

# Review Article

## Dog-assisted therapy for older people with dementia: A review

*Jacqueline Perkins*

Australasian Centre on Ageing, The University of Queensland, Brisbane, Queensland, and Centre for Companion Animal Health, School of Veterinary Science, The University of Queensland, Brisbane, Queensland, Australia

*Helen Bartlett and Catherine Travers*

Australasian Centre on Ageing, The University of Queensland, Brisbane, Queensland, Australia

*Jacqui Rand*

Centre for Companion Animal Health, School of Veterinary Science, The University of Queensland, Brisbane, Queensland, Australia

*This review summarises and critiques the published literature regarding dog therapy for older people with dementia living in residential aged care facilities. Nine studies were identified for inclusion and although the methodological variability of studies makes it difficult to draw firm conclusions, research suggests that dog therapy is beneficial for people with dementia. The most frequently reported findings were an increase in social behaviour and a decrease in agitated behaviour during dog contact. Improvement in social behaviour was found to be unrelated to the severity of dementia. Various improvements on measures of global function were also reported. No study adopted a randomised controlled trial design and a number of potentially important factors were not controlled for, including halo effects of animals on caregivers that may bias caregivers' responses when acting as proxies for their relatives or residents. The pre-morbid relationship with dogs may be an important variable influencing outcomes.*

**Key words:** *dementia, human-pet bonding, leisure activities, pets, residential facilities, therapeutics.*

### Introduction

Dementia is the greatest single contributor to burden of disease due to disability at older age in Australia, and in 2006 an estimated 190 000 Australians aged 65 years or older had dementia. The prevalence and incidence of dementia are predicted to increase over the next few decades and it is estimated that by 2031, the number of people with dementia in Australia will increase to 465 000. This will result in a substantial increase in the burden imposed by this disease in Australia together with a sizeable increase in demand for dementia care [1].

The care needs of people with dementia increase with progression of the disease and in Australia most people with advanced dementia live in residential aged care (RAC) facilities [1]. Very

frequently, behavioural and psychological symptoms (BPSD) such as wandering, agitation, aggression and noisiness accompany dementia [1]. Serious BPSD not only causes distress to the individual concerned and increases their risk of physical harm, but also negatively impacts upon the quality of life of carers and coresidents and leads to burnout in care staff [1–3]. As up to three-quarters of residents in RAC facilities have either possible or probable dementia [1], the management of symptoms is central to their care [4,5].

However, the range of activities suitable for people with dementia is limited due to the cognitive and communication impairments of dementia [6], and the efficacy of currently available treatments is also limited. Although a range of non-pharmacological approaches to treat BPSD have been trialled including music therapy, reminiscence therapy, aromatherapy, validation therapy, light therapy, multisensory stimulation and cognitive therapy, the effects are modest, at best [7–13]. To date, few randomised controlled trials (RCTs) of non-pharmacological interventions have been conducted and further research is needed to develop more effective treatments for dementia.

Animal-assisted therapy has demonstrated some promise in increasing pro-social behaviour and reducing BPSD in people with dementia [14]. It is relatively new, beginning in the 1950s when Boris Levinson used pets in his psychotherapy practice [15,16]. Early research in aged care facilities suggests that dog contact offers a range of benefits for older people including tactile comfort and companionship, as well as assisting social interaction. Dog contact appears to facilitate a positive mental attitude, and appears to reduce the negative impact of living in a RAC facility, generally. The non-verbal communications of dogs were reportedly more friendly, non-judgemental, and conducive to sociable behaviours than those of the best-intentioned staff members [16]. It has been suggested that animals communicate better than humans with people with dementia who may have impaired language skills, because animals rely more on body language [6,15,17,18].

Although most animal-assisted therapy involves the use of dogs [4], the use of dog-assisted therapy for people with dementia has not been systematically investigated despite the enthusiastic although uncritical reports of the apparent benefits of the intervention. Many questions also remain unanswered, for example: Is dog-assisted therapy or activity effective for people with dementia? If so, how effective is it and what evidence is there? Why is it effective and what is/are the underlying mechanism(s)? Is dog therapy best understood from a human-animal bond perspective, or does a psychosocial perspective provide a better explanation? Does the mode of providing dog contact make a difference to the outcome?

*Correspondence to: Dr Jacqueline Perkins, Centre for Companion Animal Health, School of Veterinary Science, University of Queensland. Email: j.perkins@uq.edu.au*

Broadly, two methods have been used to provide dog contact: dog-assisted activity and dog-assisted therapy [4,19]. Dog-assisted activity has been defined as unstructured, informal, without specific therapeutic goals or recording of outcomes, and conducted by someone without special skills or training and possibly using an uncertified animal. By contrast, dog-assisted therapy is described as structured, one-on-one or in small groups, conducted by suitably trained professionals with specifically certified animals, and requiring active participation with specific therapeutic goals and outcomes recorded [19].

In order to compile an evidence base to begin addressing some of these questions, we reviewed the research literature for studies that examined dog contact as therapy for older people with dementia. Although a review of the therapeutic effects of a range of animals for older people with dementia was published in 2006 [17], an updated review with a specific focus on dog therapy was considered warranted given the pressing need to identify and develop effective therapies for people with dementia. The focus was restricted to dog therapy as dogs are considered more suitable than some other animal species for visiting RAC facilities as they tolerate novel environments without apparent stress [20,21].

### Method

A literature search was conducted using the electronic databases: the Web of Science, PsycINFO, Ovid Medline, Cinahl, ADT, Web of Knowledge, Cochrane and PubMed for English language articles published between 1966 and 2007. Search terms included the following combinations of keywords: (animal-assisted therapy or human-animal bond or animal-assisted activity or pet therapy) and (dementia). Studies were included if the focus of the research was interactions or outcomes of contact between older people (over 60 years) with dementia and dogs. Papers presenting viewpoints, editorials, case studies, opinions or reviews were not included. The reference lists of included studies were hand-searched to identify additional studies.

### Results

Nine studies that met the inclusion criteria were found. No RCTs of dog-assisted therapy were identified and no studies meeting the inclusion criteria were published prior to 1989. All included studies were conducted in a residential aged care setting or adult day care centre. Details of the included studies are provided in Table 1.

Six studies were conducted in the USA, two in Japan and one in Australia with sample sizes that varied between four and 28 participants. All studies included participants with a diagnosis of Alzheimer's disease (AD) or dementia as documented in the resident's chart. The severity of dementia ranged from mild to severe, although severity was not reported in two studies [6,14]. One study independently verified the diagnosis of dementia [22] while another specified a Mini Mental State Examination (MMSE) score of 15 or less in addition to the dementia diagnosis [23]. Additional inclusion criteria, such as the presence of challenging behaviours and the existence of a prior positive relationship with animals, were used in several studies [18,23,24].

The interventions trialled and outcome measures used varied considerably across studies. Measures used included medication use, ward noise levels, measures of cognition, global function and behaviour. A range of benefits of dog-assisted therapy or activity were reported including improvements in social behaviour, agitation, apathy and other problematic behaviours. Of the five studies that examined pro-social behaviour, all reported significant increases in a range of social behaviours such as smiles, looks, verbalisations and touches during the intervention phase, as measured by direct observation [6,18,23–25]. Three of these studies additionally measured agitation reporting significant reductions [18,23,24]. A significant reduction in a range of global problem behaviours measured by proxy report on all six subscales of the Nursing Home Behaviour Problem Scale (NHBPS) was also reported in subjects following the introduction of a resident dog in one RAC facility [14]. The improvement in behaviour was apparent during the day shift, but not during the evening shift.

Several studies evaluated the effectiveness of dog contact using a range of physiological measures including blood pressure, diastolic blood pressure, heart rate, skin temperature and CgA (an antibody found in saliva thought to be an indicator of stress). Walsh [26] reported a significant decrease in the average heart rate (but not blood pressure) of participants in the treatment group from pre- to post-intervention. They also reported a significant reduction in ward noise levels in the treatment ward compared to the control ward due to a decrease in loud spontaneous vocalisations and aggressive verbal outbursts in the treated group. The effects, however, were short lived with levels reverting to baseline within 30 minutes of the dog and handler departing the ward. By comparison, another study that measured heart rate, blood pressure and skin temperature of patients during dog contact did not find a significant difference on any of these measures using a within-subjects design [25].

The majority of studies employed a test–retest design while two studies non-randomly allocated participants to experimental and control groups [5,26]. Of those, one allocated subjects to groups on the basis of liking animals ( $n = 7$ ) with others allocated to the control group ( $n = 20$ ) [5]. In Walsh's study six participants were matched with seven control subjects in a separate ward within the same facility [26].

Two studies employed dog-assisted therapy [18,23] with visiting dog/s used in a semistructured program, while seven used dog-assisted activity with the mode of dog contact being either resident or visitation. Two studies investigated the effects of resident dogs: McCabe introduced a resident dog for 4 weeks into a special care unit with 22 residents [14], while Kongable observed 12 residents during dog-assisted activity for 3 hours once per week for 2 weeks, after which the dog became resident [6].

### Discussion

The limited research that has been undertaken provides some evidence that dog contact is beneficial for older people with

**Table 1: Summary of studies of dog-assisted therapy/activity in older people with dementia**

First author and year	<i>n</i>	Setting	Country	Dog contact prior in facility	Participant criteria	Participant's age (mean, SD)	Resident or visiting dog	Measures used	Findings
Sellers 2005 [18]	4	Residential care	USA	Yes	Moderate to severe dementia (any), likes animals, agitated behaviour	88, 86, 95, 79	Visiting	<ul style="list-style-type: none"> <li>• MMSE ABMI [37,38]</li> <li>• Social Behaviour Observation Checklist (SBOC) [6]</li> </ul>	Incidence of observed agitated behaviour during AAT was reduced (ABMI); incidence of observed social behaviour during AAT increased (SBOC)
Motomura 2004 [22]	8	Residential care	Japan	NM	Female mild dementia 4 DAT 4 VaD	(84.8 ± 7)	Visiting	<ul style="list-style-type: none"> <li>• MMSE, Apathy and Irritability Scale [39]</li> <li>• GDS [40]</li> <li>• PSMS [41]</li> </ul>	Staff-assessed reduced global apathy in AAA group (apathy subscale)
Richeson 2003 [23]	15	SCU	USA	NM	Moderate to severe dementia (any) with agitated behaviour; prior pet ownership	63–69 (86.8)	Visiting	<ul style="list-style-type: none"> <li>• MMSE CMAI [37,38]</li> <li>• As required meds</li> <li>• Social behaviour (AAT flow sheet)</li> </ul>	Incidence of observed social behaviour during AAT increased (AAT flow sheet); staff-assessed global agitated behaviour decreased in AAT group (CMAI); improvements unrelated to severity of dementia (MMSE)
Kanamori 2001 [5]	27	Psychiatric hospital day care program	Japan	Yes (treatment group at home)	Moderate dementia; likes animals	(79.4)	VisitingDog/s and cat/s	<ul style="list-style-type: none"> <li>• MMSE N-ADL [42]</li> <li>• Behav-AD [43]</li> <li>• Salivary CgA [44]</li> </ul>	Family assessed global care giving burden reduced in AAA group (Behav-AD); non-significant reduction of CgA in AAA group
McCabe 2002 [14]	22	Special residential care	USA	Yes	Dementia AD or related	68–96 (83.7)	Resident	<ul style="list-style-type: none"> <li>• Medication use</li> <li>• NHBPS [45]</li> </ul>	Staff-assessed reduction in global problem behaviour (NHBPS on all six subscales) after AAA (intro resident dog) during daytime shift only
Churchill 1999 [24]	28	Psychiatric hospital SCU	USA	NM	Mild to moderate dementia (AD or related), agitated behaviour in evening, no negative dog experiences	(83.8 ± 6.8)	Visiting	<ul style="list-style-type: none"> <li>• BDRS [46]</li> <li>• ABMI</li> <li>• Meds</li> <li>• Social behaviour</li> </ul>	Increase in duration and frequency of social behaviour (Social behaviour) and decrease in agitated behaviour (ABMI) during AAA in early evening; improvements unrelated to level of dementia (BDRS)
Batson 1998 [25]	22	Special residential care	USA	NM	Severe dementia (probable AD); no negative dog contact or significant sensory impairments	62–96 (77.9)	Visiting	<ul style="list-style-type: none"> <li>• BDRS</li> <li>• Social behaviours</li> <li>• BP, HR, skin</li> <li>• Temperature</li> </ul>	Increase in duration and frequency of Social behaviour (Social behaviour) during AAA; improvements (except praise) unrelated to severity of dementia (BDRS)
Walsh 1995 [26]	13	Psycho-geriatric hospital SCU	Australia	NM	Severe dementia (any) and difficult to manage	Over 65	Visiting	<ul style="list-style-type: none"> <li>• LPRS [47]</li> <li>• BCABS [48]</li> <li>• DBP, HR, DbA</li> </ul>	Reduced HR and ambient ward noise levels (DbA) in AAA group
Kongable 1989 [6]	12	Veterans home SCU	USA	NM	Dementia (AD); prior pet owner	66–88	Visiting; resident	<ul style="list-style-type: none"> <li>• 8 Pro-social behaviours (smiles, leans, looks, laughs, touches, verbalisations, name-calling, others)</li> </ul>	Increase in incidence of Pro-social behaviour (Pro-social behaviour); equal improvements for both resident and visiting dog mode

AAA, animal-assisted activity program; AAT, animal-assisted therapy program [19]; ABMI, Agitated Behaviour Mapping Instrument; Behav-AD, Behaviour of patients with Alzheimer's disease; BDRS, Bourne Dementia Rating Scale; BCABS, Brighton Clinic Adaptive Behaviour Scale; BP, blood pressure; CMAI, Cohen–Mansfield Agitation Inventory; CgA, a salivary antibody; DAT, dementia of the Alzheimer's type; VaD, vascular dementia; DBP, diastolic blood pressure; DbA, decibels; GDS, Geriatric Depression Scale; HR, heart rate; LPRS, London Psycho-Geriatric Rating Scale; MMSE, Mini Mental State Examination; NHBPS, Nursing Home Behaviour Problem Rating Scale; NM, not mentioned; PSMS, Physical Self-Maintenance Scale; SCU, special care unit.

dementia, with an increase in pro-social behaviour and a decrease in agitated behaviour the most frequently reported finding. The results, however, are modest and appear to be short-lived. Variability between the studies in participant numbers, recruitment and allocation procedure makes it difficult to compare studies and draw firm conclusions on issues such as: which subjects might benefit the most from dog therapy; what is the optimal duration of the intervention; and the extent to which the effects of the intervention generalise beyond the intervention phase. While short-term benefits are important as palliative measures, before any intervention can be justifiably implemented, it is necessary to know whether the results justify the time, cost and effort required. This review highlights a number of key issues for consideration in planning dog-assisted therapy for future research.

### Type of program and dog details

One issue relates to the mode of providing dog contact and it is unclear from the published research whether dog contact provided on a permanent basis by a resident dog is more effective than that provided intermittently as in the case of a visiting dog. The one study that compared the effects of both modalities reported equally positive results for both interventions [6]. It is also difficult to draw conclusions regarding the optimal amount of dog visitation for older people with dementia as sessions differed in length, frequency and duration and were provided in different areas within facilities. Where visitation was used, interventions ranged from 3 hours of informal individual visitation twice per week over 12 weeks [26], to one individual 10-minute session in a common area with the subject wearing physiological monitoring equipment [25], to 1-hour 5 days per week in a structured small group in a common area over 3 weeks [23].

A second issue concerns the lack of evidence-based session plans and lack of detail in the reported studies regarding the therapy dog(s) used. Only Richeson and Sellers [18,23] reported the use of session plans although these were not evidence-based and dog details were incomplete. For all studies reviewed, important details about the dogs used were not reported although such detail is necessary for replication. These include the dog's sex, neutering status, age, breed/type, colour, background, training, certifications, temperament, health and behaviour record. Session plans should be specific and evidence-based for each species used in an aged care setting and consider the specific requirements of the dog(s) used. A protocol should address the welfare needs of each species that differ in terms of social, environmental, and physical dimensions [27] as well as the therapeutic or recreational goals of the individuals involved and the facility. It is unclear that the welfare needs of a resident dog can be satisfied [27]. The ability of a facility to support any animal-assisted therapy or activity in terms of suitable space and staffing levels also requires consideration.

### Individual and environmental factors

Of the nine studies reviewed, only two included a separate control group [5,26], but these two studies failed to control for

a number of potentially confounding variables. The use of behaviour-modifying medication, commonly used in the target population, was not reported, and it is not known whether the use of such medication was equivalent in the intervention and control groups. Anticholinesterase inhibitors and antidepressants might enhance responses to psychosocial interventions and hence psychotropic medications that are prescribed to influence behaviour and responses [28,29] need to be controlled for when evaluating intervention outcomes.

Although participants in the intervention and control groups were matched on a number of dimensions including sex, diagnosis and medication usage in Walsh's study, and participants in both groups were reportedly difficult to manage, it is not clear whether the two groups were equally matched on this variable. It also appears that participants were not matched with regard to cognitive status or physical comorbidities at baseline as this was not reported. Furthermore, groups were allocated across wards, hence participants were not subjected to the same background environmental influences [26]. While this is convenient for delivery of the therapy, results may be confounded by the real day-to-day differences between facilities including the presence of different staff and any secondary influence the introduction of pets may have on staff.

Another potential confound may be the pre-existing level of activity or recreational programming within a facility at the time dog therapy is introduced. Facilities differ in terms of the type and degree of diversionary activity offered and this factor may influence outcomes although this variable was not reported nor controlled for in any of the reviewed studies. There may be an optimal level of activity for people with dementia and the introduction of dog therapy into a facility that offers a rich recreational therapy program may make little measurable difference to the quality of life and well-being of residents. Alternatively, the introduction of dog therapy in a setting that offers few activities may have a larger impact. Without such information, it is difficult to conclude to what extent dog therapy is effective and it may be that the introduction of any novel activity may have achieved a comparable result.

An additional confound is the presence of a therapist or human handler that accompanied the dog during visitation. This raises the possibility that the reported results may be due to increased attention of another person and not the dog per se. This can only be adequately tested by conducting a rigorously designed RCT where the therapist alone acts as the control condition. Finally, attendance at sessions was not reported by any study that provided multiple sessions of dog contact. Thus, it is not known how much dog contact participants actually received.

### Impact of residents' prior relationship with dogs

Six reviewed studies used previous relationships with animals to recruit or allocate subjects to groups, yet details of the method and questions were not reported or validated by any study [5,14,18,23–25]. The allocation of participants to an experimental group on the basis of liking dogs while allocating

participants to a control group if they disliked or feared dogs, perhaps due to trauma, clearly introduces a source of bias. Hence, this is an important variable to control for and the best way to do this may be to include people who like dogs in both experimental and control groups.

People with previous strong positive relationships with dogs may have an experience best understood in terms of a human–animal bonding theory such as attachment, social support or role theory [4]. They might benefit specifically from regular dog contact delivered in a therapeutic manner (as opposed to activity) in a small group setting over a longer timeframe to allow time for attachment to develop, and in a more structured manner to encourage participation in the small group process. Human–animal bond theory may assist in understanding the mechanisms underlying dog-assisted therapy/activity, outcomes, construction of suitable session plans, a protocol for each species with emphasis on animal welfare, and participant selection.

### Measurement issues

The majority of accepted and validated psychometric instruments in use for people with dementia are completed by proxy, whereby caregivers or relatives provide information or answer questions about or on behalf of the person with dementia [30]. Third party reporting adds another layer of interpretation, and questionnaires and instruments that rely on this method in the context of animal-assisted therapy may be subject to positive bias of at least two kinds. The first may be improved morale and positive effects of pets on staff and caregivers [2,24,26,31], while the second may be improved perceptions about people (the participants) in the company of pets [21,32]. Of the nine studies reviewed, only one used self-report outcome measures [22] and no study was designed to deal with the potentially confounding effects of pet exposure on caregivers. Hence, effects on staff and caregivers are of particular concern when proxy reports are used to evaluate the effects of animal contact.

The limited use of self-report outcome measures in the reviewed studies may be due to a lack of such instruments for use with people who have dementia. This review identified no self-report instruments designed to measure outcomes of animal contact, despite evidence that people with mild to moderate levels of dementia are reliably capable of completing some self-report instruments, and clearly able to express preferences [30,33–36]. The study by Motomura [22] was the only study to use self-report instruments (Geriatric Depression Scale (GDS) and Physical Self-Maintenance Scale (PSMS)), though these are general instruments and not designed specifically to measure outcomes of animal contact. The study failed to find any significant outcomes or trends on the GDS or PSMS, though the sample size may have been too small ( $N = 8$ ) to detect an effect. The belief that self-report psychometric instruments are not appropriate may have limited the development of these measures for this population.

### Conclusion

Dog therapy shows some promise for managing BPSD in people with dementia of various stages. However, a well-

constructed RCT of dog-assisted therapy and activity is required to address the question of whether dog-assisted therapy or activity is effective for people with dementia, and if it is effective, to what degree and why. This question has not yet been adequately answered due to methodological shortcomings of previous studies that include the specific biases of pet contact together with the use of proxy report for measuring outcomes, and the lack of implementation of a standardised protocol for dog-assisted therapy and activity across studies. Further development of specific psychometric instruments is needed for use with people with dementia to measure the effects of dog contact, inform outcomes and to better understand the theoretical basis for dog-assisted therapy and activity.

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### Key Points

- The methodological variability of the studies makes it difficult to draw firm conclusions about the efficacy of dog contact.
- Research suggests that dog contact ameliorates BPSD in people with dementia, and this is unrelated to disease progression.
- Potential confounding variables to be controlled for in designing future research include: effects of human contact from the dog handler, halo effects of dogs together with proxy report instruments, and prior relationships with animals.

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