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# Effects of animal-assisted therapy on agitated behaviors and social interactions of older adults with dementia

Nancy E. Richeson, PhD, CTRS

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## Abstract

*The effects of a therapeutic recreation intervention using animal-assisted therapy (AAT) on the agitated behaviors and social interactions of older adults with dementia were examined using the Cohen-Mansfield Agitation Inventory and the Animal-Assisted Therapy Flow Sheet. In a pilot study, 15 nursing home residents with dementia participated in a daily AAT intervention for three weeks. Results showed statistically significant decreases in agitated behaviors and a statistically significant increase in social interaction pretest to post-test.*

*Key words: animal-assisted therapy, therapeutic recreation, agitated behaviors, agitation, evidence-based practice, social interaction*

## Introduction

This pilot study tested the animal-assisted therapy (AAT) intervention developed for the 2003 *Dementia Practice Guidelines for Treating Disturbing Behaviors*.<sup>1</sup> The *Guidelines*, sponsored by the American Therapeutic Recreation Association, provides an approach to changing disruptive behaviors in dementia care settings<sup>1</sup> that is based on evidence from current research. Incorporating research into an evidence-based practice has a long history in the healthcare professions but has only recently become popular in therapeutic recreation. Therapeutic recreation specialists have traditionally made treatment decisions based on their educational background, client assessment, and client and family preferences. The evidence-based practice combines such traditional

methods with the best available evidence from scientific research in making treatment decisions.<sup>1-4</sup>

As dementia becomes more prevalent in our society, dementia-associated behavioral symptoms, such as agitation, will increase as well.<sup>1,5</sup> Agitated behaviors are one of the major patient management problems in nursing homes, affecting more than 90 percent of residents.<sup>6-8</sup> Thus, geriatric therapeutic recreation professionals need to investigate the efficacy of interventions for persons with dementia and agitated behaviors. However, many researchers believe that therapeutic recreation has not kept pace with other health professions in producing outcome-based research. A call for research in therapeutic recreation that demonstrates the importance of evidence-based interventions within the discipline is warranted.<sup>1,3,4,9,10</sup>

## Literature review

Few studies have reported the effects of a therapeutic recreation AAT intervention in a nursing home. In 2002, Richeson and McCullough reported the effects of such an intervention on the subjective well-being of older adults in a skilled nursing facility.<sup>11</sup> The authors studied 37 elderly residents in three nursing homes over a four-week period using an experimental pre/post-test research design with three randomized groups: Group A (AAT once a week), Group B (student visitors), and the control group (no AAT or student visitors). Two instruments were used: the Positive and Negative Affect Scale (PANAS) and the Satisfaction with Life Scale (SWLS). Analyzing the data using a one-way analysis of variance (ANOVA) showed a statistically significant increase in satisfaction with life for Group A compared to Group B and the control group. Two of the 10 items on the positive affect subscale—the feelings “interested” and

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“excited”—also showed a statistically significant increase for Group A compared to Group B and the control group. Raters using an AAT flow sheet also recorded increased social interactions for Group A. The findings suggest that the AAT had a positive effect on the participants when compared to student visitors and the control group.

Another recent study examined the therapeutic effects of a therapy dog for persons with Alzheimer’s disease living in a special care unit (SCU).<sup>12</sup> A within-participant, repeated-measures design was used to determine if the placement of a therapy dog in the SCU for four weeks had an impact on the problem behaviors of 22 participants during the day and evening nursing shifts. The results showed a decrease in behavioral disturbances during the day shift. However, no changes in behavior scores were noted during the evening shift. This result might be attributable to a variety of environmental factors and warrants further study.

## Theoretical foundation

This pilot study was guided theoretically by the Need-Driven Dementia-Compromised Behavior (NDB) model for understanding the behaviors of persons with dementia.<sup>13</sup> The NDB model assumes that disruptive behaviors in persons with dementia, rather than being symptoms of dementia, are based on unmet needs, and that effective interventions can be designed “by isolating proximal factors (physical and social environment) and manipulating them in a way to prevent, reduce, or eliminate the behaviors.”<sup>13</sup> Therapeutic recreation specialists can affect physical and social environment by implementing interventions, by providing either therapeutic recreation programs or as-needed (PRN) therapeutic recreation.<sup>1</sup> This pilot study used the first approach, providing an intervention at a specific time (change of nursing shift) to clients with a specific diagnosis (dementia) who demonstrate a disturbing behavior (agitation).<sup>1</sup>

Change of nursing shift was chosen because of the high incidence of sundowning—increased agitation experienced late in the day by older adults with dementia.<sup>14</sup> Researchers have documented increased incidence of agitation in the evening,<sup>15</sup> and have noted the need for behavioral and environmental interventions in place of long-term pharmacological treatment to reduce such disturbing behaviors.<sup>16</sup> Furthermore, researchers support the need for behavioral and environmental interventions to treat disturbing behaviors. Studies have shown a relationship between disturbing behaviors and institutionalization, unvarying routines, and boredom.<sup>17</sup> The American Alzheimer’s Association<sup>18</sup> suggests providing meaningful activities during these times, including activities that provide comfort, such as contact with animals.

## Method

### Design

The pilot study used a quasiexperimental time-series design with three phases: baseline (A) prior to intervention; post-test (B) after the three-week intervention; and follow-up (C) three weeks after the intervention ended. The participants served as their own control. The study tested four hypotheses:

1. The effects of the AAT intervention would decrease the agitated behaviors of the participants from baseline to post-test.
2. The agitated behaviors of the participants would increase from post-test to follow-up.
3. The effects of the AAT intervention would increase social interactions of the participants from baseline to post-test.
4. The AAT would decrease the need for PRN medications for the participants.

### Setting

The nine-week pilot study was conducted in two New England nursing homes which offered therapeutic recreation programs. The therapeutic recreation staff members consisted of certified therapeutic recreation specialists, therapeutic recreation specialists with certification pending, and therapeutic recreation student interns. The AAT intervention was conducted in a group room in SCUs certified for serving persons with dementia. The intervention took place Monday through Friday during the change in nursing shifts. Each intervention group in the pilot study consisted of the following participants: therapeutic recreation staff members, therapy dog(s), and the therapy dog handler(s).

Staffing patterns changed daily, depending on the needs of the residents and the availability of therapy dogs and handlers. Typically, there were two staff members from the therapeutic recreation department, one therapy dog, and one handler. However, on a few occasions, another therapeutic recreation staff member joined the group and an additional therapy dog and handler were present. (One handler moved to Florida at the last minute with two therapy dogs and one therapy dog died suddenly. So although AAT interventions ideally use certified therapy dogs, this pilot study included two therapy dogs in training.)

## Participants

The pilot study participants were nursing home residents selected by the therapeutic recreation director with assistance from the treatment team. Eligibility criteria were established by the researcher. Participants had to:

- reside in the nursing home in the SCU;
- be 60 years of age or older;
- have a Mini-Mental State Examination (MMSE) score of 15 or below;
- be diagnosed with dementia, as recorded by a physician in the resident's medical record;
- have at least three documented agitated behaviors (e.g., screaming, biting, and spitting) in the last two months as recorded in the resident's medical record;
- have a past interest in animals (e.g., owning a pet) as reported by family members;
- have no known allergies to dogs;
- have no known fear or intense dislike of dogs; and
- need an intervention for agitation, as identified by the therapeutic recreation director.

The participants' legal guardians signed an informed consent form approved by the University of Southern Maine Institutional Review Board. The form required that legal guardians be informed that their loved ones would be participating in a research study investigating the effects of AAT on the agitated behaviors of persons with dementia, and that participation was voluntary and they could withdraw from the study at any time. In a one-on-one meeting, a therapeutic recreation professional told each participant that they would receive a visit by a friendly dog and handler every weekday for three weeks.

Although blinding was not possible, bias was reduced by having the researcher's eligibility criteria applied by the therapeutic recreation director rather than by the researcher. After training by the researcher, the therapeutic recreation staff completed the Cohen-Mansfield Agitation Inventory (CMAI), AAT flow sheet, and record of PRN medication.

Initially, 17 residents who met the criteria for participation were selected as a purposive sample. One resident

refused to participate, and one participant died during the intervention phase; all data relating to these two were discarded. Sample size was limited due to the size of the dementia unit, staffing issues, availability of therapy dogs and handlers, and funding. Of the remaining 15 participants, 14 (93 percent) were female and all were Caucasian. Ages ranged from 63 to 99, with a mean age of 86.8 years. The mean score for the MMSE was 3.9, with a mode of 0 and a range of 0 to 15. Comorbidity data indicate that 26 percent of the participants had a secondary diagnosis of depression, arthritis, or hypertension, or all three (Table 1).

## Instruments

Prior to being selected for the pilot study, participants completed the MMSE. Convergent validity<sup>19</sup> and reliability<sup>20</sup> for the MMSE are well established. To qualify for the pilot study, the participants needed to have an MMSE score of 15 or lower (out of 30 possible points).

The therapeutic recreation professional completed the CMAI for each participant at baseline, immediately following the intervention, and three weeks after the intervention. The CMAI is a 29-item observational checklist that records agitated behaviors seen in older adults.<sup>6,8</sup> The behaviors provide the construct of agitation as classified in three syndromes: aggressive behaviors, physically nonaggressive behaviors, and verbally agitated behaviors.<sup>7</sup> The validity and reliability of the CMAI are well established; an average inter-rater reliability of .88 has been documented,<sup>20</sup> with a score as high as .92 reported.<sup>21</sup>

During the intervention phase, the therapeutic recreation professional completed the AAT flow sheet daily for each participant. The flow sheet is an evidence-based data collection tool used to determine if participants' social interactions increase after interactions with therapy dogs and their handlers.<sup>11</sup> The flow sheet rates nine items—looked at dog, touched dog, spoke to dog, remembered and used dog's name, engaged in activity with dog, reminisced about own dog, looked at dog handler, spoke to handler, and remembered handler's name—using a four-point Likert-type response format of 1 (never), 2 (one time), 3 (two to three times), and 4 (more than three times).<sup>11</sup> Inter-rater reliability has been reported to be as high as .98; internal consistency has been established with a Cronbach's alpha of .78.<sup>22</sup>

## Intervention

The pilot study tested a therapeutic recreation AAT intervention using a quasiexperimental time-series design. The AAT intervention was conducted for three

**Table 1. Comorbidities of participants (N = 15)**

Comorbidity	Number (percent)
Hypertension	4 (26)
Depression	4 (26)
Rheumatoid arthritis	2 (13)
Osteoarthritis	2 (13)
Chronic Obstructive Pulmonary Disease	2 (13)
Angina	1 (6)
Osteoporosis	1 (6)
Hypothyroidism	1 (6)
Macular degeneration	1 (6)
Hearing loss	1 (6)
Vision loss	1 (6)
Cerebrovascular disease	1 (6)
Glaucoma	1 (6)

weeks, Monday through Friday from 2:30 PM to 3:30 PM, during the change of nursing shifts. The intervention took place in a group room that was isolated from the commotion of the unit and used a structured, small-group approach in which a group of three to four participants, led by a therapeutic recreation professional, had contact with a therapy dog (or dogs) with a handler (or handlers).

For each session, the participants were seated in a circle. The therapeutic recreation professional began by introducing the members of the group to each other, to the dog(s), and to the handler(s). Participants could play with the dog, pet it, feed it treats, talk to it, brush it, reminisce about past pets, talk to the handler, and talk to the staff. Just before the end of the hour, the participants were thanked for attending and reminded of the next scheduled AAT session. The therapeutic recreation professional provided leadership by establishing rapport, encouraging appropriate communication, positioning the participants, and cueing the participants during each AAT session.<sup>1</sup> The handler(s) controlled the dog(s) at all times.

The therapeutic recreation professional or student intern collected daily data on each participant using the AAT flow sheet. Each morning, the therapeutic recreation professional recorded the PRN medications taken by participants the previous day.

## Analysis

The data were analyzed using SPSS for Windows Version 11.0. The independent variable was the AAT intervention. The dependent variables were the outcome measures agitation, social interaction, and PRN medication. The means and standard deviations of the outcome measures are presented below as descriptive statistics. A paired-samples t-test was used to test differences between the time series on the dependent variables, and to test the AAT flow sheet and analyze differences in the social interactions of the first and last weeks of the AAT intervention. A one-way ANOVA was used to determine if there were any differences between the participants' cognitive status, as measured by their MMSE scores, and the agitated behaviors observed. An alpha level of .05 was used for all statistical tests.

## Results

The data were checked for normality to see if the differences were significant between baseline (A) and post-test (B), and between post-test (B) and follow-up (C). Because the normality check produced p values of >.10, a paired-samples t-test was used in the analysis between time series A and B, and between B and C. The analysis revealed a statistically significant decrease in the mean scores between baseline (A), M = 65.93, SD = 15.40, and post-test (B), M = 50.53, SD = 9.41,  $t(15) = 5.732$ ,  $p = .001$ . The analysis also revealed a statistically significant increase between post-test (B), M = 50.53, SD = 9.41, and follow-up (C), M = 54.86, SD = 11.31,  $t(15) = -3.617$ ,  $p = .000$ .

A one-way ANOVA determined that there were no differences between the MMSE and the agitated behaviors of the participants recorded in the CMAI. The PRN medication record showed that 50 percent of the participants received Tylenol during the intervention phase and 33 percent received milk of magnesia, indicating that PRN medications were used sparingly. No differences in PRN medication were recorded from baseline to follow-up.

A paired-samples t-test was used to evaluate rating differences on the nine items of the AAT flow sheet between the first and last weeks of the intervention. The mean for the last week, M = 20.25, SD = 6.38, was significantly greater than the mean for the first week, M = 15.25, SD = 7.97,  $t(15) = -3.257$ ,  $p = .009$ .

## Discussion

Although the results of this pilot study are not generalizable due to the small sample size and lack of randomization, the findings are promising. The outcomes



indicate that a therapeutic recreation AAT intervention can decrease the agitated behaviors and increase the social interactions of persons with dementia. The CMAI and the AAT flow sheet revealed that the agitated behaviors of the participants decreased immediately following the intervention phase and increased during the follow-up phase of the pilot study. Social interactions increased significantly from the first week to the last week of the AAT intervention. A supposition could be made, based on the NDB theory, that the 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.

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 was extremely helpful in getting the participants ready for the group each day prior to the AAT intervention. They often engaged the participants in conversation regarding the dogs that were about to visit and, without prompting, reminisced with the participants about past pets. The nursing staff was also overheard sharing stories of their own pets with the participants. Occasionally, staff from other areas of the nursing home came by to meet the dogs and spontaneously engaged in conversation with the participants prior to the start of the AAT intervention. The intervention seemed to create an atmosphere of excitement and camaraderie for everyone involved.

Changes in the participants were also observed by their physicians, and after the follow-up phase at one nursing home, the therapeutic recreation professional began receiving "PRN therapeutic recreation" referrals for AAT to treat episodic dementia-compromised behaviors,<sup>1</sup> thus putting into practice the NDB model for persons with disturbing behaviors associated with dementia.

A crucial component of this pilot study was the participants' noted past interest in or ownership of animals. Many of the guardians said they wanted their loved ones to be part of the pilot study because of their history with animals. This reported premorbid interest in animals may have contributed to the positive outcomes. Recent research with older adults with dementia has highlighted the importance of matching activity with interest to sustain involvement in activities;<sup>23</sup> participants who are self-selected will receive the greatest benefit from an intervention. Having animals available for visits is a quality-of-life issue for residents of nursing homes, and residents who choose to participate in AAT will derive the greatest rewards.<sup>24</sup>

There were no differences in the participants' cognitive status, as measured by the MMSE scores, and the

agitated behaviors observed, suggesting that the AAT is an appropriate intervention for moderate to severe stages of dementia. Although the results did not show any decrease in the use of PRN medication during the AAT intervention, the therapeutic recreation staff reported that the nursing homes used PRN medication cautiously. A limitation of the pilot study is that the mood- and behavior-altering medications used on a daily basis were not reviewed, so it is not known if use of those medications remained stable.

Another key aspect of the pilot study was the involvement of recent therapeutic recreation graduates and student interns. In many universities, the therapeutic recreation curriculum has not kept pace with the changing needs of residents in long-term care facilities.<sup>1,4</sup> Participation in this pilot study provided recent undergraduates and student interns with hands-on experience in designing, implementing, and testing a therapeutic recreation intervention. Such experiences should help produce practitioners who incorporate evidence-based research in their practice when treating persons with dementia.

## Conclusions

Although the AAT intervention tested in this study decreased the agitated behaviors and increased the social interaction of the older adults with dementia who participated, further research is needed to determine how often and how long such an intervention should be conducted.

First, although changes in behaviors were demonstrated at the end of three weeks of a daily intervention, it would be useful to have more specific data, e.g., if the changes occurred prior to the end of the three weeks, or if a once-a-week intervention would have produced the same changes. Second, it is not known what is needed to maintain the level of functioning reached after the initial intervention phase. Third, the effects of mood- and behavior-altering medications have not been studied in the context of an AAT intervention. Fourth, an AAT program often relies on volunteers and their therapy dogs, and access to qualified volunteers could pose a problem for many therapeutic recreation programs trying to implement an AAT intervention. Investigating the availability of certification programs for therapy dogs across the country and determining ways for nursing homes to attract and retain qualified volunteers would be a worthwhile research project.

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