

2019

An Animal-Assisted Intervention Study in the Nursing Home: Lessons Learned

Lonneke G. J. A. Schuurmans

Open University, The Netherlands, lonneke.schuurmans@ou.nl

Inge Noback

Open University, The Netherlands, inge.noback@ou.nl

Jos M. G. A. Schols

Maastricht University, The Netherlands, jos.schols@maastrichtuniversity.nl

See next page for additional authors

Follow this and additional works at: <https://docs.lib.purdue.edu/paij>



Part of the [Animal-Assisted Therapy Commons](#), [Animal Experimentation and Research Commons](#), [Design of Experiments and Sample Surveys Commons](#), [Geriatric Nursing Commons](#), [Geriatrics Commons](#), and the [Mental Disorders Commons](#)

Recommended Citation

Schuurmans, Lonneke G. J. A.; Noback, Inge; Schols, Jos M. G. A.; and Enders-Slegers, Marie-Jose (2019) "An Animal-Assisted Intervention Study in the Nursing Home: Lessons Learned," *People and Animals: The International Journal of Research and Practice*: Vol. 2 : Iss. 1, Article 7.

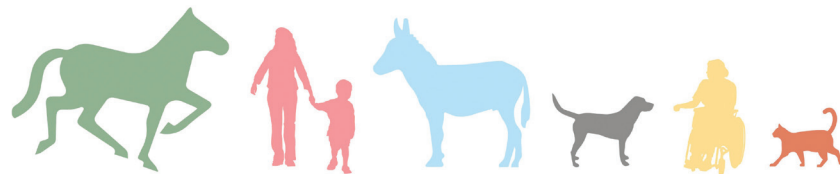
Available at: <https://docs.lib.purdue.edu/paij/vol2/iss1/7>

This document has been made available through Purdue e-Pubs, a service of the Purdue University Libraries. Please contact epubs@purdue.edu for additional information.

An Animal-Assisted Intervention Study in the Nursing Home: Lessons Learned

Authors

Lonneke G. J. A. Schuurmans, Inge Noback, Jos M. G. A. Schols, and Marie-Jose Enders-Slegers



People and Animals: The International Journal of Research and Practice

Volume 2 | Issue 1 | ISSN: 2575-9078

(2019)

An Animal-Assisted Intervention Study in the Nursing Home: Lessons Learned

*Lonneke G. J. A. Schuurmans,¹ Inge Noback,¹
Jos M. G. A. Schols,² and Marie-Jose Enders-Slegers¹*

Keywords: animal-assisted interventions, nursing home, dementia, research, animal welfare, ethics

Abstract AAI studies in the nursing home pose a specific set of challenges. In this article the practical and ethical issues encountered during a Dutch psychogeriatric nursing home AAI study are addressed with the aim of sharing our experiences for future researchers as well as AAI practitioners in general.

In our study we compared three groups of clients with dementia who participated in group sessions of either visiting dog teams, visiting FurReal Friend robot animals, or visiting students (control group) and monitored the effect on social interaction and neuropsychiatric symptoms through video analysis and questionnaires. We encountered the following four categories of challenges during our study.

Participant-related challenges include the legal implications of working with vulnerable patients, the practical implications of a progressive neurodegenerative disease with accompanying memory loss and behavioral problems, and the ethical implications of the use of robot animals for people with diminished cognitive functions.

A very important challenge involves the selection of the participating dogs and ensuring animal welfare during the study. We partnered with a local university of applied sciences to help us successfully address these issues.

The nursing home setting poses several practical challenges due to its inherent organizational structure, the high workload of nursing home staff, and an often suboptimal environment for a controlled randomized trial, especially when comparing nonpharmacological interventions. Balancing the desire for scientifically sound procedures with the practical limitations of a nursing home setting is often difficult and requires specific considerations.

(1) Open University, The Netherlands; (2) Maastricht University, The Netherlands

Methodological challenges are related to the core dilemma of how to measure and value small effects that might clinically be very relevant, but are often not scientifically significant. Video-analysis seems to be a useful method to help solve this dilemma, but is not without issues of its own, especially when considering the sensitive nature of video data and important privacy laws.

We feel that sharing our challenges and lessons learned, positive or negative, will ultimately help the field of animal-assisted interventions in the nursing home.

Introduction

Animal-assisted interventions (AAI) have gained momentum in the last two decades as a mean to increase quality of life of nursing home residents, especially for people suffering from dementia. A growing number of studies document (small) positive effects on outcomes like social interaction, neuropsychiatric symptoms, and depression (Kongable, Buckwalter, & Stolley, 1989; McCabe, Baun, Speich, & Agrawal, 2002; Nordgren & Engström, 2012; Richeson, 2003; Sellers, 2006). In recent years, more and more research has been conducted to support the—sometimes anecdotal—evidence through a scientific approach based on theoretical constructs (Baun & McCabe, 2003; Friedmann & Son, 2009; Marx et al., 2010; Verheggen, Enders-Slegers, & Eshuis, 2017; Wilson, 1994). Systematic reviews combine the best studies to further enhance our understanding of the effects of AAI in older people and dementia care in particular (Bernabei et al., 2013; Filan & Llewellyn-Jones, 2006; Hu, Zhang, Leng, Li, & Chen, 2018; Peluso et al., 2018; Perkins, Bartlett, Travers, & Rand, 2008; Yakimicki, Edwards, Richards, & Beck, 2019). From anecdotal case reports to systematic reviews, all efforts help propel the momentum forward by eliciting new questions and thus inviting us to conduct new intervention studies. Basically, this describes the scientific process at its best.

Unfortunately, the scientific process is not always easily applicable in the daily field of AAI and particularly AAI in the nursing home, working with people with dementia and animals in a highly regulated environment. Practical problems, safety and animal welfare concerns, staff workload, and the inclusion of people with impaired autonomy all pose multiple

challenges that need to be addressed, ideally before starting the study, but sometimes as you go along. Furthermore, many of these challenges are not limited to AAI research, but are equally relevant for all AAI practitioners in nursing homes.

This article aims to describe the main practical and ethical challenges in running a specific AAI intervention study in a nursing home and in doing so to share lessons learned for future researchers and practitioners in this field. The details of the study that provide the basis of this article are described in Box 1.

Challenges and Lessons

We divided the encountered challenges based on the PICO(TS) strategy of evidence-based practice (i.e., define the population, intervention, comparison, outcome, time horizon, and setting for each study, as described by Riva, Malik, Burnie, Endicott, & Busse, 2012), resulting in the four main categories discussed in this section.

Participants (Population)

Including people with dementia as study participants is both very rewarding and challenging. AAI sessions for people with dementia usually provide immediate positive feedback to the research and nursing staff involved with the sessions, especially when the residents respond to the activities (Crowley-Robinson & Blackshaw, 1998; Gundersen & Johannessen, 2018). Running an AAI study protocol in the nursing home is, for lack of a better word, “fun” and contrasts with the usual image of science

Box 1

Early in 2015, we conducted a 12-week trial in nursing home locations of De Zorgboog, a large care organization in the south of the Netherlands, with the aim of evaluating the effects of visiting dogs and visiting robots on social interaction and neuropsychiatric symptoms of people with dementia living in 24/7 care. During an 8-week intervention period, 66 clients (out of 183 eligible residents) participated in weekly sessions with either a dog (and handler), a robot (and handler), or a handler/student only (control group). Clients were assigned to one of the three groups through randomization. The study was registered at ISRCTN (reference number: ISRCTN93568533) and approved by the regional committee for medical research ethics (METC Zuyderland).

Only clients that lived 24/7 in the nursing home with a registered dementia diagnosis in their medical history could participate. Exclusion criteria included known dog allergies and a history of fear of dogs as well as extreme neuropsychiatric symptoms (e.g., aggression) that could potentially harm other participants or the dogs.

Participating dogs and their handlers were all certified AAI-teams and specifically selected on suitability for working in an unpredictable environment through a 2-day course and final examination, simulating client sessions. The robots used were FurReal Friend robot animals by Hasbro, specifically the model "Daisy," an interactive kitten.

All sessions were videotaped for further analysis through video-coding software with the focus on social interaction in the group and the presence or absence of neuropsychiatric symptoms during sessions. We also monitored dementia progress, quality of life, depression, and neuropsychiatric symptoms during the trial and 4-week follow-up through specific questionnaires, and we logged intercurrent illness and medication usage via the medical history.

as a "boring" discipline, a view that is predominant among the nursing home staff.

The inherent nature of dementia, on the other hand, also presents staff and researchers with several challenges. First of all, people with dementia are considered a vulnerable subject group and often lack the decisional capacity to give autonomous informed consent to participate in research, as is required by law (Kim, 2011). To include participants without decisional capacity in a research study, an informed consent by proxy is needed, usually by a family member or sometimes a representative appointed by law. Informed consent also requires that all proxies know exactly what they are consenting to and why. Dutch law provides the researcher with helpful, but also extensive, guidelines that need to be followed when involving vulnerable subjects in (medical) research (Rijksoverheid, 2014). This includes prior approval by the medical ethics committee. Getting approval involves a lot of paperwork. Getting informed consent by proxy also involves a lot of paperwork. An often heard complaint by proxies was why they needed to read so many papers just to have their mum or dad join a dog activity. Finding the right balance of not overcomplicating things and at the same time

complying with the letter of the law proved quite a challenge, and looking back we feel the (legal) complexity of it all has deterred some families from enrolling their loved ones in the study, thus limiting the number of participants. We most definitely do not propose to relax the guidelines—people with dementia are vulnerable and need to be protected—but we want to share our experience as a warning not to underestimate this aspect of enrolling participants. The comprehensive list of suggestions to help improve enrollment of people with dementia, as compiled by Cohen-Mansfield, Kerin, Pawlson, Lipson, and Holdridge (1988), is very helpful in this regard.

Another important aspect of informed consent is described by Kim (2011) as authenticity. This term is used to explain that a lack of decisional capacity does *not* mean a total inability to communicate a preference or exercise some level of decision-making. Even though people with dementia cannot give informed consent to enroll in the study as a whole, they can express a desire to join an activity or, equally so, an unwillingness to participate per session. Informed consent by proxy does not overrule the wishes of a person with dementia at any given moment. A client that clearly refuses (verbally or nonverbally) to

participate cannot be forced, even though staff or researchers (or AAI practitioners) know he or she will enjoy it later. Stimulating or even seducing people to join the activity via positive interaction is completely acceptable, but forcing them is not. During our study some clients refused to participate in a session, even with positive stimulation, meaning attendance varied on a session per session basis.

This highlights another challenge of working with people with dementia that might seem very obvious, but in fact can be very draining at times: people with dementia forget. For most people with severe dementia even repeated sessions are usually experienced as new, and initial invitations to join in are often met with confusion or even refusal that requires a lot of the motivational skills of the research assistant or staff. Similarly, group sessions are challenging because a certain amount of patience is required of the participants when taking turns in petting the dog or robot, and for some participants the presentation order (i.e., whether they were first or last in the group) significantly influenced their engagement. By varying the presentation order over the different sessions, we tried to correct for this possible confounder. We deliberately did not vary in the scheduling of the sessions: all took place in the afternoon at the same time slot (14.30–15.30 hours). We picked this time slot because in our experience people with dementia are usually very fatigued in the morning due to the exertion of various care activities. Afternoons, especially after the postlunch nap period, are often well suited for activities. Our findings are not unique. In a similar study, Kongable et al. (1989) highlight the difficulty of structured, alternate, group interventions due to the short attention span of people with dementia. Furthermore, research by the team of Cohen-Mansfield (2009; 2010a) has identified important variables that influence the engagement of people with dementia. These variables include dementia severity, presentation order, time of day, and setting. All these variables are involved when conducting AAI research, or indeed any AAI session in the nursing home, and need specific attention. By experiencing these challenges firsthand, this study has greatly increased our respect for nursing home

staff and recreational therapists: coaxing people with dementia to join and engage in your activity requires a very specific skill set!

Finally, the view of nursing staff, psychologists, and physicians who work with people with dementia on a daily basis is usually quite different from the public view. Specific aspects of dementia, especially the cognitive decline into a child-like or even vegetative state and the sometimes very severe neuropsychiatric symptoms, are considered emotionally confrontational or even inhuman (animal-like) in general society and politics (Innes, 2002). Examples of such symptoms include severe agitation or even aggression, repeated utterances of (animal-like) noises, loss of decorum (e.g., urinating in public), and sexual disinhibition. Educating dog handlers and research assistants (in our study psychology master students) in the various dementia symptoms and how to approach people with dementia is essential to help them successfully manage the sessions and overcome possible preconceptions or hesitations (Robinson & Cubit, 2007). Even so, differences in personality of handlers and students can influence the general atmosphere of a session and needs to be taken into account when analyzing results. These factors are not only important as possible confounders in AAI research, but also need special consideration for general AAI sessions in the nursing home. Any AAI practitioner working in dementia care needs to be educated (or coached) in approaching people with dementia.

Animals (and Robots) (Intervention)

When working with animals in a research study, one thing should be paramount: ensuring animal welfare (Glenk, 2017). Picking random dogs to participate in a dog visitation program is obviously not the right way to go. Instead researchers should enroll veterinarian-checked, certified AAI dogs or offer appropriate and robust AAI training to dog teams (dogs and handlers) who are interested in participating, including an “exam” to determine final suitability as an AAI dog team for the specific participants (e.g., people with dementia) that are involved in the research study (Mongillo et al., 2015). Organizing a

dog team training and selection program, whether for AAI research or any regular AAI program in the nursing home, should not be taken lightly. It requires careful planning, funds, and specific animal experts. Another important and obvious lesson is to have backup dogs and handlers. Dogs (and handlers for that matter) can be indisposed for various reasons, including the obvious one of female dogs being in heat. Having backup teams ready to substitute is necessary even though it might mean extra costs.

We have experienced during our study that it is vital that the research team includes independent, qualified animal behaviorists who know the species being used, and who are focused on the animal and nothing else. This concurs with the general consensus expressed in the IAHAIO guidelines on animal welfare in AAI (Jegatheesan et al., 2018). Physicians, psychologists, and nurses or recreational therapists are usually not trained to read stress signals in dogs and we wouldn't even think of pretending otherwise. Certified handlers should be able to read stress signals in their dogs and act accordingly, but might feel under pressure to perform that could influence their judgment. Having independent animal behavior researchers of the local Agricultural University for Applied Sciences monitoring our sessions each week (through video-analysis) and providing us with feedback on a session per session basis proved very helpful. For example, at one point one specific dog showed some signs of stress due to unintended pressure exerted by the handler out of a desire to perform well for the sake of the study. Due to the input of the behaviorist, we were able to act swiftly and successfully to improve the situation with the feedback provided by the behaviorists to the handler and the practical solution to not use a leash for this specific dog. Behaviorists may be researchers or practitioners, but they must be qualified and only use positive reinforcement methods (McBride & Montgomery, 2018).

To control for the effects of the handler, we deliberately chose to assign handlers to the robot animals. Dog handlers who were not involved in the dog condition because their dog was not suitable were "reused" as robot handlers. Other handlers in the robot condition were research assistants (psychology

master students). All robot handlers were instructed to work according to a protocol similar to the dog teams. Robot animals might seem like an uncomplicated alternative compared to living animals, but they can provide their own set of challenges. Bemelmans et al. (2013) have looked at important considerations for the development of robot interventions for intramural (institutional) psychogeriatric care. They stress the importance of a broader concept, including technical aspects, goals, target groups, environment, and staff perceptions.

An important technical consideration is to always make sure the desired robot is still in production at the time they are needed for the study. Unexpected production or delivery issues are not uncommon and can delay a project if not anticipated in a timely manner. Again, this illustrates that the trivial matters are the most unexpected and the most challenging at times. Another seemingly trivial technical lesson is to always make sure the robot is functioning without problems before each session and to have backup batteries available during each session.

Ethical considerations are also important when working with robot animals, both in a research setting as well as more generally when using robots in the nursing home: depending on dementia severity some people will believe the robot is a real animal and act accordingly. Providing a moment of happiness is very valuable in dementia care, even though it is provided through a robot, but nevertheless it can be hard, especially for family members, to be faced with the reality of the cognitive decline that leads to this confusion and could be construed as the team employing deception and encouraging infantilization (Diefeldt, 2014; Sharkey & Sharkey, 2012; Vanlaere, 2014). We deliberately chose not to mislead participants and always introduced the robot animal as a robot. Likewise, however, we did not correct people who despite this introduction firmly believed the robots were real. Instead, we validated their feelings at that moment, as described by Feil in her validation theory (2002). Family members and staff did not participate in sessions, but were sometimes able to observe sessions through a window. Staff members were all very enthusiastic about the robot and

the response of the clients. Family members were more ambivalent: most enjoyed the positive interaction displayed, but the emotional confrontation of a loved one “playing with a toy” was hard at times. One proxy decided to withdraw permission for participation of a client for that specific reason.

Upon completion of the study, all participating nursing home wards received a robot as a thank you gift. As can be imagined, this gift was highly appreciated by the nursing home staff.

Nursing Home (Setting and Time Horizon)

Theoretically, the highly structured and regulated nature of a nursing home should provide an optimal setting for scientific research. In practice, however, the nursing home is a challenging research environment due to a combination of staff-related and organization-related factors, including compliance (Maas, Kelley, Park, & Specht, 2002). A factor that was also relevant in our study was that nurses are not trained researchers and often require additional instruction and motivation to understand the importance of adhering to the intervention and data collection protocol. An ongoing interaction by members of the research team with the nursing staff is therefore highly recommended by Maas and her team. Furthermore, it is important for researchers to realize that the research protocol adds another burden to the already high workload of nurses, making it difficult to absorb. For some wards that participated in our study, it was challenging to provide the requested questionnaires in time, leading to missing values in the eventual data analysis. A pattern emerged in which the number of returned questionnaires was inversely proportional to two organizational factors: high nursing absentee rate due to illness (creating a high workload on that ward) and turnover of staff due to reorganizational measures (and thus compromising protocol adherence). Unfortunately, because of the somewhat unwieldy nature of a nursing home, it is not always possible to foresee these changing circumstances and have enough time to adjust. We tried to overcome these issues by assigning a research

assistant (usually a psychology master student) to each ward to help coordinate all the practicalities, answer questions, and provide positive feedback and support for the nursing staff.

On a session level the nursing home setting provides additional challenges. The basis of sound scientific research, and subsequently evidence-based medicine, is adhering to strict protocols to limit possible confounding factors that could influence the results (Rosenberg & Donald, 1995). Unfortunately, even the best protocols can go awry due to unforeseen circumstances. External disturbances, for example, can easily distract people with dementia. An unexpected music activity nearby can therefore be quite disturbing for the entire session. Knowledge of the activity schedule in the nursing home is essential to minimize these disturbances. *Do not disturb* or *do not enter* signs (and even a “door guard” if necessary) can also help prevent external disturbances. Other external factors that are quite prominent in the winter months are the flu and related viral illnesses. During our trial, the nursing home was hit by a flu epidemic, infecting not only participants but also research assistants! In retrospect, the winter months are not the ideal time of year for a nursing home experiment.

Another, less obvious, nursing home challenge involves the previously described required informed consent for the participation of people with dementia in research. A required informed consent for participants automatically excludes those residents that don't have an informed consent. Unfortunately, the residents themselves are usually not aware they don't have consent and might want to join in and play with the dogs or robots. In some locations of the nursing home, we struggled with keeping “unwanted” visitors out of the room that was designated for the interventions and sometimes had to make ad-hoc decisions to include a person for that particular session from an ethical standpoint because forced exclusion seemed inhumane and harmful for that particular person. Fortunately, this was a rare occurrence, but nevertheless something we did not anticipate. Choosing the location of the interventions wisely is the most important lesson we learned in this regard.

Finally, a totally unexpected issue was brought forward by the participants themselves. Some participants who were “unlucky” enough to be randomized in the control group (chatting with students without dogs or robots) expressed unwillingness to continue, because—to quote one of them—“*this is the most boring activity ever; I prefer to go and play bingo.*” Once this sentiment started to prevail in the group, more and more residents became unwilling to attend the control group sessions. This feeling was especially prevalent in the large nursing home location that provided lots of activities for residents in the weekly activity schedule (including bingo). A control group in which the handler engages the residents in conversations about animals in general and their own pets in particular, with the help of animal cards or photos and possibly a bingo-like setting might have been more suitable and more engaging for those residents. The “boring” sentiment was not universal, however. In the small-scale homelike locations the response was completely the opposite: residents are captured on video thanking the research assistants for the visits of the students and requesting other visits. This discrepancy is intriguing: residents in large-scale nursing homes seem to be accustomed to more specific activities, and to them chatting with students seems to be an inferior choice. Residents in the small-scale nursing homes usually live in a homelike environment and participate in household tasks without access to a variety of other (large-scale) activities. Chatting to students was apparently a sufficiently rewarding and novel experience for them, even without additional props. Other studies have looked extensively into the differences between large- and small-scale settings and found similar differences in activities (Boekhorst, 2010; Verbeek, 2011).

Methodology (Comparison and Outcome)

Methodological challenges are related to the inherent nature of AAI research in nursing homes: a true randomized controlled trial (RCT) is difficult in the nursing home due to randomization issues (for example, attrition of participants due to death or illness) and research protocol contamination (for

example, due to staff movement). As Maas et al. (2002) describe it, “a quasi-experimental rather than true experimental design is a compromise that may be necessary when nursing interventions are tested in nursing homes.” Participants and staff are usually not blind to the intervention. Completely controlling the environment and all confounding factors is often not possible (as illustrated in the previous section), enrolling clients can be disappointing, and statistical power issues can be the result. All these factors can detract from the true experimental RCT quality, hence the “quasi-experimental” designation. It is important to be aware of these limitations, but not be distracted by them, because a quasi-experiment is often the only option when researching AAI in the nursing home.

Video-analysis seems to be a useful method to enhance a quasi-experimental setting. Using a camera to capture an AAI session provides the researcher with valuable data that can be analyzed *ad infinitum* either qualitatively or quantitatively. The use of video data is not without issues of its own, especially when considering the sensitive nature of video data and important privacy laws.

Dutch law states specific requirements concerning the storage of medical data, including research data (Rijksoverheid, 2014). As part of the approval by the medical ethics committee, the researcher needs to provide information about where the data will be stored and when it will be destroyed. Video data is considered especially sensitive and has to be destroyed upon completion of the study.

As with all digital data, digital research data is also prone to unwanted deletion. The importance of having several backups cannot be underestimated, especially with video data. Due to privacy and safety concerns, video data cannot be stored in well-known cloud storage providers like Dropbox or OneDrive, but require an encrypted network share provided by the research institute or external hard drives in a secure environment. Setting up a safe backup and storage routine needs to be addressed before starting the experiment. The UK Data Archive has put together a comprehensive guide concerning data management, sharing, and storage that is also helpful for

researchers outside the United Kingdom (Van der Eynden, Corti, Woollard, Bishop, & Horton, 2011).

Discussion and Conclusion

Animal-assisted research studies, or indeed any AAI program, in nursing homes are not without pitfalls, especially when working with psychogeriatric clients. As described, the legal implications of including vulnerable patients in a research study should not be underestimated and require extensive preparation. These implications are not new. As early as 30 years ago Cohen-Mansfield et al. (1988) wrote about the (ethical) issues of obtaining informed consent for research in nursing homes and similarly concluded that a high consent rate requires intensive personalized follow-up and effort. The practical implications of specific dementia issues like neuropsychiatric symptoms and memory loss are even more challenging and include behavioral problems during sessions and motivational problems with an impact on session attendance. Maas et al. (2002) and Kongable et al. (1989) have reported similar methodological issues concerning (dementia) research in nursing homes, while the teams of Cohen-Mansfield (2009, 2010a, 2010b) and Marx (2010) have demonstrated the low stimulus-engagement level of people with dementia and the complex variables involved.

Animal welfare has gained steady traction as an equally important consideration when setting up an AAI study. As a consequence of this IAHAIO released an AAI white paper in 2014 with guidelines for the welfare of the animals involved (Jegatheesan et al., 2018). Animal welfare is in danger of being in the researcher's blind spot due to lack of expertise in animal behavior. A study by Ng and colleagues confirms this issue: AAI publications rarely report the descriptions of how the animal was used, nor the possible adverse outcomes for the animals, nor the training, certification, and veterinary and behavioral care of the animals involved (Ng, Morse, Albright, Viera, & Souza, 2018). Similarly, in previous research, we have found that Dutch nursing homes rarely have protocols concerning animal welfare

during AAI sessions (Schuurmans, Enders-Slegers, Verheggen, & Schols, 2016). Glenk (2017) has summarized the current body of evidence of animal welfare in AAI and in doing so illustrates all the important variables involved. Researchers are usually not sufficiently equipped to correctly handle all these variables. Collaborating with animal behavioral experts is, therefore, necessary to ensure animal welfare during an AAI study as well as an optimal fit between dog team and participant. As stressed previously, all these considerations are equally important for nonresearch AAI programs.

Using robot animals eliminates welfare issues, but brings up ethical considerations, especially when people with dementia can no longer identify the robot as a robot. Various authors have published on the delicate issues of elderly people with cognitive disabilities "playing" with robots, stuffed animals, or toys and the perceived infantilization of such activities (Diefeldt, 2014; Sharkey & Sharkey, 2012; Vanlaere, 2014). A common denominator in these articles seems to be that perceived infantilization is strongly associated with an inherent fear of dementia in general society. This can be addressed by stressing the importance of a substitute attachment figure in later stages of dementia and the importance of person-oriented use of robots (or dolls) based on previous preferences and life history. A baby doll, for example, will probably have more meaning for a woman who has had children than a woman without children.

This person-oriented use of robots with a clear explanation of the benefits (e.g., no allergies, no fear of dogs, no compromised animal welfare due to neuropsychiatric symptoms, required 24/7 availability) usually helps ease the possible apprehension of family members, especially when the intervention has specific, monitored goals (e.g., providing an attachment figure, stimulating interaction, providing relaxation) that are formulated in collaboration with the family or primary carers. Furthermore, a demonstration of the robot in which family members participate often results in more understanding and additional input for its use (Robinson, MacDonald, Kerse, & Broadbent, 2013).

Vanleare (2014) also stresses the importance of being honest: always present a robot animal as such (a battery-powered robot) and validate any subsequent feelings the robot provokes. Verheggen and colleagues (2017) have proposed an integrative approach toward understanding the therapeutic relationships between humans and animals, combining elements of important anthrozoological theories, including attachment theory, social support, and the biophilia hypothesis. The view of robot animals as substitute attachment figures implies robots can contribute to this approach as well.

From an evidence-based medicine perspective, the nursing home environment is a challenging environment, rife with possible confounding factors that require specific attention. A lot of decisions might seem trivial or obvious—choosing the designated session area, picking a time slot in the nursing home activity program, excluding nonparticipants—but can turn out to be very instrumental in the success or failure of an intervention session or an AAI program in general. Furthermore, specific methodological requirements for high-evidence results (i.e., blinding, large numbers, controlled environment) are usually not possible in AAI research (Maas et al., 2002).

By describing the challenges that we had to face during our experiments, we hope to help other researchers and practitioners when setting up their own AAI study or program in this field. We most definitely don't want to discourage anyone who has an interest in this type of research, because AAI studies in nursing homes also provide lots of opportunities to advance the field of AAI. Even though working with people with dementia requires a lot of patience and at times improvisational talent, it is also one of the most rewarding experiences a researcher can have. A dog that elicits a smile from a person with severe dementia, who is known to be unresponsive most of the time, is worth all the stress of doing research in this environment. Even when that specific smile was not captured on camera and will never be recorded in your SPSS database, the moment itself is invaluable. After all, clinical relevance is not always statistically significant.

Conflict of Interest

The authors declare no conflicts of interest. De Zorgboog, a nursing home and health care institution in the Netherlands, provided the funds to carry out the study referenced in this article. Ethics: The referenced study was registered at ISRCTN (reference number: ISRCTN93568533) and approved by the regional committee for medical research ethics (METC Zuyderland, reference number: NL50623.096.14). Animal Welfare: All participating dogs were veterinarian checked and certified by Pets4Care (<https://www.pets4care.nl>) according to the IAHAIO Guidelines. All dog teams (dogs and handlers) were specifically trained and selected for AAI in dementia care. Animal welfare was monitored in collaboration with researchers of the local Agricultural University for Applied Sciences in 's-Hertogenbosch.

References

- Baun, M. M., & McCabe, B. W. (2003). Companion animals and persons with dementia of the Alzheimer's type: Therapeutic possibilities. *Anthrozoös*, 47(1), 42–51. <https://doi.org/10.1177/0002764203255211>
- Bemelmans, R., Gelderblom, G. J., Spierts, N., Jonker, P., & De Witte, L. (2013). Development of robot interventions for intramural psychogeriatric care. *GeroPsych: The Journal of Gerontopsychology and Geriatric Psychiatry*, 26(2), 113–120. <https://doi.org/10.1024/1662-9647/a000087>
- Bernabei, V., De Ronchi, D., La Ferla, T., Moretti, F., Tonelli, L., Ferrari, B., . . . Atti, A. R. (2013). Animal-assisted interventions for elderly patients affected by dementia or psychiatric disorders: A review. *Journal of Psychiatric Research*, 47(6), 762–773. <https://doi.org/10.1016/j.jpsychires.2012.12.014>
- Boekhorst, S. te. (2010). *Group living homes for older people with dementia: Concepts and effects*. VU University Medical Center Amsterdam.
- Cohen-Mansfield, J., Kerin, P., Pawlson, G., Lipson, S., & Holdridge, K. (1988). Informed consent for research in a nursing home: Processes and issues. *The Gerontologist*, 28(3), 355–359.
- Cohen-Mansfield, J., Marx, M. S., Regier, N. G., & Dakheel-Ali, M. (2009). The impact of personal characteristics on engagement in nursing home residents

- with dementia. *International Journal of Geriatric Psychiatry*, 24(7), 755–763. <https://doi.org/10.1002/gps.2192>
- Cohen-Mansfield, J., Thein, K., Dakheel-Ali, M., & Marx, M. S. (2010a). Engaging nursing home residents with dementia in activities: The effects of modeling, presentation order, time of day and setting characteristics. *Aging and Mental Health*, 48(Suppl 2), 1–6. <https://doi.org/10.1080/13607860903586102>
- Cohen-Mansfield, J., Thein, K., Dakheel-Ali, M., & Marx, M. S. (2010b). The underlying meaning of stimuli: Impact on engagement of persons with dementia. *Psychiatry Research*, 177(1–2), 216–222. <https://doi.org/10.1016/j.psychres.2009.02.010>
- Crowley-Robinson, P., & Blackshaw, J. K. (1998). Nursing home staffs' empathy for a missing therapy dog, their attitudes to animal-assisted therapy programs and suitable dog breeds. *Anthrozoös*, 11(2), 101–104. <https://doi.org/10.2752/089279398787000779>
- Diesfeldt, H. (2014). De Schaamte Voorbij. *Denkbeeld* (April), 12–15.
- Feil, N. (2002). *The validation breakthrough: Simple techniques for communicating with people with Alzheimer's type dementia*. (2nd ed.). Baltimore, MD: Health Professions Press. <https://doi.org/10.4135/9781849208628>
- Filan, S. L., & Llewellyn-Jones, R. H. (2006). Animal-assisted therapy for dementia: A review of the literature. *International Psychogeriatrics*, 18(04), 597. <https://doi.org/10.1017/S1041610206003322>
- Friedmann, E., & Son, H. (2009). The human-companion animal bond: How humans benefit. *Veterinary Clinics of North America—Small Animal Practice*, 39(2), 293–326. <https://doi.org/10.1016/j.cvsm.2008.10.015>
- Glenk, L. (2017). Current perspectives on therapy dog welfare in animal-assisted interventions. *Animals*, 7(12), 7. <https://doi.org/10.3390/ani7020007>
- Gundersen, E. D., & Johannessen, B. (2018). What motivates arrangements of dog visits in nursing homes? Experiences by dog handlers and nurses. *Complementary Therapies in Clinical Practice*, 31, 104–110. <https://doi.org/10.1016/j.ctcp.2018.02.007>
- Hu, M., Zhang, P., Leng, M., Li, C., & Chen, L. (2018). Animal-assisted intervention for individuals with cognitive impairment: A meta-analysis of randomized controlled trials and quasi-randomized controlled trials. *Psychiatry Research*, 260, 418–427. <https://doi.org/10.1016/j.psychres.2017.12.016>
- Innes, A. (2002). The social and political context of formal dementia care provision. *Ageing and Society*, 22(04), 483–499. <https://doi.org/10.1017/S0144686X02008577>
- Jegatheesan, B., Beetz, A., Ormerod, E., Johnson, R., Fine, A., Yamazaki, K., . . . Choi, G. IAHAIO White Paper 2014 (updated for 2018). The IAHAIO definitions for animal assisted intervention and guidelines for wellness of animals involved in AAI. (2018). Retrieved from <http://iahaio.org/best-practice/white-paper-on-animal-assisted-interventions/>
- Kim, S. Y. H. (2011). The ethics of informed consent in Alzheimer disease research. *Nature Reviews Neurology*, 7(7), 410–414. <https://doi.org/10.1038/nrneuro.2011.76>
- Kongable, L. G., Buckwalter, K. C., & Stolley, J. M. (1989). The effects of pet therapy on the social behavior of institutionalized Alzheimer's clients. *Archives of Psychiatric Nursing*, 3(4), 191–198. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/2774672>
- Maas, M. L., Kelley, L. S., Park, M., & Specht, J. P. (2002). Issues in conducting research in nursing homes. *Western Journal of Nursing Research*, 24(4), 373–389. <https://doi.org/10.1177/01945902024004006>
- Marx, M. S., Cohen-Mansfield, J., Regier, N. G., Dakheel-Ali, M., Srihari, A., & Thein, K. (2010). The impact of different dog-related stimuli on engagement of persons with dementia. *Anthrozoös*, 25(1), 37–45. <https://doi.org/10.1177/1533317508326976>
- McBride, E. A., & Montgomery, D. J. (2018). Animal welfare: A contemporary understanding demands a contemporary approach to behavior and training. *People and Animals: The International Journal of Research and Practice*, 1(Article 4), 1–15. Retrieved from <http://docs.lib.purdue.edu/pajj/vol1/iss1/4>
- McCabe, B. W., Baun, M. M., Speich, D., & Agrawal, S. (2002). Resident dog in the Alzheimer's special care unit. *Western Journal of Nursing Research*, 24(6), 684–696. <https://doi.org/10.1177/01939450232055421>
- Mongillo, P., Pitteri, E., Adamelli, S., Bonichini, S., Farina, L., & Marinelli, L. (2015). Validation of a selection protocol of dogs involved in animal-assisted intervention. *Journal of Veterinary Behavior*, 10(2), 103–110. <https://doi.org/10.1016/j.jveb.2014.11.005>
- Ng, Z., Morse, L., Albright, J., Viera, A., & Souza, M. (2018). Describing the use of animals in animal-assisted intervention research. *Journal of Applied Animal Welfare Science*, 00 (October 8), 1–13. <https://doi.org/10.1080/10888705.2018.1524765>
- Nordgren, L., & Engström, G. (2012). Effects of animal-assisted therapy on behavioral and/or

- psychological symptoms in dementia: A case report. *Anthrozoös*, 27(8), 625–632. <https://doi.org/10.1177/1533317512464117>
- Peluso, S., De Rosa, A., De Lucia, N., Antenora, A., Illario, M., Esposito, M., & De Michele, G. (2018). Animal-assisted therapy in elderly patients: Evidence and controversies in dementia and psychiatric disorders and future perspectives in other neurological diseases. *Journal of Geriatric Psychiatry and Neurology*, 31(3), 149–157. <https://doi.org/10.1177/0891988718774634>
- Perkins, J., Bartlett, H., Travers, C., & Rand, J. (2008). Dog-assisted therapy for older people with dementia: A review. *Australasian Journal on Ageing*, 27(4), 177–182. <https://doi.org/10.1111/j.1741-6612.2008.00317.x>
- Richeson, N. E. (2003). Effects of animal-assisted therapy on agitated behaviors and social interactions of older adults with dementia. *Anthrozoös*, 18(6), 353–358. <https://doi.org/10.1177/153331750301800610>
- Rijksoverheid. (2014). Medisch-wetenschappelijk onderzoek. Dutch Ministry of Family, Health and Care. Retrieved from <https://www.rijksoverheid.nl/documenten/brochures/2014/09/01/medisch-wetenschappelijk-onderzoek-algemene-informatie-voor-de-proefpersoon>
- Riva, J. J., Malik, K. M. P., Burnie, S. J., Endicott, A. R., & Busse, J. W. (2012). What is your research question? An introduction to the PICOT format for clinicians. *Journal of the Canadian Chiropractic Association*, 56(3), 167–171. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/22997465>
- Robinson, A., & Cubit, K. (2007). Caring for older people with dementia in residential care: Nursing students' experiences. *Journal of Advanced Nursing*, 59(3), 255–263. <https://doi.org/10.1111/j.1365-2648.2007.4304.x>
- Robinson, H., MacDonald, B. A., Kerse, N., & Broadbent, E. (2013). Suitability of healthcare robots for a dementia unit and suggested improvements. *Journal of the American Medical Directors Association*, 14(1), 34–40. <https://doi.org/10.1016/j.jamda.2012.09.006>
- Rosenberg, W., & Donald, A. (1995). Evidence based medicine: An approach to clinical problem-solving. *BMJ*, 310(6987), 1122–1126. <https://doi.org/10.1136/bmj.310.6987.1122>
- Schuurmans, L., Enders-Slegers, M.-J., Verheggen, T., & Schols, J. (2016). Animal-assisted interventions in Dutch nursing homes: A survey. *Journal of the American Medical Directors Association*, 17(7), 647–653. <https://doi.org/10.1016/j.jamda.2016.03.015>
- Sellers, D. M. (2006). The evaluation of an animal assisted therapy intervention for elders with dementia in long-term care. *Anthrozoös*, 30(1), 61–77. https://doi.org/10.1300/J016v30n01_04
- Sharkey, A., & Sharkey, N. (2012). Granny and the robots: Ethical issues in robot care for the elderly. *Ethics and Information Technology*, 14(1), 27–40. <https://doi.org/10.1007/s10676-010-9234-6>
- Van der Eynden, V., Corti, L., Woollard, M., Bishop, L., & Horton, L. (2011). *Managing and sharing data*. Retrieved from <http://repository.essex.ac.uk/2156/1/managing-sharing.pdf>
- Vanlaere, L. (2014). Wat doen we met Paro? *Denkbeeld*, 9(2), 6–9.
- Verbeek, H. (2011). *Redesigning dementia care: An evaluation of small-scale, homelike care environments*. Maastricht University.
- Verheggen, T., Enders-Slegers, M.-J., & Eshuis, J. (2017). Enactive anthrozoology: Toward an integrative theoretical model for understanding the therapeutic relationships between humans and animals. *Human-Animal Interaction Bulletin*, 5(2), 13–35. Retrieved from <https://www.apa-hai.org/human-animal-interaction/haib/2017/volume-5-no-2/enactive-anthrozoology/>
- Wilson, C. C. (1994). A conceptual framework for human-animal interaction research: The challenge revisited. *Anthrozoös*, VII(1), 4–24. <https://doi.org/10.2752/089279394787002032>
- Yakimicki, M. L., Edwards, N. E., Richards, E., & Beck, A. M. (2019). Animal-assisted intervention and dementia: A systematic review. *Clinical Nursing Research*, 28(1), 9–29. <https://doi.org/10.1177/1054773818756987>