participant at the end of each visit, and a weekly measure of behavior using the Cohen-Mansfield Agitation Inventory (CMAI).

The Demographic and Pet History questionnaire is a 10-item questionnaire to collect basic demographics as well as the resident's history of pet ownership including type of pet, enjoyment of being with the pet, and importance of pets in their life.

The social behaviors checklist was developed based on modifications from an observational checklist with established validity in persons with dementia.[5] It included 13 social behaviors, six positive and seven negative. In each one-minute observation, if a behavior, positive or negative, occurred in that one-minute period, it was recorded. Both positive and negative behaviors were then summed to form a social behavior score. A total social behavior score was determined by calculating the difference between number of positive behavior traits observed and number of negative behavior traits observed during each visit.

The Menorah Park Engagement Scale distinguishes between four types of engagement: 1) non-engagement which is described as a blank stare or attending to things other than the activity presented; 2) self-engagement, engagement within the self, including engagement displayed with agitated behavior; 3) passive engagement, the person is watching or listening to the activity presented; and 4) constructive engagement where the person is actively involved with the facilitator or activity with speech and/or actions such as pointing, touching or handling something in the activity.[11] This scale has been used and validated in multiple studies to assess engagement in patients affected by dementia.[12–15] The current study established interrater reliability over .90 for all raters.

In addition, the Cohen-Mansfield Agitation Inventory was completed after each two-week intervention period by the researcher in discussion with the long-term care facility staff in closest contact with the resident. This scale assesses the frequency with which elderly persons manifest physically aggressive, physically non-aggressive, and verbally agitated behaviors.[16] Although this questionnaire originally consisted of 29 agitated behaviors, the present study utilized the short form version of the CMAI.[17] This consists of 14 agitated behaviors, each rated on a 5–point frequency scale instead of a 7–point frequency scale. The scale is rated from 1–5 ('1' indicates that the person never exhibits the agitated behavior, and '5' indicates that the person engages in the behavior a few times an hour or continuous for half an hour or more). This scale relies on subjective information given by the rater. For the short version of the CMAI, inter–rater reliability was as follows: exact agreement = .82; 0–1 point discrepancy = .93. These coefficients and previous studies indicate good internal consistency reliability of the tool with Cronbach's alpha values greater than 0.85.[18]

2.7 Data collection

Following consent and prior to visits, the resident or family member completed the Demographic and Pet History Questionnaire. For both animal and human visits, a trained observer used a Social Behaviors checklist to record the positive and negative social behaviors. The interaction observers were discreetly positioned and recorded the behaviors at 1-minute intervals for the 10 minutes pre-interaction, during interaction, and post-interaction for a total of 30 observations per visit.

To achieve inter-rater reliability with observers, training was held prior to data collection. Two videos were prepared with several segments demonstrating different responses to both dog and human interactions. Observers participated in two or more training sessions in order to achieve a > 80% inter-rater reliability with the pre-determined scores from the videos. Overall inter-rater reliability for the study was 85%.

2.8 Data analysis

Each data collection instrument was scored and data was entered into a database created using Microsoft Access®. All analyses were carried out using SAS 9.3, a statistical analysis software package and an alpha = .05 level of significance. Descriptive statistics were conducted and an Anova fixed effect model with two treatment levels: human interaction (HI) and AAT was run. When the Social Behavior score data did not meet assumptions for a normal distribution, the scores for each participant were ranked from lowest to highest and the Kruskal-Wallis test was run.

3. RESULTS

Means for behavioral scores are presented in Table 2. Both animal and human interaction significantly improved the behavioral scores during the interaction ($p < .001$).

Table 2. Behavioral score means by time period and visit

	Overall Mean	AAT Mean	HI Mean
Pre-therapy	16.19	15.83	16.54
Therapy	37.35	41.87	32.86
Post-therapy	18.75	19.17	18.33

The type of therapy provided has a significant effect on the social behavior score of the participants, with the participants receiving AAT having a better score (see Table 3).

Table 3. Kruskal-Wallis Results for Comparison of Social Behaviors by Type of Interaction

Type of Interaction	N	Mean	KW χ^2 statistic	p
Animal	133	157.08	23.68	p<.001
Human	134	111.09		

Since a crossover trial was conducted, analyses were conducted to determine if a sequence effect existed. The sequence effect was not significant.

To measure differences in participant's engagement in activities during the visit measured on the MPES, a Chi-Square analysis was conducted between dog and human visits on the level of engagement. Although AAT visits resulted in greater expressions of pleasure than human visits and lower inappropriate responses such as turning away or refusing to interact, the type of therapy did not have a significant effect on the engagement level of the participants (see Table 4).

Table 4. Menorah Park Engagement Scale

Type of Visit	Not engaged	Self or other engaged	Passive engagement	Constructive engagement
Animal	6 (2.3%)	7 (2.7%)	42 (16.3%)	70 (27.1%)
Human	13 (5.0%)	7 (2.7%)	52 (20.2%)	61 (23.6%)
Total	19 (7.4%)	14 (5.4%)	94 (36.4%)	131 (50.8%)

Note. $\chi^2 = 4.02$, p = .26

A t–test was used to compare the groups on the scores for the CMAI aggressive and non-aggressive and verbal behavior categories. Similarly, although the weeks the dog interactions were occurring revealed lower scores, no significant differences existed overall on the CMAI (see Table 5). However, a significantly lower score on the screaming and verbal aggression item was noted in the weeks of the dog visits ($t = 3.2$, $p = .002$).

Table 5. Cohen Mansfield Agitation Inventory by Type of Visit

Type of Interaction	N	M (SD)	t	p
Animal	44	34.0 (12.8)	.91	.365
Human	44	36.6 (13.4)		

4. DISCUSSION

With current goals in long-term care settings for improving the day-to-day quality of life of older adults with dementia, AAT is supported as one activity for improving social interaction. Both AAT and Human Interaction therapy created more positive interactions and engagement over no interaction at all. Engagement as well as behavior did demonstrate positive differences in animal therapy over human. A lower level of agitation was noted as well. Although these differences were not significant overall, a specific significant decrease in verbal aggression and an increase in demonstration of pleasure was seen in dog over human visits. This suggests that AAT therapy was successful in improving behavioral outcomes with dementia.

In this study AAT did outperform human interaction, though not drastically. Several limitations must be noted. The human interaction therapy was performed by a nurse experienced in working with those with dementia that may have increased the therapeutic value of this interaction over what is traditionally present in day-to-day human interaction. In addition, the presence of students as observers in both therapies may have contributed to the novelty of the human interaction over what is traditionally experienced. Overall, a standard interaction with individuals common to the environment may have served as a more appropriate control. Additionally, the CMAI should have been performed prior to either therapy to demonstrate if both therapies improved outcomes over usual care.

Animal assisted therapy programs have been found to increase social interaction and engagement in patients living with dementia.[9, 10] Participants in the current study had increased positive interactions and engagement in the presence of the animal. This is similar to a study in which nursing home residents exhibited positive attitudes and increased engagement duration in the presence of real dogs as well as robotic dogs, a puppy video, and a plush dog.[6]

The increase in positive interactions noted with both AAT and Human interaction therapy in this study is similar to findings in other studies. One study compared the effects of visitation by a person, a person accompanied by a live dog, and a person accompanied by a robotic pet.[19] All three types of visits stimulated positive social interactions in female nursing home residents with dementia. Conversation, touches and looks, and smiling and laughing were stimulated by all three visits with no significant differences among the three. Similarly, in an AAT intervention study that used plush dogs as a control activity, an increase in positive emotions such as pleasure and general alertness, as well as a reduction in sadness and anxiety in Alzheimer's patients at an adult

day center was observed.[3] The current study also noted a significant increase in demonstration of pleasure and lower anxiety levels though not to a level of significance.

Anecdotally, researchers noted several occasions when AAT seemed to benefit assisted-living patients in this facility. For example, one of the researchers was asked by a staff member to visit a patient who was not enrolled in the study, but was having a difficult day. The researcher agreed to visit the upset and crying resident. As the researcher and animal entered the room, the resident immediately stopped crying, smiled, and indicated she wanted to pet the dog. The dog was placed on the bed next to the resident and she began to stroke the dog. The tears of sadness turned to tears of obvious joy. The emotion in the room was palpable and all who witnessed the interaction said it was an amazing transformation. While anecdotal stories are criticized as evidence, they are motivating to researchers who see the difference animals can make in the lives of those suffering from dementia and other conditions.

5. CONCLUSION

The human-animal bond is difficult to define, even more difficult to describe, but easy to discern. Everyone that witnesses it knows what he or she has seen. The data support AAT practiced according to guidelines and ethical principles is an effective supportive treatment option for improvement of behavior and quality of life in persons with dementia.

CONFLICTS OF INTEREST DISCLOSURE
The authors declare that there is no conflict of interest.

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