



Feature Article

Effect of animal-assisted activity on balance and quality of life in home-dwelling persons with dementia



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ABSTRACT

Purpose of the study was to examine if animal-assisted activity with a dog (AAA) in home-dwelling persons with dementia (PWDs) attending day-care centers would have an effect on factors related to risk of fall accidents, with balance (Berg balance scale) and quality of life (Quality of Life in Late-stage Dementia) as main outcome. The project was conducted as a prospective and cluster-randomized multicenter trial with a follow-up. 16 adapted day-care centers recruited respectively 42 (intervention group) and 38 (control group with treatment as usual) home-dwelling PWDs. The intervention consisted of 30 min sessions with AAA led by a qualified dog handler twice a week for 12 weeks in groups of 3–7 participants. The significant positive effect on balance indicates that AAA might work as a multifactorial intervention in dementia care and have useful clinical implication by affecting risk of fall.

Trial registrations: ClinicalTrials.gov; NCT02008630.

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Introduction

A World Health Organization (WHO) report on aging and health, published in 2015 (WHO^e), suggests there should be a shift in focus from diseases and morbidity to functional ability,¹ and therefore future studies of aging should be more specific when defining healthy aging and, in addition to describing patterns of morbidity and mortality, it is advisable to look at physical and cognitive function.^{1,2} Functional ability is the key for living good independent lives throughout the life course and obtaining a high quality of life (QoL).¹

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^e WHO – World Health Organization, PWDs – persons with dementia, QoL – quality of life, AAI – animal-assisted intervention, AAA – animal-assisted activity, MMSE – Mini-Mental State Examination, BBS – Berg Balance Scale, QUALID – Quality of Life in Late-stage Dementia, CDR – Clinical Dementia Rating (scale).

For many older people an independent life means living in their own place of residence. In Norway, about half of the total population of persons with dementia (PWDs) live in their own homes.³ People's ability to live at home as long as possible is a political goal in Norway and considered a human right.^{4,5} Part of reaching the political goal is the development of day-care centers for PWDs. Day-care centers have been described as offering respite care, with main aim to provide meaningful activities for home-dwelling PWDs.⁶

One type of activity that can be provided at day-care centers is animal-assisted interventions (AAIs), and these have become widely used among older people and especially dementia patients, as shown in several reviews.^{7–10} An AAI is defined as 'a goal oriented and structured intervention that intentionally includes or incorporates animals in health, education and human service for the purpose of therapeutic gains in humans'.¹¹ Animal-assisted activities (AAAs) are one type of AAI and include, for example, dogs and their handlers who visit for 'meet-and-greet' activities.¹¹ Most studies of AAIs have focused on the interventions' impacts on social outcomes,^{12–15} behavioral and psychological outcomes,^{16–20} and physiological outcomes,^{21–23} many of which are regarded as risk factors associated with falls. However, there are fewer studies of the effect of AAIs on performance-based physical outcomes and the results from these studies are inconsistent.^{19,24}

Balance is a central function in most activities of daily living²⁵ and is associated with QoL.²⁶ It has been shown that levels of physical activity decline with increasing age²⁷ and therefore in order to prevent falls it is important for people to maintain their physical performance as they age, particularly their strength and balance.²⁸ Complex interventions targeting several risk factors related to falls have been considered most effective for reducing the risk of falls and are therefore recommended.^{29,30} A model by Horak suggests that effective rehabilitation of balance requires an understanding of the many systems underlying postural control such as cognitive processing (attention and learning), biomechanical restraints (strength and limits of stability), sensory strategies, movement strategies, orientation in space, and control of dynamics.³¹

As stated by WHO, independent living and PWDs' QoL should be in focus. QoL has been a subject of great interest in assessments of the outcomes of medical and social interventions, and the need to improve PWDs' QoL is increasingly acknowledged.³² QoL is a multidimensional concept, which in older adults includes behavioral competence, the objective environment, psychological well-being, and perceived QoL.³³ QoL among elderly PWDs is often diminished³⁴ due to several factors such as low cognitive function, major depression, lack of social activities, impaired mobility, and low performance in activities of daily living.^{26,35–37} It is documented that older people consider good functioning to be of higher importance than the prevention of diseases,³⁸ and PWDs with higher physical capabilities, such as strength and balance, have scored higher on QoL.²⁶ Further, a study demonstrated that AAA had a positive effect on the QoL of PWDs living in nursing homes,²⁰ but it is not known whether the effect would be the same among home-dwelling PWDs.

Based on previous research on AAls and PWDs' need for meaningful activities,³⁹ research on the effect of AAls on the physical outcome 'balance' would be of great interest. Moreover, there has been a lack of research on the effect of AAls in home-dwelling PWDs in general.

The main aim of the study on which this article is based was therefore to examine whether, in the context of in home-dwelling PWDs attending day-care centers, AAAs would have an effect on factors related to the risk of fall accidents, with balance and QoL as main outcomes.

Material and methods

Design

The study was conducted as a prospective and cluster-randomized multicentre trial with a follow-up study. The project is registered in [ClinicalTrials.gov](https://clinicaltrials.gov), a service of the USA's National Institutes of Health (identifier: NCT02008630).

A total of 16 adapted day-care centers for home-dwelling PWDs in the Norwegian counties of Østfold, Vestfold, Oslo, and Akershus were recruited to the project. After recruitment, each day-care center was randomized, by computerized random numbers at Uni Helse in Bergen, to either animal-assisted activity with a dog (AAA) or to a control group with treatment as usual, which means they continued routine care in their respective settings.

The day-care centers included in the study all provided the facilities required to carry out the interventions. They also abstained from any activities involving dog visits for three months prior to the intervention, as well as during the whole intervention and follow-up.

After randomization, each day-care center was asked to recruit between 5 and 8 home-dwelling participants.

Data were collected at pre-test before the intervention started (T_0), when the intervention finished (T_1), and at follow-up three months after the end of the intervention (T_2).

Participants and recruitment

The recruited participants were at the age of 65 years or older and had either a diagnosis of dementia or a cognitive deficit measured as a score of less than 25 on the Mini-Mental State Examination (MMSE).^{40,41} Participants with a fear of dogs or with a dog allergy were not included.

A total of 80 participants were included in the study: 42 in the intervention group and 38 in the control group (Fig. 1). One of the participants in the intervention group withdrew and was therefore excluded from the analysis. The study was conducted during three periods: winter–spring 2013 ($n = 17$), autumn–winter 2013 ($n = 30$), and spring–summer 2014 ($n = 32$).

Procedure

The testers were health-care personnel working at the day-care centers. Prior to the start of the study they received mandatory lectures on how to use the Quality of Life in Late-stage Dementia (QUALID) questionnaire, and 2.5 h course in the theory relating to the Berg Balance Scale (BBS) and practical training in the use of the scale. The testers were encouraged to continue their training by putting it into practice in the day-care centers prior to the start of the study. In order to avoid bias, the BBS tests were always performed in the same room at each center.

Dogs and their handlers

Both dogs and their handlers were well educated regarding AAAs and were considered suited for such tasks. All dog handlers were females. Prior to the study, the dogs were subjected to a screening test that contained different elements intended to assess personality traits, such as boldness, aggressiveness, sociability, and exploration, in addition to assessing each dog's behavior when being handled and petted. The tests were conducted by dog trainers and ethologists at the Norwegian Centre of Anthrozoology. Both the dogs and their handlers then completed at least one course in AAls for visiting dogs. In addition, most handlers had either a bachelor degree or prior experiential learning within biology or social care.

Intervention and intervention content

The intervention consisted of 30-min sessions of AAAs in groups of 3–7 participants twice per week for 12 weeks. The AAAs sessions were led by a qualified dog handler. A protocol for conducting AAAs was followed to ensure consistency between the intervention sessions held in the day-care centers. The intervention had a relatively strict design and was standardized as far as possible, despite the fact that one of the study objectives was to see whether it was possible to measure effects when AAAs occurred in a realistic setting with a representative sample of participants and different dog teams.

Since the main aim of the study was to see whether interventions with a dog would have an impact on participants' balance, the protocol was designed with that in mind. For each session, the participants were randomly seated in a half-circle, and the dog handler moved around the group so that each participant was able to greet the dog and feed it treats. Next, the handler organized different activities such as petting the dog, brushing the dog, feeding the dog a treat, or throwing a toy for the dog to fetch. The dog was kept both off and on its leash during the session, but

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