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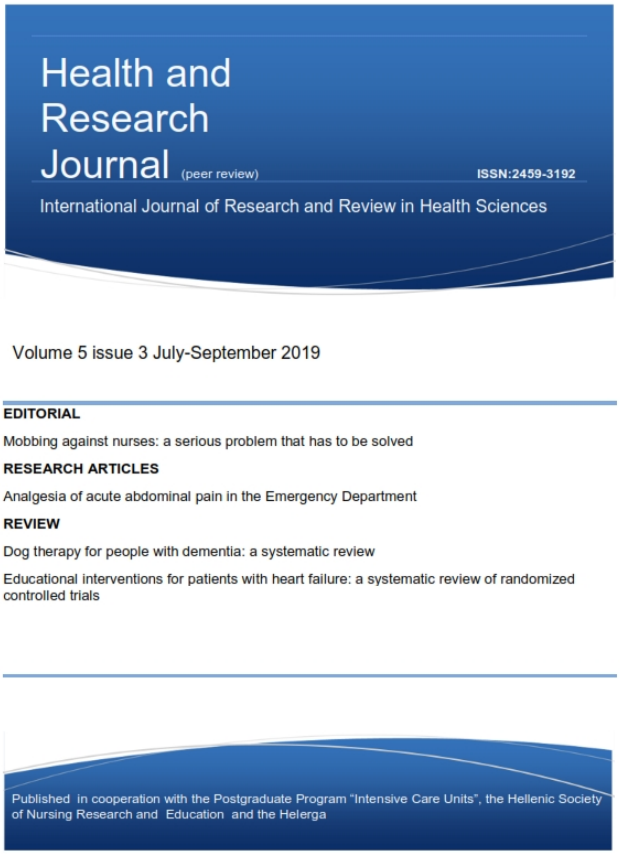

Dog therapy for people with dementia: a systematic review

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SYSTEMATIC REVIEW

DOG THERAPY FOR PEOPLE WITH DEMENTIA: A SYSTEMATIC REVIEW

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Abstract

Background: Dogs in particular have been singled out as a non-pharmacological means to help those with Alzheimer's Disease (AD). Hence, Dog Assisted Therapy (DAT) has emerged as a direct intervention where a dog that meets specific criteria for treatment purposes may assist and benefit a person with AD.
Aim: to synthesize research on DAT for AD, in order to investigate if this therapy has a positive influence on people with this disease.
Methods: A systematic literature search on Medline, Scopus, Google scholar, Cochrane Library and CINAHL was conducted. The search was carried out in November-December 2018 for papers meeting the following inclusion criteria: articles published in English and Spanish, research articles and not reviews, within the last 30 years (1989-2019) that were available in their entirety, rather than just an abstract.
Results: Twenty two studies were examined and all showed a favorable effect on patient status following DAT i.e. positive impact on patient outcomes due to while none reporting a negative effect. Yet, the studies did vary in terms of the intervention, i.e. in some, a small dog was used to improve patient outcomes, while others used a real dog, compared to a robotic dog or a video.
Discussion:DAT programs are becoming increasingly popular as supplementary to drug therapies. They were found to increase positive social behaviors, increased interaction and engagement amongst those with dementia resulting in fewer incidents requiring staff intervention. Also, conversation, touches, looks, smiling and laughing was stimulated by dog visits. All these positive effects were attributed to the presence of the animal which patients were encouraged to pet, touch and talk to the dogs. Furthermore, most authors acknowledge that DAT benefits blood pressure management and increases neuro-chemicals associated with relaxation and bonding. Hence, these benefits may influence behavioral and psychological symptoms of dementia by reducing aggression, agitation and anti-social behaviour.
Conclusions: People with dementia show a more cheerful mood with DAT and show significant increase in a variety of positive social behaviors such as smiles, looks, tactile gestures and verbalizations, i.e. DAT enhances pro-social behaviour. Furthermore, DAT is suggested to have a beneficial impact on physiological parameters as well, such as blood pressure management, heart rate and skin temperature. Yet, the psychological state of the patients is also noteworthy as DAT minimizes agitation, anxiety, apathy and aggression.

Keywords: Alzheimer's disease, animal therapy, dogs, and Dog Assisted Therapy.

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INTRODUCTION

The World Health Organization defines Alzheimer's disease (AD) as a neurodegenerative condition largely of unknown etiology, characterised by progressive memory and cognitive impairment which accounts for 50% to 75% of all cases of dementia. Multiple risk factors have been identified, including female gender, low education level, smoking, obesity and diabetes mellitus and advanced age.[1]

In 2006, a total of 26.6 million patients had AD globally. The incidence of Alzheimer's disease in Europe is 11.08 (95% CI, 10.30-11.89) per 1000 person-years.[2]Currently, the number of people with dementia globally is estimated to be 50 million and as a reference figure, this is greater than the total population of Spain and is projected to nearly triple by 2050. An increase of 87% of AD cases in Europe for 2050 period is also projected with forecasts suggesting that the global AD patient population will reach 106.8 million by 2050, with 16.5 million patients in Europe alone.

In recent years there has been increasing interest in the different ways in which animals can help patients. Dogs in particular have been singled out as an additional but non-pharmacological means to help those with Alzheimer's disease. Hence, the therapeutic aspect of Dog Assisted Therapy (DAT) has emerged which is a direct intervention where a dog that meets specific criteria for treatment purposes may assist and benefit a person with AD.[3]

DAT intends to provide physical, social, emotional and cognitive benefits in different environments, to individuals or in patient groups. The characteristics of the dog must adapt to the problem to be treated. i.e. the specific condition, and be trained to work in challenging environments and behave appropriately in the face of unpredictable reactions. The elderly may develop negative states that are precipitated by: isolation that can lead to loneliness, physical and mental debilitation, disorientation, experiential regression to past, passivity and a tendency not to stimulate one's mind or strive to a fulfilling personal capacity. To all this can be added cognitive upheavals, anxiety, panic, sexual upheavals and sleep disturbances among others.[2]

AIM

This review aims to analyze and synthesize research that relates to DAT for AD, in order to investigate if this kind of therapeutic intervention with the use of dogs has a positive influence on people with this disease.

MATERIAL AND METHODS

We conducted a literature search on Medline, Scopus, Google scholar, Cochrane Library and CINAHL using the keywords Alzheimer, Alzheimer's disease, AD, combined with animal therapy dogs, and Dog Assisted Therapy. As this was a narrative-discussion paper and not a meta-analysis, Bayesian random effects model was not used neither any tests for assessing heterogeneity as the studies found were very diverse in terms of sample and intervention applied.

The search was carried out in November-December 2018 for papers meeting the following inclusion criteria: articles published in English and Spanish, research articles and not reviews, within the last 30 years (1989-2019) that were available in their entirety, rather than just an abstract.

From the initial literature search, 108 references were yielded as being initially relevant to the key word search. After close perusal, 87 references were excluded due to double entries, no access to full text, mentioning a combination of DAT with pharmacological treatments for Alzheimer's studies on the effect of DAT on loneliness and not Alzheimer's or other (non dog) animal therapy. Therefore, only twenty-one studies met the inclusion criteria for analysis, (Figure 1).

RESULTS

The results of the present systematic review are presented in Table 1. Twenty-onestudies were examined and all showed a favorable effect on patient status following DAT i.e. positive impact on patient outcomes due to DAT while none reporting a negative effect. Yet, the studies did vary in terms of the intervention, i.e. in some, a small dog was used to improve patient outcomes, while others used a real dog, compared to a robotic dog or a video.

Elevenstudies were conducted in Europe, seven in USA, two Japan, and one in Australia. Therefore, it is evident that Europe

dominates research in this field, with most papers coming from Sweden (four).The samples used in the studies ranged from 1-65, (mean=30) i.e. case studies to larger one. From a chronological point of view, it can be seen that within the last three decades, there was relatively limited interest in this area in the '90s up to the first decade of the new century, but a burst of interest was expressed in the last decade with several publications mainly from Europe.

DISCUSSION

DAT programs were found to increase positive social behaviors, increased interaction and engagement amongst those with dementia resulting in fewer incidents requiring staff intervention. Also, conversation, touches, looks, smiling and laughing was stimulated by dog visits. All these positive effects were attributed to the presence of the animal which patients were encouraged to pet,touch and talk to the dogs. These results are similar to studies where a robotic dog was used. Similarly, these types of visits stimulated positive social interactions in nursing home residents with dementia.

Overall, DAT is becoming increasingly popular as supplementary to drug therapies for Alzheimer's, mostly in residential care for the elderly. Most authors acknowledge that DAT benefits blood pressure management and increases neuro-chemicals associated with relaxation and bonding. Hence, these benefits may influence behavioral and psychological symptoms of dementia by reducing aggression, agitation and anti-social behaviour.[24]

A decade ago, a critical review by Perkins et al.,[25] found nine studies suggesting that DAT is beneficial for dementia sufferers. Yet, the authors caution that due to methodological variability, firm conclusions could not be drawn. This review points out a positive effect on social behaviour and decrease in agitated behaviour, as the main benefits of DAT. Criticisms include trial design, a possible 'halo effect' on caregivers, or patient's pre-morbid condition towards dogs.

Williams & Jenkins[26] also reviewed the effectiveness of DAT in dementia care with implications for practice. Their conclusions suggest that visits by animals to care settings can be beneficial to patients, especially in their mental state, by reducing apathy, agitation and aggression. Moreover, DAT seems to relax patients and lowers their blood pressure. Yet, the authors criticize the evidence and suggest that stringent protocols and procedures need to be applied before any attempt for DAT is introduced to a homecare setting. Similarly, according to Abellán (2008)[27] DAT has a positive influence in both physical and emotional health parameters in people with dementia, i.e. blood pressure and self-esteem.

More recently, Bono et al.,[18] attempted to verify the clinical effect of a medium term DAT in 24 non-hospitalised dementia patients versus a control group for eight months. Their findings showed less deterioration in daily life activities, a slowing of the progression of AD, and absence of a depressive syndrome for the DAT group. The duration of their study informs the results, i.e. the slowing in deterioration of dementia due to DAT therapy. In these lines, Lobo & Serrano[28] developed theoretical and practical seminars on DAT, both for care-givers and clinicians. Their efficiency is yet to be assessed, but training people on DAT is a promising field that needs further development.

Most studies as shown in table 1, indicate that DAT is a beneficial complimentary therapyfor people with dementia improving their quality of life. It is evident that elderly people with Alzheimer's benefit from contact with dogs, especially in their own environment, since animals encourage social behavior and reduce aggression which is especially important in nursing homes. Furthermore, it is suggested thatDAT increases the level of social interaction amongst patients and where a residential dog cannot be sustained; a visiting one is also beneficial in the long term. The majority of the studies also suggest that physiological stressindicators improve with DAT, especially blood pressure. Moreover, a dog's presence seems not only to increase socialization, but to encourage more smiles, tactile contact and positive verbalizations with a decrease in sadness and anxiety.

Finally, Zafra-Tanaka et al.,[29] in their meta-analysis of 10 studies found that the effects of DAT in dementia carry low certainty of evidence. Furthermore, their analysis suggests that DAT has no effect on daily activities, depression, agitation, and cognitive impairment, although one RCT found a benefic effect for apathy. Yet, no study evaluated the possible 'side effects' of DAT.

DAT offers a promising non-pharmacological intervention for people with Alzheimer's. Yet, more RCTs are needed on the specific frequencies and duration of DAT sessions, as well as the optimal content of such therapeutic sessions. Moreover, it should be clarified whether this intervention should be a nurse-led task or whether the dog should be a 'permanent' fixture of the nursing home. Also, the potential for robotic pets to assist people with dementia needs further studying.[30-31]

CONCLUSIONS

People with dementia show a more cheerful mood with DAT and show significant increase in a variety of positive social behaviors such as smiles, looks, tactile gestures and verbalizations, i.e. DAT enhances pro-social behaviour. Furthermore, DAT is suggested to have a beneficial impact on physiological parameters as well, such as blood pressure management, heart rate and skin temperature. Yet, the psychological state of the patients is also noteworthy as DAT minimizes agitation, anxiety, apathy and aggression.

Although the methodological variability makes it difficult to draw hard conclusions most of the evidence supports the premise that DAT ameliorates symptoms in those suffering dementia. Nevertheless, DAT encourages positive behaviours and improves quality of life.

Overall, further research should examine which breed of dog is most beneficial at provoking positive effects on people with dementia. However, more RCTs are required in order to provide a definite guide to evidence based practice on the use of dogs in the treatment of people with dementia.

REFERENCES

1. Alzheimer's disease International (ADI). The estate of the art of dementia research: new frontiers. London. September 2018. Available at: https://www.alz.co.uk/research/WorldAlzheimerReport2018.pdf
2. Niu H., Álvarez-Álvarez I., Guillén-Grima F., Aguinaga-Ontoso I. Prevalence and incidence of Alzheimer's disease in Europe: A meta-analysis. Neurologia 2017; 32(8):523-532.
3. Artime A, Marínez, M. Llorens M. Terapiaasistida con perros. 2010. Available at: https://es.slideshare.net/davidpastorcalle/terapia-asistida-con-perros.
4. Kongable L, Buckwalter K, Stolley J. The effects of pet therapy on the social behavior of institutionalized Alzheimer's clients. Arch PsychiatrNurs. 1989;3(4):191-198.
5. Churchill M, Safaoui J, McCabe B, Baun M. Using a therapy dog to alleviate the agitation and desocialization of people with Alzheimer's disease. Journal of Psychosocial Nursing 1999; 37:16–22.
6. Kanamori M, Suzuki M, Yamamoto K. A day care program and evaluation of animal-assisted therapy (AAT) for the elderly with senile dementia. Am J Alzheimer's Dis Other Dem. 2001; 16:234-239.
7. Richeson N. Effects of animal-assisted therapy on agitated behaviors and social interactions of older adults with dementia. American Journal of Alzheimer's disease and Other Dementias 2003; 18:353–358.
8. Motomura N, Yagi T, Ohyama H. Animal assisted therapy for people with dementia. Psychogeriatrics 2004;4 (2):40-12.
9. Marx M, Cohen-Mansfield J, Regier N, Dakheel-Ali M, Srihari A,thein K. The Impact of different dog-related stimuli on engagement of persons with dementia. Am J Alzheimer's Dis Other Dem 2010;25:37-45.
10. Mossello E, Ridolfi A, Mello A, Lorenzini G, Mugnai F, Piccini C, Barone D, Peruzzi A, Masotti G, Marchionni N. Animal-assisted activity and emotional status of patients with Alzheimer's disease in day care. IntPsychogeriatr. 2011;23(6):899-905.
11. Nordgren L, Engström G. Effects of Animal-Assisted Therapy on Behavioral and/or Psychological Symptoms in Dementia: A Case Report. Am J Alzheimers Dis Other Demen. 2012;27(8):625-632.
12. Holthoff V, Beckmann A, Gerner A, Wesenberg S, Werner J, Marschner K, Ohnesorge M, Koch R, Nestmann F. Dog-assisted therapy for people with dementia: a randomized, controlled trial. 2008;9: 29-45.

13. Travers C, Perkins J, Rand J, Bartlett H, Morton J. An evaluation of dog- assisted therapy for residents of aged care facilities with dementia. Anthrozoös. 2013;26(2):213–225.
14. Majić T, Gutzmann H, Heinz A, Lang U, Rapp M. Animal-assisted therapy and agitation and depression in nursing home residents with dementia: a matched case-control trial. Am J Geriatr Psychiatry. 2013; 21(11):1052-1059.
15. Schall P, Espinoza R. Terapiaasistida con perrosenpacientes con demencia y SPCD institucionalizadosencentrosresidenciales de Toledo. EspañaInformaçãopsiquiátrica. 2015; 220:113–126.
16. Swall A, Ebbeskog B, LundhHagelin C, Fagerberg I. Can therapy dogs evoke awareness of one's past and present life in persons with Alzheimer's disease? Int J Older People Nurs. 2015;10(2):84-93.
17. Friedmann E, Galik E, Thomas S, Hall P, Chung S, McCune S. Evaluation of a pet-assisted living intervention for improving functional status in assisted living residents with mild to moderate cognitive impairment: a pilot study. Am J Alzheimers Dis Other Demen. 2015;30(3):276–289.
18. Bono A, Benvenuti C, Buzzi M, Ciatti R, Chiarelli V, Chiambretto P, Morelli C, Pinciroli M, Pini A, Prestigiacomo T, Rolleri C, Valena E. Effects of animal assisted therapy (AAT) carried out with dogs on the evolution of mild cognitive impairment. G Gerontol. 2015;63(1):32–36.
19. Olsen C, Pedersen I, Bergland A, Enders-Slegers MJ, Patil G, Ihlebaek C. Effect of animal-assisted interventions on depression, agitation and quality of life in nursing home residents suffering from cognitive impairment or dementia: a cluster randomized controlled trial. Int J Geriatr Psychiatry. 2016;31(12):1312–1321.
20. Krause-Parello C, Kolassa J. Pet therapy: enhancing social and cardiovascular wellness in community dwelling older adults. J Community Health Nurs. 2016;33(1):1–10.
21. Pope W, Hunt C, Ellison K. Animal assisted therapy for elderly residents of a skilled nursing facility. J. Nurs. Educ. Pract. 2016;6(9):56-62.
22. Swall A, Ebbeskog B, Hagelin C, Fagerberg I. Stepping out of the shadows of Alzheimer's disease: a phenomenological hermeneutic study of older people with Alzheimer's disease caring for a therapy dog. International Journal of Qualitative Studies on Health and Well-being 2017; 12:1-9.
23. Kårefjärd A., Nordgren L. Effects of dog-assisted intervention on quality of life in nursing home residents with dementia, Scandinavian Journal of Occupational Therapy 2019;26(6):433-440.
24. Filan S, Llewellyn-Jones R. Animal-assisted therapy for dementia: a review of the literature. IntPsychogeriatr. 2006; 18(4):597-611.
25. Perkins J, Bartlett H, Travers H, Rand J. Dog-assisted therapy for older people with dementia: A review. Australasian Journal on Ageing. 2008; 27(4):177–182.
26. Williams E, Jenkins R. Dog visitation therapy in dementia care: a literature review. Nursing Older People 2008; 20:31-35.
27. Abellán M. La terapiaasistidaporanimales: unanuevaperspectiva y línea de investigaciónen la atención a la diversidad. Indivisa. Boletin de Estudios e Investigación 2008; 2:117-143.
28. Lobo M, Serrano R. Programa de Salud.Terapiaasistidaporperros para enfermos de Alzheimer. Una parejasaludable. BibliotecaLascasas. 2018; 14:40-55.
29. Zafra-Tanaka J, Pacheco-Barrios K, Tellez W, Taype-Rondan A. Effects of dog-assisted therapy in adults with dementia: a systematic review and meta-analysis BMC Psychiatry. 2019; 19:41-46.
30. Muñoz L, N. Máximo B, Valero A, Atín A, Varela D, Ferreiro G. Animal assisted interventions in neurohabilitation: a review of the most recent literature. Neurologia 2015; 30(1):1-7.
31. Tabares S, Castro F, Sánchez S, Gómez A. Estado del arte sobrelosefectos de la terapiaasistida con per-

rosenel tratamiento de enfermos de Alzheimer. INFAD
2013; 2(1):271-281.

ANNEX

FIGURE 1. Flow chart of systematic search

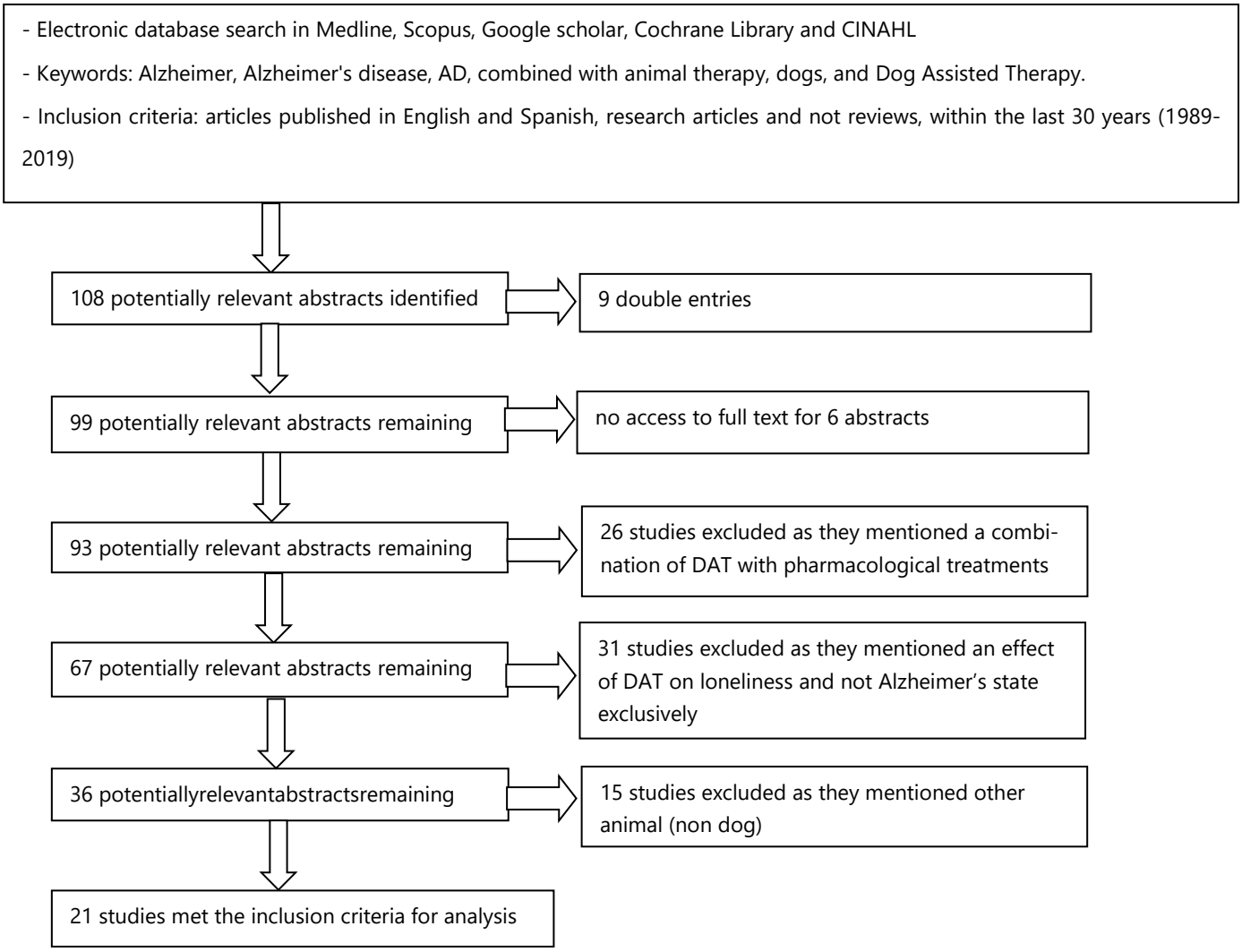

TABLE 1. Summary of studies of dog-assisted therapy in people with Alzheimer's disease

Authors & Year	*Title*	*Country*	*Methods - Outcome*	*Impact*
Kongable et al., 1989[4]	The effects of pet therapy on the social behavior of institutionalized Alzheimer's clients.	USA	12 Alzheimer's (AD) residents of a Special Care Unit in a large midwest Veterans' Home were observed for the effects of the presence of a pet dog on 8 social behaviors: smiles, laughs, looks, leans, touches, verbalizations, name-calling, and others. Results showed that the presence of the dog increased the number of total social behaviors of the AD clients.	↑
Churchill et al., 1999[5]	Using a therapy dog to alleviate the agitation and desocialization of people with Alzheimer's disease	USA	Used a sample of 28 patients who were videotaped for two 30-minute sessions of researcher alone or researcher + dog in common area	↑
Kanamori et al., 2001[6]	A day care program and evaluation of animal-assisted therapy (AAT) for the elderly with senile dementia.	Japan	7 patients were assigned to six biweekly sessions of AAT and a control group of 20. The evaluation of salivary CgA, as a mental stress index, showed a decreasing tendency in the AAT group. Our findings demonstrate the usefulness of using several methods for evaluation of the changes in patients given AAT.	↑
Richeson, 2003[7]	Effects of animal-assisted therapy on agitated behaviors and social interactions of older adults with dementia.	USA	A group of 15 patients with 1 hour DAT sessions daily with visiting dog for 3 weeks, data collection at baseline, after 3 weeks of DAT and 2 weeks after the end of DAT	↑
Motomura et al., 2004[8]	Animal assisted therapy for people with dementia	Japan	8 patients from a nursing home received Dog therapy with two dogs from the Japanese Rescue over four consecutive days. The results indicated no significant difference in the irritability scale, the depression scale, activity of daily living and mini mental state examination. However, most patients had a good impression of dog therapy, and all improved their apathetic state.	↑
Artime et al., 2010[3]	Dogs assisted therapy	Spain	Results of this study suggest that the effect of animals in promoting relaxation, socialization and reducing agitation are significant for patients with Alzheimer's.	↑
Marx et al., 2010[9]	The Impact of different dog-related stimuli on engagement of persons with dementia.	USA	56 residents of 2 suburban Maryland nursing homes were assigned to engagement with dog-related stimuli. Mean engagement duration was significantly lower for the small dog. Highest mean engagement duration was found for the puppy video, followed by the real dog and lowest was for the dog-coloring activity. Positive attitudes were found toward the real dogs, robotic dog, the puppy video, and the plush dog. No significant differences were found in engagement duration among our dog-related stimuli.	↑
Mosselo et al, 2011[10]	Animal-assisted activity and emotional status of patients with Alzheimer's disease in day care.	Italy	10 patients attending an Alzheimer Day Care Center participated in a repeated measures study, which included: 2 weeks' pre-intervention, 3 weeks' control activity with plush dogs (CA), and 3 weeks' AAA. The group that received AAA was associated with a decrease in anxiety and sadness and an increase in positive emotions and motor activity in comparison with a control activity.	↑
Nordgren &Engström, 2012[11]	Effects ofanimal-assisted therapy on behavioral and/or psychological symptoms in dementia: a case report.	Sweden	This small pilot study is on an 84-year-old woman with dementia, systematically trained with DAT for 8 weeks. Some effects on walking, movement and cognitive state were observed.	↑

Holthoff et al., 2013[12]	Dog-assisted therapy for people with dementia: A randomized, controlled trial.	Germany	60 patients with dementia living in two local nursing homes were randomly assigned to either one weekly session of a standardized dog-assisted therapy session or received treatment-as-usual for 6 months. The standardized dog-assisted therapy program had a positive impact on pro-social behavior and reduced neuropsychiatric symptoms.	↑
Travers et al., 2013[13]	An evaluation of dog- assisted therapy for residents of aged care facilities with dementia.	Australia	55 residents with mild to moderate dementia living in 3 residential aged care facilities completed an 11-week trial of the interventions, i.e. human-therapist plus dog-therapy versus human-therapist-only intervention. Participants in the dog-assisted intervention showed significant improvements on a measure of QOL. This study provides some evidence that dog-assisted therapy may be beneficial for some residents of aged care facilities with dementia.	↑
Majić et al., 2013[14]	Animal-assisted therapy and agitation and depression in nursing home residents with dementia: a matched case-control trial.	Germany	65 nursing home residents with dementia with matched pairs were randomly assigned to either treatment as usual or treatment as usual combined with Animal Assisted Therapy, administered over 10 weekly sessions. The study found that residents had stable symptoms of agitation, aggression, and depression over a 10-week period when AAT was combined with standard care. This indicates that AAT seems to have helped residents avoid developing more severe symptoms.	↑
Schall& Espinoza, 2015[15]	Terapiaasistida con perrosenpacientes con demencia y SPCD institucionalizadosencentrosresidenciales de Toledo.	Spain	A prospective multicenter study performed at two residences in Spain, with 24 patients with dementia, randomly divided into an intervention group with control group without DAT, besides a healthy control group. The intervention consisted of 16 sessions, 2 sessions per week for 35 minutes in duration. MMSE, Modified Barthel, Cornell, Quality Scale, NPI and OPI were used before starting the therapies and at the end of the sessions. The DAT therapy group was effective at reducing agitation and aggressiveness according and improved quality of life for patients with dementia having DAT.	↑
Swall et al., 2015[16]	Can therapy dogs evoke awareness of one's past and present life in persons with Alzheimer's disease?	Sweden	Video recorded sessions were conducted for each visit of the dog and its handler to a person with AD (10 times/person). Results showed a main theme 'Being aware of one's past and present existence', meaning to connect with one's senses and memories and to reflect upon these with the dog. The time spent with the dog showed the person recounting memories and feelings, and enables an opportunity to reach the person on a cognitive level in a way that might increase quality of life and well-being in persons with dementia.	↑
Friedmann et al., 2015[17]	Evaluation of a pet-assisted living intervention for improving functional status in assisted living residents with mild to moderate cognitive impairment: a pilot study.	USA	Cognitively impaired residents randomized to 60-90 minute sessions. Group A (n = 22), interventionist encourages residents to perform skills with the visiting dog and group B (n = 18) reminiscing twice/week for 12 weeks. In linear mixed models, group A showed that physical activity depressive symptoms improved more. Evidence supports that this program helps preserve/enhance function of residents with Cognitive Impairment.	↑
Bono et al., 2015[18]	Effects of animal assisted therapy carried out with dogs on the evolution of mild cognitive impairment.	Italy	24 out-patients diagnosed with early stage or mild AD wererandomised into two groups: DAT treatment with dogs and Controls both followed for eight months. In DAT group, there was less deterioration in daily life activities, a slowing of the progression	↑

			of AD, and absence of a depressive syndrome.	
Olsen et al., 2016[19]	Effect of animal-assisted interventions on depression, agitation and quality of life in nursing home residents suffering from cognitive impairment or dementia: a cluster randomized controlled trial	Norway	58 participants were randomized to either AAA with a dog or a control group with treatment as usual. A significant effect on depression and QoL was found for participants with severe dementia at follow-up. For QoL, a significant effect of AAA was also found immediately after the intervention. No effects on agitation were found. Animal-assisted activities may have a positive effect on symptoms of depression and QoL in older people with dementia, especially those in a late stage.	↑
Krause-Parello., 2016[20]	Pet therapy: enhancing social and cardiovascular wellness in community dwelling older adults.	USA	A crossover design was used to examine changes in blood pressure and heart rate before and after a pet therapy visit versus a volunteer-only visit in 28 community dwelling older adults. Study findings supported that pet therapy significantly decreased blood pressure and heart rate. Ultimately, the findings supported the notion that community health nurses should consider developing and implementing pet therapy programs in the communities they serve.	↑
Pope et al, 2016[21]	Animal assisted therapy for elderly residents of a skilled nursing facility.	USA	The purpose of the study was to compare the effectiveness of DAT versus human interaction only on social behaviors and engagement among elderly patients with dementia in long-term care facility. Following random assignment to groups, the participants experienced two visits per week over a two-week time period of either animal therapy visits or human interaction visits. One week with no activities then followed then with alternate animal therapy and human interaction visits. The human interaction visits consisted of conversation and reading from and looking at pictures in a newspaper. During animal visits, participants were encouraged to touch, pet, brush, and talk to the dogs. In this study, DAT increased positive social behaviors resulting in fewer incidents requiring staff intervention.	↑
Swall, et al., 2017[22]	Stepping out of the shadows of Alzheimer's disease: a phenomenological hermeneutic study of older people with Alzheimer's disease caring for a therapy dog	Sweden	The study recorded a person with Alzheimer's with his dog. This study is said that minimizing agitation and anxiety, induced behaviours such as apathy and aggression, while improving their quality of life and their social interaction with others	↑
Kårefjärd, 2018[23]	Effects of dog-assisted intervention on quality of life in nursing home residents with dementia	Sweden	59 nursing home residents prior to and after a dog-assisted intervention were examined. Results indicated that dog-assisted interventions can have positive effects on quality of life in nursing home residents with moderate to severe dementia.	↑