The effects of group and individual animal-assisted therapy on loneliness in residents of long-term care facilities

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Abstract

Animal-assisted therapy (AAT) has been shown to reduce the loneliness of residents in long-term care facilities (LTCFs). In this study, we determined the relative contribution of socialization (human–human bonding) and human–animal bonding as mechanisms by which AAT reduces loneliness. Residents in LTCFs volunteering for AAT were randomized to receive AAT as individuals (Individual) or in groups of two to four (Group). Individual AAT was used as a measure of animal–human bonding, and Group AAT was used as a measure of the combination of animal–human bonding and socialization. Any greater effect of Group AAT in comparison to Individual AAT would be ascribed to socialization. Thirty-seven residents of LTCFs, who were cognitively intact, volunteered for AAT, and scored as significantly lonely on the UCLA Loneliness Scale (Version 3), were studied. Six weeks of AAT, one 30-minute session per week, in an individual or group setting was performed, with posttesting during week five. Two residents dropped out of each group, giving us group sizes of 17 (Individual) and 16 (Group). A two-way ANOVA showed a statistically significant effect of pretest vs. posttest scores ($\underline{F}_{(1,31)}$ = 25.3, $\underline{p}$ < 0.001), with no effect of Group vs. Individual or of interaction. Newman Keuls post-hoc tests showed that the pretest scores for Individual and Group participants did not differ. There was a significant difference between pretest and posttest scores for Individual participants ($\underline{p}$ < 0.05) but not for Group participants. There was no difference between the posttest values for Individual vs. Group. When the data from all 33 participants were combined, Delta scores (pretest minus posttest), correlated positively ($\underline{p}$ < 0.01) with pretest scores, showing that lonelier individuals benefited more from AAT. In conclusion, AAT was more effective in improving loneliness in

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residents of LTCFs when given individually than in a group situation. Therefore, the main effect of AAT was not mediated by socialization.

L oneliness is a common phenomenon experienced by individuals living in long-term care facilities (LTCFs), and is related to multiple losses experienced by these individuals. These losses include friends and loved ones, such as a husband or a wife, and independence, resulting in an increased dependency on others to care for them. In addition, individuals who reside in LTCFs suffer from chronic conditions such as diabetes, cardiovascular diseases, stroke, decreased mobility related to Parkinson's disease, osteoarthritis, rheumatoid arthritis, and other physical disabilities which can limit social interactions with other residents (Butler 1995; Tijhuis et al.1999; McGilton 2002). Savishinsky (1985) and Arkow (1992) state that long-term care facilities tend to restrict a resident's options that relate to their quality of life. Three major restrictions relate to the loss of personal belongings, the loss of a personal possession (including that of pets), and the loss of opportunity for community-based social interactions. These restrictions can lead to depression, loneliness, and a greater social isolation. A decrease in social interactions, coupled with the loss of friends and significant others, may predispose many individuals in LTCFs to increased perceptions of loneliness.

Ebersole and Hess (1994) have written about loneliness and why it is a common occurrence in long-term care facilities. They attribute loneliness to the lack of contact with friends, being separated from others, and a lack of social activities. Hogstel (1995) has identified forced separation from others as the major reason for loneliness; the loneliest adults are those who have lost a spouse within the past five years. She states that the occurrence of loneliness in older adults in long-term care facilities is between 12 and 40 percent.

Calvert (1989) conducted a seminal study on loneliness and the use of AAT to decrease it. She studied people in two county homes, each with an existing resident pet program, and in two nursing homes with a visiting pet program. Sixty-five participants were recruited, and loneliness was measured by means of a simplified version of the revised University of California at Los Angeles (UCLA) Loneliness Scale. Residents who had a greater level of interaction with an animal experienced less loneliness than the residents who had less interaction with an animal. Calvert (1989) recommended that future research replicate this study with a larger sample and develop a reliable and valid tool to measure human–pet interactions.

It has been suggested, anecdotally, that pets can facilitate social interactions among humans. Using an experimental design study, Mugford and M'Comisky (1975) placed either budgerigars or begonias with a few old-age pensioners living alone in an urban area in Yorkshire, England. Half of the participants were randomly given a begonia and the other half were given a budgerigar. At the start of the study, the pensioners completed a 30-item questionnaire and this was administered again at the end of the study. The results of the final questionnaire showed that the birds had a positive effect on the pensioners. As a result, these people had more friends and visitors, and generally were more involved with the community than were the plant owners.

Messent (1983) investigated the role of pet dogs in facilitating social interactions among volunteers who were walking their dogs in Hyde Park, London. When the owners were with their dogs, social interactions were initiated by passersby on 22 percent of the walks, as compared to only two percent when the owners were not with their pets. The author concluded that pets function as social lubricants. McNicholas and Collis (2000) also examined the role of dogs as catalysts for socialization in a variety of settings. They found that passersby or strangers interacted with two different types of dog in various settings. The dog appeared to increase the number of interactions or encounters that passersby experienced.

Kongable, Buckwalter and Stolley (1989) examined the effects of a therapy dog on the social behaviors of twelve residents, ten men and two women, who were diagnosed with Alzheimer's disease. They found that the residents showed increased socialization or social activity when in the presence of the dog.

Fick (1993) examined the effect of the presence or absence of a dog on social interactions of nursing home residents. A convenience sample of 36 residents, primarily men, was recruited, and the study lasted for a total of four weeks, with each session occurring from 1:30 p.m. to 2:00 p.m. A method of point sampling was used to record the predetermined observable behaviors on a chart during specified time intervals. The results of this study demonstrated that verbal interactions increased when the dog was present.

The effect of animal-assisted therapy on older people, at home and in long-term care facilities, has been studied by a number of researchers. Raina et al. (1999) conducted a longitudinal study on independent-living older persons living in the community. After one year, pet-owning individuals had higher activity levels than those without pets. Crowley-Robinson, Fenwick and Blackshaw (1996) examined the effects of a resident dog, a visiting dog, and the visiting researcher (control) on tension, depression, anger, vigor, fatigue and confusion in older people living in nursing homes. The Profile of

Mood States (POMS) was used to assess these six factors. The resident-dog group showed significant decreases in depression, as did the control group. Significant increases in vigor were found in all three nursing homes, and there were significant decreases in fatigue, tension, and confusion in the visiting and resident-dog groups, compared to the control group.

Bernstein, Friedmann and Malaspina (2000) compared the effectiveness of AAT with non-animal therapy (NAT), as a way to stimulate social interaction and to initiate social behavior among people living in LTCFs. Thirty-three alert and semi-to non-alert residents were observed during AAT and NAT sessions. Social behaviors were divided into brief conversations, long conversations, and touch. During AAT, the residents were involved in more brief conversations with others, than residents in NAT. The authors also found that AAT played an important role in increasing the amount of touching that went on.

Animal-assisted therapy is one method that is currently being used to increase social interactions and to combat loneliness among older people. It is suggested that AAT can be viewed as a vehicle for social interactions (the pet as an "ice-breaker" in community-based social interactions). And while studies on AAT have been conducted by researchers from disciplines such as psychology, occupational therapy, anthropology, and veterinary medicine, to date, academic nursing has devoted limited effort to gathering information on the role of nurses in providing AAT. Currently, there is no nursing theory, and there is limited research on the benefits of animals to older people. Loneliness among older people in long-term care facilities is common, and is a problem that falls within the realm of nursing to diagnose and treat. It is also within the realm of nursing to determine if AAT has beneficial effects on loneliness in LTCFs. At present, there are many interventions (e.g., music therapy, humor therapy, reminiscence therapy) that are being used to decrease loneliness among older people in these places. Nurses have an obligation to know which of these are beneficial for older people.

The present study examined the phenomenon of loneliness and social interaction in a sample of older people residing in LTCFs. We hypothesized that the introduction of AAT would increase social interactions among residents in a group, and decrease loneliness, as measured by the UCLA Loneliness Scale (Version 3). Banks and Banks (2002) have previously shown that AAT was effective in decreasing loneliness in older people in LTCFs. This study used a quantitative method to test the effectiveness of AAT as an intervention, administered one-on-one to residents (without other residents present or the opportunity for other human–human interactions). We hypothesized that individuals who partic-

ipate in AAT in a group setting would experience a greater reduction in loneliness than individuals who receive AAT on a one-on-one basis, because of socialization in the group setting.

Methods

Recruitment and Participants

This research study was conducted in three LTCFs in the city of St. Louis, Missouri. The Human Studies Committee at Washington University School of Medicine in St. Louis and the administrators at the three LTCFs approved the study. Two of the LTCFs had semi-private or private rooms. One LTCF also had an assisted-living center (ALC) and some of the participants were recruited from there. This center consisted of private rooms, whereas the LTCF consisted mainly of semi-private rooms.

Using power analysis, we calculated that we would need at least thirty persons in the study to achieve statistical significance. Residents from three LTCFs were interviewed, screened and recruited, and we ended up with 37 participants in the sample. The exclusion criteria were known allergies to dogs and cats; a score lower than 24 on the Modified Mini-Mental Status Examination (MMSE); a score less than 30 on the University of California at Los Angeles (UCLA) Loneliness Scale (Version 3); and a known history of psychiatric disorders or Alzheimer's disease, as stated in the history and physical examination provided by the physician.

The ages of the participants ranged from 75 to 90 years, with a mean age of 80, and most were female (57%) and Caucasian (85%) (Table 1). Participants were randomly distributed into two groups: those who received AAT on a one-on-one basis (Individual, $n = 18$) and those who received AAT in a group setting of two to four residents (Group, $n = 19$). In both groups, the AAT was administered for 30 minutes once a week for six weeks. The residents were informed at the start of the study that they were allowed to withdraw from the study, and four residents, two from the Individual group, and two from the Group setting, chose to withdraw from the study during the second week of AAT. Therefore, a total of 33 residents ($n = 17$ for the Individual group and $n = 16$ for the Group setting) participated in the study.

Procedure

AAT sessions consisted of bringing a certified therapy dog into the LTCF. The dog received his certification from Support Dogs, Inc., a not-for-profit organization that is based in St. Louis, MO. The dog was temperament-tested and underwent twelve weeks of intensive training from this organization. Prior to enrollment at Support Dogs, Inc., the dog was exam-

Table 1. Demographics of study population

	Individual ($n = 17$)	Group ($n = 16$)
Age (years: Mean ± SD)	83.2 ± 5.4	81.1 ± 4.5
Age (Range)	69–90	69–87
MMSE (Mean ± SD)	28.8 ± 1.9	29.1 ± 1.4
MMSE (Range)	24–30	27–30
Gender		
Male (%)	9 (53)	5 (31)
Female (%)	8 (47)	11 (69)
Ethnicity		
White (%)	16 (94)	12 (75)
Black (%)	1 (6)	4 (25)
Institution		
LTCF (%)	16 (94)	10 (62)
ALC (%)	1 (6)	6 (38)
Education		
8–11th Grade (%)	12 (70)	10 (62)
High School (%)	3 (18)	5 (32)
College (%)	2 (12)	1 (6)

MMSE: Mini-Mental Status Exam; LTCF: long-term care facility; ALC: assisted-living center

ined by a veterinarian to ensure he was free from parasitic infections and was current on all the required vaccinations.

The principal investigator of our study accompanied the dog to all AAT sessions. In order to avoid any problems associated with socialization between the principal investigator and the resident receiving AAT, a script was read to each resident informing them of the need to avoid talking to the principal investigator during the AAT session. The dog always remained on a leash, and each resident was allowed to interact with—talk, to, groom, pat—whenever they wanted to. The same dog was used for the same resident for a total period of six weeks.

The Individual AAT sessions occurred in each resident's room. A brush was provided, and it was up to each participant to either brush the dog or not. The participant sat on a chair, while the dog sat on a chair facing him/her.

The Group AAT sessions occurred in the solarium in the LTCF. The participants sat in a semi-circle that consisted of two to four participants, while the dog sat on a chair that faced them. A brush was provided for the participants and they were allowed to brush the dog at their discretion. The participants were allowed to interact with each other or the dog, without any interference or input from the principal investigator.

Instruments

Two instruments were used in this study: the Modified Mini-Mental State Examination (MMSE; Folstein, Folstein and McHugh 1975) and the UCLA Loneliness Scale (Version 3) (Russell 1996). The MMSE was used to select participants during the screening phase of the study. It assesses mental function, orientation, memory, and attention; a score of 24 on the MMSE is an acceptable score to distinguish between individuals with cognitive impairments from those without any impairment (Folstein, Folstein and McHugh 1975; Folstein and Folstein 1995). Therefore, in our study, residents who scored 24 or better on the MMSE met our inclusion criterion.

The validity and reliability of the MMSE has been documented by Folstein, Folstein and McHugh (1975). The MMSE is reliable by 24-hour or 28-day retest by single or multiple examiners. When this instrument was administered twice, 24 hours apart by the same individual on both occasions, the Pearson coefficient was 0.887. When this instrument was administered 28 days apart, the Pearson coefficient was 0.98. Correlating the MMSE with the Wechsler Adult Intelligence, Verbal and Performance scores showed concurrent validity. For the MMSE versus Verbal Intelligence Quotient, the Pearson r was 0.776 ($p < 0.0001$). For the MMSE versus Performance Intelligence Quotient, the Pearson r was 0.660 ($p < 0.0001$). Folstein and Folstein (1995) state the MMSE is a valuable aid in assessing cognitive impairments.

The UCLA Loneliness Scale (Version 3) is a 20-item questionnaire that has high internal consistency, with a coefficient alpha of 0.89 to 0.94 (Russell 1996). Scores range from 20, meaning never lonely, to 80, a high degree of loneliness. In our study, residents had to score at least 30, which represent a moderate level of loneliness, to enter the study. This scale was administered to each resident after consenting to participate in the study but prior to the start of the AAT sessions (pretest score) and once again during week five, one week before the last session of AAT (posttest score).

Data Analysis

A two-way analysis of variance (ANOVA) with repeated measures was used to analyze the data with pretest vs. posttest scores and Group vs. Individual interventions being the two independent variables. Two-way ANOVA was followed by the Newman-Keuls test. The change in pretest and posttest scores (where the posttest score was subtracted from the pretest score) for the Group vs. Individual intervention was compared using Student's t-test. The relation between the change in scores (pretest minus posttest scores) and pretest scores was determined using regression analysis. The Statistical Package Prism 4.0 (Graph Pad, Inc., San Diego, CA) was used for the analyses.

Figure 1. Effect of AAT on loneliness. Pretest scores for Individual and Group did not differ. Posttest scores for Individual were significantly different ($p < 0.05$) from pretest scores. Posttest scores of those in Group did not improve with AAT, but were not different from posttest scores for Individual. Means are shown with their standard errors.
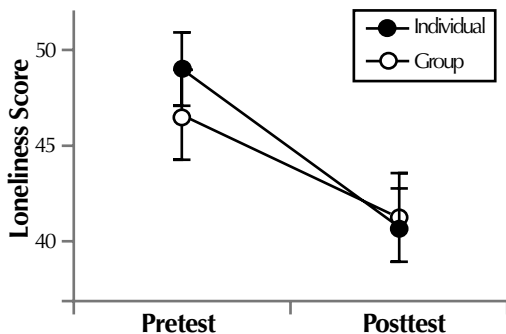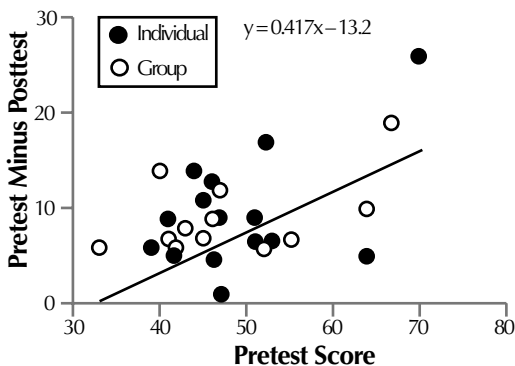

Figure 2. Correlation between delta (pretest minus posttest) scores and pretest scores. A higher value on pretest score indicates a more lonely individual, and a higher pretest-minus-posttest score indicates a bigger reduction in loneliness. The correlation was significant ($p < 0.01$), demonstrating that the biggest improvement occurred in the most lonely individuals.

Results

The two-way ANOVA with repeated measures showed a statistically significant effect of pretest vs. posttest scores ($F_{(1,31)} = 25.3, p < 0.001$), with no effect of Group vs. Individual and no interaction. Newman Keuls post-hoc tests showed that the pretest scores of those in the Individual group did not differ from the pretest scores of Group participants (Figure 1). Newman Keuls tests also showed there was a significant difference between pretest and posttest scores for the Individual intervention ($p < 0.05$), but not for the Group intervention. There was no difference between the posttest scores for the Individual vs. Group interventions. The change in scores (delta) gave mean values ($\pm SD$) of 8.12 ± 1.72 (Individual, $n = 17$) and 5.31 ± 2.05 (Group, $n = 16$). These values were not statistically different from one another.

There was a significant, positive correlation between the change in scores (pretest minus posttest) and the pretest scores when all values were used (Figure 2; y = 0.417x – 13.2, $r = 0.465$, $n = 33$, $p < 0.01$; $r^2 = 0.216$), and positive trends were detected when values from only Individual ($r = 0.443$, $p = 0.08$; $r^2 = 0.196$) or Group ($r = 0.458$, $p = 0.07$ $r^2 = 0.210$) were analyzed.

Discussion

The results of our study demonstrate that AAT can reduce the loneliness of residents, as measured by the UCLA Loneliness Scale (Version 3). Interestingly, the Individual setting of AAT achieved statistical significance, whereas the Group setting of AAT did not. As a result of this finding, the null hypothesis is rejected: the study did not support the hypothesis that AAT facilitates human–human interactions in the LTCFs. Another finding was that the lonelier an individual, the larger the improvement after incorporating AAT.

We hypothesized that AAT could be used in a group setting, believing that a dog could serve as a social motivator, thereby encouraging the participants to interact and become more involved with each other. It was an untested assumption that the major benefit of AAT is derived from the animal acting as a catalyst for human–human interactions. In fact, a previous study on AAT (Banks and Banks 2002) made great efforts to eliminate human–human interactions in order to determine the effectiveness of human–animal interactions in reducing loneliness. Here, we replicated the effect of human–animal interactions: loneliness decreased. However, the addition of human–human interactions did not help decrease loneliness; if anything, it tended to interfere with the effects of AAT.

There are three factors which may have prevented AAT from facilitating human–human interactions under the conditions of our study: hearing impairment, incompatibility and familiarity. Hearing impairment was prevalent in several of the participants placed in the group setting. They could not hear each other well, and commonly made repeated statements such as "Speak up as I cannot hear you well." This problem was also encountered in a much smaller study by Kongable, Buckwalter and Stolley (1989). They found that 42 percent of their participants had hearing impairments. Unfortunately, we can't make further comparisons with that study, as it was conducted on patients with Alzheimer's disease.

Incompatibility of participants occurred in our group setting. One individual, who was a college graduate, was randomly assigned to the group setting, which was made up of people who had less than an eighth-grade level of education. This college graduate said she could not contribute to the group dynamics, as she felt she had nothing in common with the other members. Another kind of incompatibility related to personality conflicts, in that some participants disliked each other.

Familiarity may also have been a factor affecting our results. Anecdotal evidence of animals facilitating human–human interactions has

usually been related in the context of initial or casual meetings between humans. In LTCFs, residents often see each other daily at meals and other activities. It may be that the social relationships we observed were already defined among the residents, and that there was little to that relationship that joint participation in AAT could add.

Overall, when we combined the results from both groups, we found a positive correlation between the change in scores (pretest minus posttest) and pre-test scores. That is, the larger the pretest score, indicating a more lonely person, the greater the change in the loneliness scores, after incorporating AAT. This result was not found, however, when we analyzed the two groups separately. Further research, utilizing larger sample sizes are needed to determine if the same positive correlation exist in Individual and/or Group settings.

The demographic profiles of the residents were very characteristic of LTCFs in the United States. The majority of the residents were widowed women who were between 70 and 85 years of age. This profile matches well with the 1996 United States Census, which found that older individuals between the ages of 76 and 90 account for more than 50 percent of all residents who reside in LTCFs. Most of these women had not finished high school: they had completed less than a ninth-grade level of education. There were no more than three residents who had a college education: two were men and one was a woman. A finding in this study that compares well with the results of the previous study by Banks and Banks (2002) is that the majority of residents who elected to participate in AAT had pets during their childhood and adult years. Therefore past experiences with pets is a predictor of who desires AAT and who does not.

Another confirmatory finding from this study is that all participants engaged in one form of reminiscence therapy in the presence of the dog: they talked very fondly and openly of their past and spoke very lovingly of their pets and the unconditional love their pets gave them. Jones (2003) found that reminiscence therapy improved the health and the quality of life of older residents in LTCFs who suffered from depression. However, that study did not examine the effects of reminiscence therapy on loneliness in residents living in LTCFs.

Previous studies confirm the importance of the social effects between older people and animals (Mugford and M'Comisky, 1975; Eddy, Hart and Boltz 1988; Rogers, Hart and Boltz 1993). However, two of these studies were not done in nursing home settings and were not randomized. In the non-randomized study of Fick (1993), increased verbal interactions were noted among nursing home residents, an interaction we did not formally

measure in our study. The study of McNicholas and Collis (2000) also provides evidence for increased socialization; however, this study was not done in a long-term care setting, and the ages of the passersby were not provided. Therefore, it is difficult to extrapolate the results of their study to older residents living in long-term care facilities.

Raina et al. (1999) gathered data by telephone interviews with older people at baseline and one year later. Their study differs from ours in that the primary focus of our study was to determine if loneliness and socialization decreased with the intervention of AAT. Their study's outcome focused on the participants' activities of daily living. Crowley-Robinson, Fenwick and Blackshaw's (1996) study used the POMS scale to assess changes in mood states: each question was read out to each participant. As they did not measure loneliness, it is difficult to compare the results of their study to ours. Bernstein, Friedmann, and Malaspina (2000) used an observational approach to measure social interaction among alert and semi- to non-alert older people. Once again, loneliness was not measured in this study.

Conclusion

Our study used a quantitative method to test the effectiveness of AAT as an intervention. Prior to this, a large number of reports on AAT were based only on anecdotal information. Our research differs from the studies cited in that it was randomized and conducted in three LTCFs. Only one previous study discussed the issue pertaining to hearing impairment, while participant incompatibility and familiarity were not discussed in any of the previous studies. We conclude that AAT is effective in reducing loneliness in LTCFs but that the primary benefit derives from human–animal interactions, not from facilitating human–human interactions.

The findings of our study have implications for nursing research. As loneliness can be diagnosed and treated by nurses, and as AAT has been shown to be effective in decreasing loneliness in LTCFs, it would be appropriate for nurses to test the role of AAT in decreasing depression among older people. Nurses also work in other institutions and play key roles in managing the care of patients in hospitals and in adult day-care programs. It would be beneficial for these nurses to test the role of AAT in lowering blood pressure and/or stress levels among older people in these kinds of facilities. Finally, as more nurses begin to work in community settings, it is probable that nurses may encounter individuals who are homeless. It would be interesting for nurses to study the therapeutic effects of AAT on this segment of the population.

Acknowledgement

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