



Pet Ownership and Human–Animal Interaction in an Aging Population: Rewards and Challenges

Marie-José Enders-Slegers & Karin Hediger

To cite this article: Marie-José Enders-Slegers & Karin Hediger (2019) Pet Ownership and Human–Animal Interaction in an Aging Population: Rewards and Challenges, *Anthrozoös*, 32:2, 255-265, DOI: [10.1080/08927936.2019.1569907](https://doi.org/10.1080/08927936.2019.1569907)

To link to this article: <https://doi.org/10.1080/08927936.2019.1569907>



© 2019 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 19 Mar 2019.



Submit your article to this journal [↗](#)



Article views: 31



View Crossmark data [↗](#)



Citing articles: 1 View citing articles [↗](#)

Pet Ownership and Human–Animal Interaction in an Aging Population: Rewards and Challenges

Marie-José Enders-Slegers* and Karin Hediger†

*Faculty of Psychology and Educational Sciences, Department Anthrozoology, Open University, the Netherlands

†Faculty of Psychology, Department of Clinical Psychology and Psychotherapy, University of Basel, Switzerland

Address for correspondence:

Prof. Dr. Marie-José
Enders-Slegers,

Faculty of Psychology and
Educational Sciences,
Department Anthrozoology,
Open University,
the Netherlands.

E-mail:

Marie-Jose.Enders@ou.nl

A pdf of this paper can also
be downloaded without
charge. Gold Open Access
sponsored by WALTHAM™.

This is an Open Access article
distributed under the terms of
the Creative Commons
Attribution-NonCommercial-
NoDerivatives License
(<http://creativecommons.org/licenses/by-nc-nd/4.0/>),
which permits
non-commercial
re-use, distribution, and
reproduction in any medium,
provided the original work is
properly cited, and is not
altered, transformed, or built
upon in any way.

ABSTRACT Older adults in most developed countries can now expect to live nearly 80 years without significant disability. To maximize the quality of the years after retirement, societies, governments, and organizations are seeking strategies to help older adults maintain their mental and physical health, and retain their independence. Increasingly, the impact of pet ownership and other forms of human–animal interaction in healthy aging are discussed and investigated. In the Western world, more than 50% of households own one or more pets. The popularity of pets means they are well positioned to provide opportunities for companionship and nurturance. Since social networks tend to decrease as people age, pets may fill some gaps. While it is common to read about the benefits of pets and human–animal interactions, pet ownership in older age is also related to challenges and animal welfare concerns. This paper aims to briefly review the benefits and then explore risks and challenges related to pet ownership in older adulthood. In addition, we present strategies for maintaining beneficial pet ownership and human–animal interaction for older adults.

Keywords: aging, health, human–animal interaction, older adults, pet ownership, quality of life, risk, social, wellbeing



The older adult population is growing. In Europe, about 20% of the population is over 65 years old (Eurostat, n.d.) and that percentage is expected to double by 2050. The U.S. Census Current Population Report also states that the older adult population will double by 2050, from 43.1 million to 83.7 million, due to aging of the “baby boomer” generation and increased life expectancy, which is around 80 years in developed countries (Ortman, Velkoff, & Hogan, 2014). Aging brings challenges. Retirement, reduced income, changes in lifestyle or

housing, and the decline of health and physical strength all constitute threats to the health and the quality of life for older adults. Diminishing social networks by loss of colleagues, friends, and relatives increases the risk of isolation and loneliness (Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015). Moreover, Western society is changing. Families are getting smaller, single-households are increasing, and family members sometimes live geographically far apart from each other; thus, caring for vulnerable parents can be a challenge. In some parts of the world, governments are reducing healthcare expenditure for the aging. In the Netherlands for example, this recently resulted in the closure of most of the homes for older adults, encouraging them to live on their own as long as possible.

Paradigms about aging are also changing in our society. The focus on disease, diminished capacity, and dependency has shifted to a more positive one that looks at increasing quality of life by active aging and the active involvement of older adults in society (WHO, 2002). The World Health Organization (WHO) defines healthy aging as a process of developing and maintaining the functional ability that enables wellbeing in older age. Wellbeing is considered in a broad sense and includes physical and psychological health, societal embedding, and subjective domains such as happiness, satisfaction, and fulfillment (WHO, 2015). Older adults themselves appear to define wellbeing in this same way. For them, wellbeing is mostly correlated with having a role or identity, relationships, the possibility of enjoyment, autonomy, security, and the potential for personal growth, while they emphasize having an illness or chronic condition as less important (Douma, Steverink, Hutter, & Meijering, 2017).

Healthy aging demands active involvement of the individual to optimize opportunities for health, security, and participation in society, but also needs the involvement of governments (WHO, 2002). The WHO (2002) advised governments to reduce risk factors associated with major diseases and to foster factors that promote behavioral health and physical fitness, such as a healthy lifestyle, adequate access to social care, and health services. To accomplish this, governments should promote protective factors for behavioral and cognitive functioning, including lifelong education, adequate nutrition, and sufficient exercise and protective factors for psychosocial functioning including positive affect, effective coping, and control over life outcomes. Governments also should provide opportunities for living independently, having sufficient income, and being able to participate in a society that respects older adults as valuable fellow citizens (WHO, 2002). These WHO recommendations show how societies, governments, and organizations can help older adults by developing strategies to retain independence and social inclusion of older adults.

One such strategy to help older adults maintain autonomy, social inclusion, and psychological and physical health is to enable pet ownership for those who want it, since pet ownership lowers some of the risks already mentioned that reduce quality of life (Gee, Mueller, & Curl, 2017). However, having pets in older age is also linked to challenges and risks on both the human and the animal side. In this paper, we first briefly review the benefits of pet ownership for older adults. Second, we address potential risks and challenges, and third, we propose strategies for maintaining beneficial pet ownership and ongoing human–animal interaction for older adults.

Benefits of Pet Ownership in Older Adulthood

Previous reviews have compiled research investigating the effects of pet ownership and human–animal interaction for older adults (Gee et al., 2017; McNicholas, 2014) showing several benefits. Pets motivate people to engage in an active and healthy lifestyle (Knight & Edwards, 2008)

and enhance physical and cognitive functioning (Friedmann, Thomas, Son, Chapa, & McCune, 2013). Studies have found relationships between pet ownership and increased physical activity and mobility maintenance in older adults (Curl, Bibbo, & Johnson, 2017; Dall et al., 2017; González Ramírez & Landero Hernández, 2014; Thorpe et al., 2006). This may also have implications for enhancing cognitive functioning since physical activities that maintain cardiovascular fitness increase cerebral blood flow and oxygen delivery to the brain, increasing neuron formation and maintaining brain volume (Carvalho, Rea, Parimon, & Cusack, 2014; Etnier, Nowell, Landers, & Sibley, 2006). Moreover, pets help in establishing a structured daily life: they require regular meals, walks, grooming, and attention, all of which helps to structure a day with meaningful activities and also provides cues for self-care activities (Rosenkoetter, 1991).

Pets stimulate positive emotions such as pleasure and foster feelings of being protected and safe, both inside and outside the home (Enders-Slegers, 2000; Siegel, 1990). Dogs are viewed as providers of safety, security, and protection, with older adult perceiving themselves to be safer when walking accompanied by a dog and also when being at home (Knight & Edwards, 2008). Pets create opportunities for their owners to make new social relationships with people of different demographic and socioeconomic backgrounds (Eddy, Hart, & Boltz, 1988; McNicholas & Collis, 2000; Wood, Giles-Corti, Bulsara, & Bosch, 2007). Thus, they act as social catalysts and help build and maintain social networks. Individuals with pets are more likely to know their neighbors, and about 40% of owners reported receiving social support from people they met through their companion animals (Wood et al., 2015). Among community-dwelling older adults, pets stimulate communication (Rogers, Hart, & Boltz, 1993) and often serve as a conversation topic (Rosenkoetter, 1991). Animals can further directly provide social support (Allen, Blasovich, & Mendes, 2002; Allen, Shykoff, & Izzo, 2001; Enders-Slegers, 2000), reduce depression (Souter & Miller, 2007), and diminish the negative effects of bereavement (Garrity, Stallones, Marx, & Johnson, 1989).

The increased risk of isolation and loneliness in older adults has a profound impact on health and wellbeing, and is often associated with depression (McCall & Kintziger, 2013) and reduction in mobility and daily living activities (Perissinotto, Stijacic Cenzer, & Covinsky, 2012). A recent meta-analysis of 70 studies reported the likelihood of death as 26% higher for those reporting loneliness, 29% higher for those experiencing social isolation, and 32% higher for those living alone (Holt-Lunstadt et al., 2015).

Living with a pet provides company and reduces feelings of loneliness (Stanley, Conwell, Bowen, & Van Orden, 2013). In a study conducted in the Netherlands, independently living older adults (70–80 years old) reported feelings of attachment and emotional closeness as the most salient elements of their relationships with pets (Enders-Slegers, 2000). Similarly, older adults in the United States named companionship and affection as the primary reasons for having a pet (Smith, Seibert, Jackson, & Snell, 1992). Other important aspects of the relationship with pets included reassurance of worth, reliable alliance, feelings of safety, and the opportunity for nurturance. For those living alone, pets offer some of the emotional support and opportunities for nurturance previously provided by human social networks. Providing nurturance to others can create a desirable feeling of being needed and valued and can enhance our feelings of self-worth. However, at old age this opportunity to care for others decreases. Pets are often seen as family members (Ryan & Ziebland, 2015; Walsh, 2009), and since they are completely dependent on their owners, they meet the need for nurturance. Indeed, 70- to 80-year-old pet owners report that caring for their animals makes them feel needed, responsible, and valued (Enders-Slegers, 2000). Thus, pets can add to meaningfulness and purpose in life.

In addition, research has demonstrated that pet ownership is associated with reduced risk for cardiovascular disease or poor outcomes in individuals with cardiovascular disease (Friedmann, Katcher, Lynch, & Thomas, 1980; Friedmann et al., 2013; Levine et al., 2013). Interestingly, age seems to modify the association between dog ownership and myocardial infarction, with a lower risk in older age groups compared with younger age groups of dog owners (Mubanga et al., 2017).

It's important to acknowledge, however, that not all studies of pet ownership in older adulthood have reported benefits. Parslow, Jorm, Christensen, Rodgers, and Jacomb (2005) reported from their survey of 2,251 older people (60–64 years) that pet ownership conferred no health benefits. Further, in a recent study, dog owners had a significantly higher likelihood of ever having been depressed or having experienced depression (Mueller, Gee, & Bures, 2018). In all these cross-sectional studies reporting beneficial or negative associations with pet ownership, the causality is not clear. More research is needed to investigate if pet ownership 1) leads to better physical and mental health or puts a person at risk of developing depression, or 2) if these results just reflect the tendency of healthier or more depressed individuals to acquire a pet as a result of their condition (Friedmann & Gee, 2018). Although these mechanisms are not clear yet, the current body of data suggests that pet ownership is associated with some significant benefits for older adults and that companion animals can help to maintain and enhance the quality of life of older adults (Gee et al., 2017; McNicholas, 2014).

Risks and Challenges of Pet Ownership in Older Adulthood

While pet ownership can be beneficial in all stages of life, it also bears risks and challenges, with some of them specifically linked to the older age of the owners. An important issue is the economic aspect. Responsible pet ownership costs money. Pet care and pet healthcare, especially for older animals, can mean a financial burden for older adults whose financial situation is likely to be weaker than before retirement. A pet healthcare insurance premium with a monthly fixed amount might be easier to manage than large, unexpected veterinary bills, but may still not be financially affordable.

Another challenge may be attitudes of others toward pet ownership for older people: family members often discourage pet ownership, and formal caregivers, such as doctors or nurses, may have negative attitudes because of fear of zoonoses, infections, or extra workload. However, the risk of zoonoses, diseases that are transmitted between animals and humans through touching or keeping pets, is quite small except for certain populations who are more susceptible due to compromised immune systems or other conditions (CDC, 2016a, 2016b). Thus, older adults don't necessarily have an increased vulnerability, depending on their health status. But older people do have a greater risk of injuries and fractures due to falls associated with dogs and cats (Stevens, Teh, & Haileyesus, 2010; Willmott, Greenheld, & Goddard, 2012). Therefore, the environment needs to be adapted inside and outside for older people living with a dog or a cat, to minimize the risks of falling when being with an animal or walking a dog.

Moreover, it must be noted that pet ownership is not a uniformly desired or positive experience, and simply having a pet present in the home does not guarantee a strong bond or affectionate relationship between the owner and the animal. There is increasing evidence that the quality of the pet–owner relationship is a factor in determining whether or not pet ownership confers benefits (Chur-Hansen, Winefield, & Beckwith, 2009; Garrity et al., 1989), and extreme attachments may also be associated with less desirable health outcomes (Chur-Hansen et al., 2009). These are important considerations for adult children, in particular, who

may be thinking about adopting a pet to provide their parents company. Pets are a big commitment, and it is never a good idea to surprise someone with one. The potential owner should always be involved in the decision to adopt, and in the selection of, a new pet.

Beyond these risks, there are more complex health and safety concerns about pet ownership among older adults. The strong bond with their pet might cause older adults to jeopardize their own health, spending their limited money to provide food or care for the companion animal rather than for themselves (Abrahms, 2015), or they may refuse to be hospitalized because they are not willing to leave their pet without care (McNicholas et al., 2005). Adding questions about pet ownership to conventional medical intake forms and consultations could be a helpful measure, as this would provide opportunities to address pet-care planning before hospitalization. Healthcare professionals are becoming more aware of the needs of pet owners, and organizations like the Mayor's Alliance for New York City's Animals have compiled resources for hospital staff to help patients with companion animals ensure that care is provided for them during hospitalization (Mayor's Alliance for NYC's Animals, 2015). For some people, however, the thought of their beloved companion animal being in a boarding kennel may still be enough to prevent them from seeking medical care.

Pets can also be a reason to remain in a home that is no longer suitable for an older adult (Smith et al., 1992) or delay a transition to assisted-living out of concern for the animal (Stevenson, 2017), since many housing facilities refuse the keeping of animals. Rehoming a pet and the subsequent absence of the animal can lead to severe grief and depressive symptoms (Hunt, Al-Awadi, & Johnson, 2008). It would therefore be important to provide more assisted-living places for older adults which allow the keeping of pets. In cases where older adults are unable to provide all necessary pet care independently, caregivers are often called upon to assist. This can be an extra burden, and informal caregivers often are not available or might not be able to fulfill animal-care tasks. However, the presence of the companion animal may also enhance the relationship between caregiver and recipient. A pet can create topics for conversation, distract from pain and sorrow, and provide motivating activities and pleasure and comfort in home situations, as well as in institutional environments. Nevertheless, the daily care required for pets can be taxing for caregivers, particularly if the human-care recipient also requires extensive management, or the animal itself is experiencing health problems and age-related declines.

Caregivers may also be faced with the painful prospect of having to rehome pets or the difficult task of finding pet-friendly assisted-living care for their loved ones. Given these potential challenges, it is important for older adults to have discussions as early as possible with those closest to them about how pets should be cared for if the older adult becomes too ill to provide care for the animal or needs to move to a care facility (Rotolo, n.d.). Having a plan in place creates peace of mind for pet owners and their loved ones, ensures the animal's welfare, and helps to ensure that the owners and their companion animals will more easily transition to the next phase of each of their lives (Rotolo, n.d.). The development of guidelines and resources to help families talk through some of these challenges and create pet-care plans would be of tremendous benefit.

Ensuring the Welfare of Pets

Aging often leads to a decline in physical health and strength. Thus, providing adequate care for a pet might become a challenge for older adults, resulting in animal neglect, coexisting with the inability to take care of oneself (Lockwood, 2002). Moreover, it is not unusual for cats and dogs to live for 15 years or more, and what is required to meet their basic needs may

change across its lifespan. Aging pets may require frequent visits to the veterinarian and physical assistance of the owner. For example, the owner may need to help a pet ascend or descend stairs, assistance that the older owner may not be able to give. Pets such as dogs also require space, and if an owner has to downsize housing, this might lead to problems. However, cats or smaller animals such as guinea pigs or fish may be excellent companions in those cases and in cases where the owner has some physical limitations. When considering adopting a pet, it is necessary to assess not only one's current health and living situation, but also how one's life might change in the relatively distant future, and the care that an aging companion animal might require. It is important for older adult pet owners, and those closest to them, to understand the potential animal welfare issues that can arise, and be prepared to have what may be difficult conversations about how the animals will be cared for if the need arises.

However, Pitteri et al. (2014) recently studied the quality of life of dogs owned by older adults in Northern Italy. The authors found very limited concerns about the adoption of dogs later in life. The quality of life of the dog did not depend on the owner's age but on the amount of information available about canine healthcare, rural or city living contexts, and the level of attachment in the pet–owner relationship.

Only recently, attention has been brought to the connection between abuse of older adult caregivers and animal cruelty. A survey of adult protective services supervisors, conducted by the Humane Society of the United States and the National Center on Elder Abuse, found that more than 35% of respondents reported that older clients talked about their pets having been threatened, injured, killed, or denied care by their caregivers (e.g., their adult children), and more than 45% of care supervisors encountered intentional abuse or neglect of animals by caregivers when visiting clients (Lockwood, 2002). Over 75% of respondents noted that clients were concerned for their pets' welfare and would refuse healthcare service and resist moving to a nursing home if their companion animals could not be accommodated (Lockwood, 2002).

Human–Animal Interaction in Older Adulthood: Strategies for and Alternatives to Pet Ownership

At an older age, there are many reasons for not having a pet: changed lifestyle, financial burdens, too much cleaning, health problems and physical impairments, no permission in the place of residence, or grief over the loss of a previous pet (AHA, 2012). Older adults may also worry about what will happen if they outlive their pets, or when they become disabled or otherwise unable to provide care (Anderson, Lord, Hill, & McCune, 2015). They fear the thought of placing their beloved pet in other homes or shelters.

For those who can no longer meet their pets' needs, organizations can offer ambulant home care for them (e.g., Cherished Pets Australia). For example, help can be requested for bringing the pet to the veterinarian or walking the dogs (<https://www.cherishedpetcare.com.au>). However, such a service, if not provided by informal caretakers, such as neighbors, family members, or a volunteer organization, might be very expensive. Society has created new models for such cases. For example, in Switzerland, there are organizations that track the time that people voluntarily invest in helping older adults in need. This time investment can be exchanged for free help from others when needed later in life (e.g., Stiftung Zeitvorsorge or Verein KISS). Moreover, there are new forms of lifestyle evolving like apartment-sharing of older people who then also share the care for a pet. These are examples of strategies for ongoing pet ownership that is beneficial for both humans and animals.

An alternative to pet ownership is daycare for animals that belong to others. For example, in the Netherlands, the organization “Opa’s en Oma’s Passen Op Een Huisdier” (OOPOEH: grandpa and grandma looking after your pet) connects older foster “pet parents” with dogs and cats that need daycare when the owners work. Another possibility for older adults to experience human–animal interaction without owning a pet is volunteering at a local animal shelter or other animal-care facility. Such models are a pleasant solution for older adults who want pets and enjoy spending time with them, but don’t want or can’t have the full responsibility of owning one. Some organizations also offer dog visiting programs for older people living at home, or combine ambulant healthcare with animal-assisted interventions (e.g., dogs accompanying home care [Spitex] professionals in Switzerland). In the future, such creative models of human–animal interaction will be increasingly needed to overcome the challenges and barriers of keeping pets in older adulthood. However, these ideas and new concepts must be addressed by the community, need involvement of governments and political systems, and should also be taken into account in areas such as urban planning and housing structures.

Also, human–animal interactions in all kinds of healthcare facilities are more and more commonly practiced and should be encouraged and supported. The most prominent forms are dog visiting programs or residential animals in nursing homes. A recent survey in Switzerland showed that 82% of the nursing homes had resident animals, with cats being the most common species, followed by fish, dogs, birds, farm animals, and rodents (Häberli, 2018). Moreover, 50% of the nursing homes stated that they offer animal-assisted activities such as visiting programs, and 11% offer animal-assisted therapy (Häberli, 2018). Research investigating the effects of companion animal contact for older people in nursing homes has reported positive effects on agitation, depression, quality of life, and balance (Banks & Banks, 2002; Bernabei et al., 2013; Berry et al., 2012; Karefjord & Nordgren, 2018; Le Roux & Kemp, 2009; Nordgren & Engström, 2014; Olsen, Pedersen, Bergland, Enders-Slegers, & Ihlebæk, 2016; Olsen, Pedersen, Bergland, Enders-Slegers, Patil et al., 2016). However, the existing body of research on animal-assisted interventions, visiting animals, and resident animals in long-term care facilities is not yet very rigorous (Friedmann & Gee, 2018). Well-controlled, larger-scale studies are needed to advance our knowledge of the benefits and risks of these programs for patients and participating animals.

It is not always clear whether such programs in nursing homes are accompanied by protocols addressing animal welfare, hygiene, and the safety of human and animal participants. A study in the Netherlands demonstrated that most of the participating nursing homes offered animal-assisted interventions within a recreational program, but did not have protocols for animal welfare, zoonoses, hygiene, and safety, nor did they employ specific selection criteria for participating animals (Schuurmans, Enders-Slegers, Verheggen, & Schols, 2016). In this growing field, regulation is very much needed: the human–animal team that visits frail, older adults should in all cases be educated on the characteristics of the specific population and how to work safely with their well-trained dog, while safeguarding human and animal wellbeing and health. There are examples of standards for keeping animals in nursing homes that are emerging, but these have to be further developed. Ideally, these protocols should be adopted by all healthcare facilities and reviewed on a regular basis.

Limitations and Future Directions

In this paper, we have outlined some of the potential risks and challenges to pet ownership for older adults that arise out of the questions in the existing literature and are based on our own practical experiences, as well as some of the positive directions in the field. We do not claim

the information in this paper to be exhaustive or complete. There is a lack of research addressing possible negative effects and challenges of pet ownership for older adults. In addition, future research should test the effectiveness of the here-proposed strategies and develop new models for overcoming the challenges. In addition to further research, we strongly recommend further development of special pet-care programs and services for and by older adults, and the implementation of protocols and guidelines for the admission of pets and visiting animals to assisted-living and institutional-care settings. Societies, governments, and organizations should create opportunities for lifelong access to animal companionship and create structures that make this possible in a safe way for both the humans and the animals.

Summary and Conclusions

The ability to interact with animals should be preserved throughout the course of life for those who enjoy interacting with animals, whether through pet ownership or other forms of human–animal interaction. Pet ownership can support the retention of independence and quality of life for older adults by aiding in the preservation of physical and mental health, offering companionship, facilitating active social engagement, providing structure, daily routines, opportunities for nurturance, and by enhancing feelings of safety (Gee et al., 2017; McNicholas, 2014). However, whether living independently, receiving assistance in the home, or living in an assisted-living or nursing home facility, each arrangement results in specific challenges for the older adult pet owner and most likely also involves the caregivers. Ensuring human health and well-being as well as animal health and welfare is of vital importance, regardless of the living situation of older adults. While the results of many studies encourage pet ownership for older adults, the potential benefits must be weighed against the risks for both the involved humans and animals, on a case-by-case basis.

Conflicts of Interest

The authors declare no conflict of interest.

References

- Abrahms, S. (2015). Helping senior parents care for their pets. Retrieved from <https://www.aplaceformom.com/blog/3-31-15-helping-senior-parents-care-for-pets/>.
- AHA. (2012). *Keeping pets (dogs and cats) in homes: A three-phase retention study. Phase 1: Reasons for not owning a dog or cat*. Retrieved from <https://www.americanhumane.org/app/uploads/2016/08/aha-petsmart-retention-study-phase-1.pdf>.
- Allen, K., Blascovich, J., & Mendes, W. B. (2002). Cardiovascular reactivity and the presence of pets, friends, and spouses: The truth about cats and dogs. *Psychosomatic Medicine*, *64*, 727–739.
- Allen, K., Shykoff, B. E., & Izzo, J. L. (2001). Pet ownership, but not ace inhibitor therapy, blunts home blood pressure responses to mental stress. *Hypertension*, *38*, 815–820.
- Anderson, K. A., Lord, L. K., Hill, L. N., & McCune, S. (2015). Fostering the human–animal bond for older adults: Challenges and opportunities. *Activities, Adaptation & Aging*, *39*, 32–42.
- Banks, M. R., & Banks, W. A. (2002). The effects of animal-assisted therapy on loneliness in an elderly population in long-term care facilities. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, *57*, M428–M432.
- 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*, 762–773.
- Berry, A., Borgi, M., Terranova, L., Chiarotti, F., Alleva, E., & Cirulli, F. (2012). Developing effective animal-assisted intervention programs involving visiting dogs for institutionalized geriatric patients: A pilot study. *Psychogeriatrics*, *12*, 143–150.

- Carvalho, A., Rhea, I. M., Parimon, T., & Cusack, B. J. (2014). Physical activity and cognitive function in individuals over 60 years of age: A systematic review. *Clinical Interventions in Aging*, 9, 661–682.
- CDC. (2016a, 13 May). Diseases from cats. Healthy pets healthy people. Retrieved from <https://www.cdc.gov/healthypets/pets/cats.html-tabs-860446-3>.
- CDC. (2016b, 14 July). Diseases from dogs. Healthy pets healthy people. Retrieved from <https://www.cdc.gov/healthypets/pets/dogs.html-tips>.
- Chur-Hansen, A., Winefield, H., & Beckwith, M. (2009). Companion animals for elderly women: The importance of attachment. *Qualitative Research in Psychology*, 6, 281–293.
- Curl, A. L., Bibbo, J., & Johnson, R. A. (2017). Dog walking, the human–animal bond and older adults' physical health. *Gerontologist*, 57, 930–939.
- Dall, P. M., Ellis, S. L., Ellis, B. M., Grant, M., Colyer, A., Gee, N. R., ... Mills, D. S. (2017). The influence of dog ownership on objective measures of free-living physical activity and sedentary behaviour in community-dwelling older adults: A longitudinal case-controlled study. *BMC Public Health*, 17, 496. <https://doi.org/10.1186/s12889-017-4422-5>.
- Douma, L., Steverink, N., Hutter, I., & Meijering, L. (2017). Exploring subjective well-being in older age by using participant-generated word clouds. *The Gerontologist*, 57, 229–239.
- Eddy, J., Hart, L. A., & Boltz, R. P. (1988). The effects of service dogs on social acknowledgments of people in wheelchairs. *Journal of Psychology: Interdisciplinary and Applied*, 122, 39–45.
- Enders-Slegers, M.-J. (2000). The meaning of companion animals: Qualitative analysis of the life histories of elderly cat and dog owners. In A. L. Podberscek, E. S. Paul, & J. A. Serpell (Eds.), *Companion animals and us: Exploring the relationships between people and pets* (pp. 237–256). Cambridge: Cambridge University Press.
- Etnier, J. L., Nowell, P. M., Landers, D. M., & Sibley, B. A. (2006). A meta-regression to examine the relationship between aerobic fitness and cognitive performance. *Brain Research Reviews*, 52, 9119–9130.
- Eurostat. (n.d.). A look at the lives of the elderly in the EU today. Retrieved from <http://ec.europa.eu/eurostat/cache/infographs/elderly/index.html>.
- Friedmann, E., & Gee, N. R. (2018). Critical review of research methods used to consider the impact of human–animal interaction on older adults' health. *The Gerontologist*, *gnx150*, <https://doi.org/10.1093/geront/gnx150>.
- Friedmann, E., Katcher, A. H., Lynch, J. J., & Thomas, S. A. (1980). Animal companions and one-year survival of patients after discharge from a coronary care unit. *Public Health Reports*, 95, 307–312.
- Friedmann, E., Thomas, S. A., Son, H., Chapa, D., & McCune, S. (2013). Pet's presence and owner's blood pressures during the daily lives of pet owners with pre- to mild hypertension. *Anthrozoös*, 26, 535–550.
- Garity, T. F., Stallones, L. F., Marx, M. B., & Johnson, T. P. (1998). Pet ownership and attachment as supportive factors in the health of the elderly. *Anthrozoös*, 3, 35–44.
- Gee, N. R., Mueller, M. K., & Curl, A. L. (2017). Human–animal interaction and older adults: An overview. *Frontiers in Psychology*, 8, 1416. <https://doi.org/10.3389/fpsyg.2017.01416>.
- González Ramírez, M. T., & Landero Hernández, R. (2014). Benefits of dog ownership: Comparative study of equivalent samples. *Journal of Veterinary Behavior: Clinical Applications and Research*, 9, 311–315.
- Häberli, F. (2018). Tiere in Alters- und Pflegeheimen. Ergebnisse einer schweizweiten Umfrage. Basel: Schweizer Tierschutz. Retrieved from http://www.tierschutz.com/grizzly/umfrage/pdf/umfrage_grizzly.pdf.
- Holt-Lunstad, J., Smith, T. B., Baker, M., Harris, T., & Stephenson, D. (2015). Loneliness and social isolation as risk factors for mortality: A meta-analytic review. *Perspectives on Psychological Science*, 10, 227–237.
- Hunt, M., Al-Awadi, H., & Johnson, M. (2008). Psychological sequelae of pet loss following Hurricane Katrina. *Anthrozoös*, 21, 109–121.
- Karefjord, A., & Nordgren, L. (2018). Effects of dog-assisted intervention on quality of life in nursing home residents with dementia. *Scandinavian Journal of Occupational Therapy*, 1–8. doi:10.1080/11038128.2018.1467486.
- Knight, S., & Edwards, V. (2008). In the company of wolves. *Journal of Aging and Health*, 20, 437–455.
- Le Roux, M. C., & Kemp, R. (2009). Effect of a companion dog on depression and anxiety levels of elderly residents in a long-term care facility. *Psychogeriatrics*, 9, 23–26.
- Levine, G. N., Allen, K., Braun, L.-T., Christian, H. E., Friedmann, E., Taubert, K. A., ... Lange, R. A. (2013). Pet ownership and cardiovascular risk: A scientific statement from the American Heart Association. *Circulation*, 127, 2353–2363.
- Lockwood, R. (2002). Making the connection between animal cruelty and abuse and neglect of vulnerable adults. *The Latham Letter*, 23, 10–11.
- Mayor's Alliance for NYC's Animals. (2015). Helping pets and people in crisis. Hospitalization and illness and pets. Retrieved from <http://www.helpingpetsandpeoplenyc.org/hospitalization-and-illness-and-pets>.

- McCall, W. V., & Kintzinger, K. W. (2013). Late life depression: A global problem with few resources. *Psychiatric Clinics of North America*, *36*, 475–481.
- McNicholas, J. (2014). The role of pets in the lives of older people: A review. *Working with Older People*, *18*, 128–133.
- McNicholas, J., & Collis, G. M. (2000). Dogs as catalysts for social interactions: Robustness of the effect. *British Journal of Psychology*, *91*, 61–70.
- McNicholas, J., Gilbey, A., Rennie, A., Ahmedzai, S., Dono, J., & Ormerod, E. (2005). Pet ownership and human health: A brief review of evidence and issues. *British Medical Journal*, *331*, 1252–1254.
- Mubanga, M., Byberg, L., Nowak, C., Egenvall, A., Magnusson, P. K., Ingelsson, E., & Fall, T. (2017). Dog ownership and the risk of cardiovascular disease and death: A nationwide cohort study. *Scientific Reports*, *7*, 15821. doi:10.1038/s41598-017-16118-6.
- Mueller, M. K., Gee, N. R., & Bures, R. M. (2018). Human–animal interaction as a social determinant of health: Descriptive findings from the health and retirement study. *BMC Public Health*, *18*, 305.
- Nordgren, L., & Engström, G. (2014). Effects of dog-assisted intervention on behavioural and psychological symptoms of dementia. *Nursing Older People*, *26*, 31–38.
- Olsen, C., Pedersen, I., Bergland, A., Enders-Slegers, M. J., & Ihlebæk, C. (2016). Effect of animal-assisted activity on balance and quality of life in home-dwelling persons with dementia. *Geriatric Nursing*, *37*, 1–8.
- Olsen, C., Pedersen, I., Bergland, A., Enders-Slegers, M.-J., Patil, G., & Ihlebæk, C. (2016). 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. *International Journal of Geriatric Psychiatry*, *31*, 1312–1321.
- Ortman, J. M., Velkoff, V. a., & Hogan, H. (2014). An aging nation: The older population in the United States. Economics and Statistics Administration, US Department of Commerce. Retrieved from <https://www.census.gov/content/dam/Census/library/publications/2014/demo/p25-1140.pdf>.
- Parslow, R. A., Jorm, A. F., Christensen, H., Rodgers, B., & Jacomb, P. (2005). Pet ownership and health in older adults: Findings from a survey of 2,551 community-based Australians aged 60–64. *Gerontology*, *51*, 40–47.
- Perissinotto, C. M., Stijacic Cenzer, I., & Covinsky, K. E. (2012). Loneliness in older persons: A predictor of functional decline and death. *Archives of Internal Medicine*, *172*, 1078–1083.
- Pitteri, E., Mongillo, P., Adamelli, S., Bonichini, S., & Marinelli, L. (2014). The quality of life of pet dogs owned by elderly people depends on the living context, not on the owner's age. *Journal of Veterinary Behaviour*, *9*, 72–77.
- Rogers, J., Hart, L. A., & Boltz, R. P. (1993). The role of pet dogs in casual conversations of elderly adults. *Journal of Social Psychology*, *133*, 265–277.
- Rosenkoetter, M. M. (1991). Health promotion: The influence of pets on life patterns in the home. *Holistic Nursing Practice*, *5*, 42–51.
- Rotolo, C. (n.d.). Aging parents can no longer care for their pets. Retrieved from <https://www.agingcare.com/articles/parents-can-no-longer-care-for-pets-151682.htm>.
- Ryan, S., & Ziebland, S. (2015). On interviewing people with pets: Reflections from qualitative research on people with long-term conditions. *Sociology of Health and Illness*, *37*, 67–80.
- 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*, 647–653.
- Siegel, J. M. (1990). Stressful life events and use of physician services among the elderly: The moderating role of pet ownership. *Journal of Personality and Social Psychology*, *58*, 1081–1086.
- Smith, D. W., Seibert, C. S., Jackson 3rd, F. W., & Snell, J. (1992). Pet ownership by elderly people: Two new issues. *International Journal of Aging & Human Development*, *34*, 175–184.
- Souter, M. A., & Miller, M. D. (2007). Do animal-assisted activities effectively treat depression: A meta-analysis. *Anthrozoös*, *20*, 167–180.
- Stanley, I. H., Conwell, Y., Bowen, C., & Van Orden, K. A. (2013). Pet ownership may attenuate loneliness among older adult primary care patients who live alone. *Aging & Mental Health*, *18*, 394–399.
- Stevens, J. A., Teh, S. L., & Haileyesus, T. (2010). Dogs and cats as environmental fall hazards. *Journal of Safety Research*, *41*, 69–73.
- Stevenson, S. (2017). Are you putting off a move to assisted living? Retrieved from <https://www.aplaceformom.com/blog/5-6-15-reasons-families-delay-moving/>.
- Thorpe, R. J., Simonsick, E. M., Brach, J. S., Ayonayon, H., Satterfield, S., Harris, T. B., & Kritchevsky, S. B. (2006). Dog ownership, walking behavior, and maintained mobility in late life. *Journal of the American Geriatrics Society*, *54*, 1419–1429.

- Walsh, F. (2009). Human–animal bonds II: The role of pets in family systems and family therapy. *Family Process*, 48, 481–499.
- WHO. (2002). Active ageing: A policy framework. Retrieved from http://apps.who.int/iris/bitstream/handle/10665/67215/WHO_NMH_NPH_02.8.pdf;jsessionid=841DC20F167368776B85F5A951663B54?sequence=1.
- WHO. (2015). *World report on ageing and health*. Luxembourg: World Health Organizations.
- Willmott, H., Greenheld, N., & Goddard, R. (2012). Beware of the dog? An observational study of dog-related musculoskeletal injury in the UK. *Accident Analysis & Prevention*, 46, 52–54.
- Wood, L. J., Giles-Corti, B., Bulsara, M. K., & Bosch, D. A. (2007). More than a furry companion: The ripple effect of companion animals on neighborhood interactions and sense of community. *Society & Animals*, 15, 43–56.
- Wood, L., Martin, K., Christian, H., Nathan, A., Lauritsen, C., Houghton, S., ... McCune, S. (2015). The pet factor: Companion animals as a conduit for getting to know people, friendship formation and social support. *PLoS ONE*, 10(4), e0122085.