

[Comment on section](#)

- [Introduction](#)
 - [One Key Paper to Read](#)
 - [What are the benefits to owning a pet?](#)
 - [Psychological Benefits](#)
 - [Physical Benefits](#)
 - [Do different animals have different effects?](#)
 - [What are the practical applications?](#)
 - [Is there a downside to owning an animal?](#)
 - [Wild claims](#)
 - [And the verdict is...](#)
 - [Recommended Reading](#)
 - [References](#)
-
-

Introduction

[Comment on section](#)

Humans have kept animals for thousands of years, often with practical purpose and associated benefits such as the use of dogs for hunting or, as in the case of cats in Ancient Egypt, for religious reasons. Pet ownership has remained a part of our culture, and most surveys suggest around half (or more) of households in the UK, US, Europe and Australia own a pet of some kind and that the pet is often a valued member of the household (Beck & Meyers, 1996). Although the reasons for keeping pets may have changed with time, there is a growing body of evidence to suggest that owning a pet may have certain physical and psychological benefits for the owner.

This theory is by no means new, in the 18th century a British asylum for people with severe mental conditions kept rabbits, seagulls, hawks and poultry because they believed that patients gained health benefits from being around animals (Wells, 2011). More recently, empirical research has begun to look at whether such effects actually exist and, despite methodological problems which cloud the exact relationship and mechanisms, results so far suggest that a relationship between pet ownership and physical and psychological well-being does exist. This review aims to look at recent research in this field to discover what these benefits might be.

So...does having a pet really improve your well-being?

[- Back to contents.](#)

One Key Paper to Read

[Comment on section](#)

[**Wells, D. L. \(2009\) The Effects of Animals on Human Health and Well-being
Journal of Social Issues 65:523-543**](#)

[Comment on section](#)

This paper is a review of the research into what effects of pet-ownership may exist on short- and long-term physical health, as well as the associations found between animals and psychological well-being and the mechanisms for how these benefits may come about.

Among the areas looked at are the effects of animals on stress reduction and blood pressure, prevention of certain diseases, recovery from illness, self esteem, social companionship, and depression. Animals as an aid for the disabled and "therapist" for the institutionalised are also discussed, as are the suspected abilities of certain animals to detect and aid with the treatment of specific diseases. The author then goes on to look at how animals might bring about such effects and the possible different benefits of different animals. The paper acknowledges that the evidence is not yet conclusive for a direct causal link between having animal companions and human well-being as well as discussing various methodological issues in the research. It also factors in the possible negatives of pet ownership such as transmission of diseases and bereavement, but overall emphasises that the theory of pets as beneficial to their owners well-being is largely supported by the literature, and provides an excellent starting point for those interested in this topic.

What are the benefits of owning a pet?

[Comment on section](#)

Psychological Benefits

[Comment on section](#)

In general, research supports our notion that owning pets is beneficial to our mental well-being. Studies report pet owners have lower levels of anxiety, depression and loneliness. Pets can improve our feelings of autonomy, competence, and self-esteem. They can also “buffer” the effects of stressful life events, like bereavement or divorce (Wells, 2009). There are few studies looking at the effects of pet ownership in the general population. The majority of research focuses on older people or those with certain conditions and disabilities.

General Population

An Australian survey of 92 cat owners found that they had a lower level of psychiatric disturbance and a more favourable attitude toward pets than non-pet owners (Straede & Gates, 1993). Serpell (1990) followed individuals for a 10 month period after they acquired a pet dog or cat. Participants showed improvements in psychological well-being over the first six months but only dog owners sustained them at 10 months. Dog owners reported enhanced self-esteem and feelings of security.

Older People

Research by Siegel (1990) into the effect of pets on older people showed that pet-owners had fewer doctor contacts, supposedly because the pets satisfied their need for companionship. Additionally, their doctor visits did not increase during times of increased life stress because the pets functioned as stress buffer. A third of respondents described “companionship” as a benefit of owning a pet animal, among feelings of security (25%) and feeling loved (21%). Other studies have shown that pet ownership and attachment is associated with less depression in bereaved elderly people with low social support (Garrity et al, 1989; Akiyama et al., 1986). An Alzheimer’s-specific study reported that those still living at home with their pet had fewer mood disorders

Happiness can be
measured with cats.
(CATS = HAPPINESS)



and episodes of aggression and anxiety (Fritz et al, 1995).

AIDS/HIV Population

In a qualitative study by Carmack (1991) patients with AIDS/HIV described the relationship with their pets as a source of support, affection, nurturance and acceptance. Another important theme that emerged was the perceived ability of the pets to reduce and help manage stress. Comparable to the studies conducted with older participants, patients with AIDS reported less depression when they owned pets and had fewer social confidants (Siegel et al., 1999).

Children

90% of interviewed children between the ages of three and thirteen said that there was some benefit in owning a pet (Kidd & Kidd, 1985). The mentioned benefits included learning opportunities, happiness, comfort, and unconditional love (Poresky, 1996). Parents explanations on why they thought pets benefited their children contained themes like developing empathy, inspiring respect for living beings, and learning to care for others (McCune et al., 2010). The quality of the child-pet relationship seems to be more important than the presence of a pet (Poresky & Hendrix, 1990). There is robust evidence that pets play a role in the psychosocial development of children. Van Houtte & Jarvis (1995) reported higher autonomy in third to sixth graders owning pets. Fifth and sixth graders indicated higher self-esteem. The authors suggest that pets may have a greater impact on children when they enter adolescents. In a study over 800 Croatian children dog owners were more empathic and pro-socially oriented than non-owners (Vidović et al., 1999).

Most studies show that the relationship between pet ownership and psychological health is more complex than for physical health. For example, Raina and colleagues (1999) found no direct association between pet ownership and change in psychological well-being but pet ownership modified the relationship between social support and the change in psychological health. Similarly, Duvall and others (2010) found that neither pet ownership nor attachment to the pet could predict levels of depression or loneliness. However, the combination of low levels of social support and high attachment to pets predicted higher scores on loneliness and depression.

[- Back to contents.](#)

In accordance with Maslow's hierarchy of needs physical wellbeing is also an important factor for personal happiness (Maslow, 1943).

Physical Benefits

[Comment on section](#)

The idea that pets are good for our physical health is by no means a new one. Already in 1880 it was suggested that people with medical problems gained pleasure from the presence of birds. However, an attempt to scientifically examine the effect of animals on human health is a modern phenomenon. In fact, for nearly 25 years, research has shown that pets may provide certain health benefits (Anderson, Reid and Jennings, 1992; Headey, 1999).

Fewer Allergies and Asthma

The old thinking is that if you come from an allergy-prone family, pets should be avoided. However, a

growing number of studies suggest that children growing up in a home with animals (cats, dogs or farm animals) have less risk of allergies and asthma. In a recent study, University of Wisconsin-Madison pediatrician James Gern (2004) analysed the blood of 101 babies immediately after birth and one year later for evidence of an allergic reaction and immunity changes. The results revealed that if a dog lived in the home, infants were less likely to show evidence of pet allergies, 19 vs. 33 %. This finding is line with previous research reporting a reduced risk of asthma and allergic rhinitis in children exposed to pet allergens during the first year of life (Ownby et al., 2002; Nafsted et al., 2001).

Immediate/short-term effects

Without a question a pet is a great friend and after a difficult day, pet owners quite literally feel the love. Animals make people feel good but we are talking about more than feeling glad they are around. Previous research has shown that the presence of a dog in a room has several short-term health benefits such as decreases in blood pressure/heart rate as a response to stressful situations and tasks such as a mental arithmetic test (Allen et al., 1991) and reading aloud (Friedmann et al., 1983). It has also been suggested that 15 to 30 minutes of watching fish swim around in an aquarium may lower blood pressure and other autonomic responses to mild stress as the level of cortisol, a hormone associated with stress, is lowered and the production of serotonin, a chemical associated with well-being, is increased (De Schriver and Riddick, 1991).



Healthy Heart

It has been found that seniors who own dogs go to the doctor less than those who do not. In a study of 100 Medicare patients, even the most highly stressed dog owners had 21% fewer physician contacts than non-dog owners (Siegel, 1990).

Evidence for pet ownership and reduced cardiovascular disease comes from a study conducted by Anderson and colleagues (1992) who compared risk factors for cardiovascular disease in pet owners and non-owners. The results of the study revealed that pet owners had significantly lower blood pressure and lower risk of developing coronary heart disease than non-owners and this was not explicable on the basis of cigarette smoking, diet, body mass index or socioeconomic profile.

Friedmann and her colleagues (1980) reported that those who have experienced a heart attack, patients with a dog or cat tend to have better recovery rates. They examined the association between pet ownership and survival after a heart attack and reported that total of 58 percent of the 1-year survivors had one or more pets. Thus the authors suggested that in addition to the therapeutic uses of pets for patients with mental illness, patients with coronary heart disease should be also included in this consideration. The methods used in Friedmann's study were criticised (Wright and Moore, 1982) but it has since been replicated on a larger scale and findings seems fairly well established (Friedmann, 1995).

Long-term Benefits

Serpel (1991) conducted a 10-month study which examined changes in health status in 71 adults following the acquisition of a cat or dog. It was found that both pet-owning groups reported a highly significant reduction in minor health problems (such as coughs, headaches, dizziness and hay fever) during the first month following the pet acquisition and the effect was sustained in dog owners, not in cat owners, through 10 months. Similarly, another study found that elderly people who had pets declined less in physical health in a one year period than a control group without pets (Raina et al., 1998).

Mechanisms through which pets bring benefits

It has been suggested that the mechanisms by which pet ownership may provide health benefits may be related to decreased sympathetic system arousal (Friedmann, 1990). Additionally, it has been noted that light to moderate walking may provide some of the same health benefits as more vigorous types of physical health and that pets may be helpful in providing an impetus for establishing a regular walking program (Siegel et al., 1995). This suggestion was confirmed by Reeves and colleagues (2011) who reported (unsurprising) results that walking a dog increases the overall level of weekly walking. Furthermore, dog walkers were more physically active overall and were more likely to meet the recommended levels of weekly physical activity than those who did not own a dog.



However, individual differences must be taken into account when considering possible underlying mechanisms through which pets may bring benefits. Shy, lonely and older people are most likely to gain from companionship whereas stressed and busy people may relax and their blood pressure and autonomic responses come down. People with very little or irregular physical exercise may exercise more if they own a dog. These all are potential mechanisms underlying the physical benefits of owning a pet and thus worth continued investigation.

Without a doubt the above studies have their limitations and several studies have found no relationship between ownership and health. However, as discussed above, research dating from the 1980s have shown several benefits ranging from

- Reduced risk of asthma and allergic rhinitis (Ownby et al., 2002; Nafsted et al., 2002)
- Reduction in the frequency of minor physical ailments (Serpell, 1991)
- Significantly lower use of general practitioner services (Headey, 1998)
- Reduced risk of cardiovascular disease (Anderson et al., 1992)
- Higher survival rates from myocardial infarction (Friedmann, 1980)
- Better physical health in older people
- Greater physical activity and less obesity (Reeves et al., 2011)

Thus it is clear that these encouraging results give a reason to further investigate potential physical benefits of pets in the future.

[- Back to contents.](#)

Do different animals have different effects?

[Comment on section](#)

There is evidence however that the benefits conferred by pet ownership are not necessarily the same for different types of animals. Unfortunately it is difficult to reach an absolute conclusion due to variation in the amount of research into different animals.

Dogs

Dogs are one of the most commonly owned pets and appear to be by far the most frequently researched animals, with results reliably suggesting that ownership of a dog can induce the physical, psychological and social benefits described above through various mechanisms. There is evidence however that these benefits may also vary depending on the type of dog. The beneficial socialising effects of dog ownership for example have been shown to be fairly robust, applying also to dogs for the disabled (Wells, 2007) and even in spite of the appearance of the person (McNicholas & Collis, 2000). However the appearance of

the dog can have an effect, Wells (2004) found that young dogs and dogs renowned for their good temperament such as Labradors had a better socialising effect than dogs such as Rottweilers.

Cats

Evidence specifically looking at the benefits of owning a cat has yielded more mixed results than for dogs and research is much less extensive despite them also being very common household pets. For example, in a further study into the effects of pet ownership on survival rates after a heart attack Friedmann & Thomas (1995) looked at cats as well as dogs. In contrast to the findings with dogs, it was found that cat owners were actually less likely to be alive after a year. The outlook is not entirely bleak however, Serpall et al. (1991) and Heady (1999) also looked at cats instead of dogs and found that, like dogs, acquiring a cat was associated with a reduced number of minor health problems, however Serpall et al. who looked at the period immediately after acquiring the animals found that, unlike with dogs these effects were not maintained past one month. Studies looking at the loneliness and companionship effects of pet ownership have also found significant results for cats (Zasloff & Kidd, 1994).

Other Animals

There is very little research investigating the specific effects of owning animals other than dogs and cats. Hunt et al. (1992) however looked at whether animals other than dogs and cats might have the same socialising benefits for their owners. Results demonstrated that a person with a rabbit or turtle were also more likely to have interactions with strangers than a person sitting alone with particular effect for rabbits. However it must be remembered that even though these effects have been demonstrated in other animals, dogs are far more likely to be taken out in public than other animals. There is also evidence that fish can have a calming and relaxing effect and help reduce autonomic responses to stress (Katcher et al 1984). Similar effects have been found in birds and even, in one case study, snakes (Eddy, 1996). Companionship and therapy benefits have also been demonstrated in birds and horses (Wood et al. 2005), see 'practical applications' section below for further information relevant to therapy and horses.

Much more research would be required to fully ascertain whether different animals have significantly different effects but results so far suggest that this may be an area worth investigating. It has been suggested however that simply owning any pet can have certain advantages such as socialisation effects for children, helping them to learn empathy and how to care for others. Wells (2005) also suggests that the benefit of stress reduction may not in fact require a live animal at all. In this study videos of fish, primates and birds were found to reduce stress compared to a blank screen or videos of people.

[- Back to contents.](#)

What are the practical applications?

[Comment on section](#)

So far a number of benefits of owning a pet have been pointed out. Since animals seem to be so beneficial to humans, are there any practical applications to using animals in a clinical setting for example?

Animals have been companions for humans for centuries and have been used as early as 1792 as a form of therapy. Florence Nightingale was said to be an advocate of pets referring particularly to the benefits of birds for invalids. (Hooker et al., 2002) The use of animals in therapy is usually referred to as pet-assisted therapy and can use a variety of animals dependent on the intended recipients and nature of the pet.

Pet Assisted Therapy

The most common animals used in pet-assisted therapy are dogs, however, cats, rabbits and other small furries have also been used within a therapy context. Pet-assisted therapy originally began in the 1960s after Boris Levinson noticed that his patients responded more positively in therapy in the presence of his dog (Levinson 1962). Extensive use of animals in a therapeutic setting only began in the 1990's with Dr Thomas who recognised the potential of using animals therapeutically and therefore sparked a tirade of research supporting the benefits of animals (Hooker et al., 2002).

Animals have been used in a variety of settings to help with a variety of problems. In hospital settings, pets can provide a distraction for painful procedures in young children and reduce stress (Kaminski et al., 2002) and blood pressure in other patients. There has also been positive effects reported in hospice settings with older patients and in psychiatric wards with hospital staff and relatives reporting the patients to be calmer and therefore having improved relations (Hooker et al., 2002).

More unusual settings that have shown to benefit from the presence of a pet are classrooms. One study showed that a class who had a dog present were overall calmer and more focused on their learning (Kortshal & Ortbauer, 2003), which perhaps helps explain why many American schools are so keen to have "class pets". As well as in education, individuals in the prison system and juvenile offender's units have shown to benefit from having an animal present with reported increases in mental well-being and greater potential for rehabilitation (Merriam-Ardunini, 2000).

Overall, meta-analysis by Nimer and Lundahl (2007) found a moderate effect of intervention, reporting improvements in behavioural problems, medical difficulties and emotional dysfunction. A further meta-analysis by Giaquinto and Valentini (2009) reported consistent evidence of a protective cardiovascular effect by owning a dog. However, they also found the evidence regarding emotional benefits to be inconsistent.

Horses in Therapy

Another therapy worth highlighting is that of using horses within a therapeutic setting. Hippotherapy is the use of horses to give physical therapy to children and adults who have problems with movement. The movement of the horse mimics that of walking and therefore provides rehabilitation for the muscle groups within the affected child or adult (Snider et al., 2007).

Additionally, horse riding also benefits children in terms of self-esteem and emotional connections. Learning to ride and care for a horse has been shown to have positive effects on children with varying mental and physical disorders as well as young offenders (Snider et al., 2007).

Practical Exercise

If you would like to experience the benefits of animals but don't have the space, expense or the tolerance for fluff here is a short video of fish to replicate some of the feelings described above in research.



However, personally our group found this video of a chinchilla more soothing.



[- Back to contents.](#)

Is there a downside to owning an animal?

[Comment on section](#)

For those with an interest in the potential drawbacks "**Smith, B. (2012). The 'pet effect'- Health related aspects of companion animal ownership. *Australian Family Physician*, 41, 439-42.**" is a good place to

start. It covers various potential negatives including allergies, diseases and the costs involved. Also, see [below](#) for some "wild claims" about the downsides to pet ownership.



- also poop scooping.

Wild claims, and when the theory doesn't match up with the evidence!

[Comment on section](#)

Overall, it is theorised that keeping pets is beneficial for health and well-being. However, it is important to bear in mind that theory is not always based on extensive and appropriate empirical testing. Here, some of the issues surrounding the discussion of the benefits and potential costs of owning a pet in the media and so in the public eye, as well as in scientific literature are discussed.

Following is a selection of claims made about the pros and cons of owning a pet in a well-known tabloid newspaper:

[Owning a chinchilla makes you brainy.](#)

[Ferrets prevent suicide.](#)

[Owning a pet makes you live longer.](#)

[Taking your pet to bed will give you the bubonic plague.](#)

[Taking your pet to bed will give you MRSA.](#)

[You might as well replace your therapist with a dog!](#)

[And while you're at it - your entire medicine cabinet.](#)

[Dirty pets prevent colds.](#)

[Pets are responsible for asthma.](#)

[Pets are weapons – criminals have pets.](#)

[Having a fat dog that looks like you will halve your body weight.](#)

It doesn't take much probing to discover just how wild some of these wild claims are. In the first article on Chinchilla ownership and intelligence, the study quoted is not referenced and attempts to find such a study published anywhere remain futile. Furthermore, the study is commissioned by Pets at Home, who may or may not have had an abundance of chinchillas to shift from their shelves. The conclusion that pet owners are more intelligent is based on children reporting that they feel smarter, and that owning a pet has benefits with regards to homework. One such benefit could include blaming the creatures eating habits on a lack of said homework.

When taking into account the many vested interests on the part of both the producers and the participants, it is sensible to view the article with scepticism. Also, assessing intelligence by questioning how intelligent participants feel is clearly not the most accurate of methods. However, instead of predicting the IQ as claimed, results such as these could be demonstrative of the positive effects of pets to individuals' well-being – feeling more intelligent could be indicative of improved self-esteem. Despite a general feeling within the literature that self-esteem and pet ownership are related, the empirical evidence is surprisingly sparse. For example, Martine and Kidd (1980) report that giving children pets leads to an increased self-esteem, but scrutiny of the report evidenced and the studies cited within it actually paint a different picture. Similarly, Johnson and Rule (1991) confidently talk of previous research indicating that individuals with pets have a higher self-esteem but cite spurious “evidence” such as a theoretical paper by Levinson (1972), in which the “benefits” of sexual relations with animals are also discussed. Johnson and Rule then went on to contradict these assertions with their own findings, that pet owners and non-owners did not differ on a number of personality dimensions including self-esteem. It seems that discussion on self-esteem is an area in which the theory and empirical evidence do not necessarily match up.

What about the negatives?

Of course, benefits to mental well-being and physical health become less interesting when they could be outweighed by negative effects such as spreading the bubonic plague. In the 14th century the Bubonic plague killed 70-80% of people in some cities and villages in England (Alchon, 2003). Were pets to pose a serious risk of spreading such an infection, small improvements to personal well-being would wane in importance by comparison. This article is based on a review of literature on zoonoses from the PubMed database (Chomel & Sun, 2011). Probably the most compelling evidence for the claim that sleeping with pets carries a risk of bubonic plague comes from a study in which 44% of plague survivors compared to 10% of controls reported sleeping in the same bed as their pet dog. Sleeping with a pet was significantly associated with infection (Gould et al., 2008). All of the other studies reporting the link were based on single cases.

The general consensus within scientific literature is that the benefits far outweigh the possible negative effects. Furthermore, in contrast to that which has been promoted by the media, pets are generally considered to be associated with less risk of asthma. So what does the evidence say? Some studies have found a reduced risk of asthma (Celedon et al., 2002; Perzanowski et al., 2002) whilst others have found a reduced risk of allergies which has been linked with asthma (Mundhane et al., 2009). However, contradictory literature exists. Kerkhof et al. (2009) found that whilst risks for developing allergies were reduced, incidence of asthma did increase slightly. For more information on the association between pets and allergies and asthma, see [here](#). Further research is needed before definitive conclusions can be drawn either way.

So should we love pets?

Each area of research mentioned above could be subject to such scrutiny and the majority throw up conflicting results in differing studies. However, it seems unlikely that the research will produce conclusions which lead Britain to become a nation of pet-haters - many pet-owners will not need science

to convince them that their pets enhance their lives. Future studies should focus on the usefulness of animal therapies which are often utilised without much experimental evidence pointing to their effectiveness (see [here](#)).

[- Back to contents.](#)

And the verdict is...

[Comment on section](#)

There is a growing evidence base for the benefits of pet ownership on human well-being. Conflicts still exist within the literature, and some negatives have been reported. In general, it seems the benefits outweigh the risks which have been associated with keeping animals. Further research must be carried out to explore the full effects of animal therapies due to the potential these pose for improving the lives of individuals with a large variety of disabilities, illnesses, social and emotional problems.

[- Back to contents.](#)

Recommended Reading

[Comment on section](#)

- [Friedmann, E & Thomas, SA \(1995\). Pet ownership, social support, and one-year survival after acute myocardial infarction in the Cardiac Arrhythmia Suppression Trial \(CAST\).Am J Cardiol.,15,1213-7.](#)
- [Herzog, H \(2011\). The Impact of Pets on Human Health and Psychological Well-Being : Fact, Fiction, or Hypothesis? Current Directions in Psychological Science, 236-239](#)
- [Serpell, JA \(1990\). Evidence for long term effects of pet ownership on human health. Reprinted from Pets, Benefits and Practice. Waltham Symposium 20, April 19, 1990, Courtesy of Waltham.](#)

References

[Comment on section](#)

Alchon, S. A. (2003). *A pest in the land: new world epidemics in a global perspective*. USA: University of New Mexico Press.

Akiyama, H., Holtzman, J., & Britz, W. (1986). Petownership and health status during bereavement. *Omega*, 17, 187-193.

Allen, K. M., Blascovich, J., Tomaka, J., & Kelsey, R. M. (1991). Presence of human friends and pet dogs as moderators of autonomic responses to stress in women. *Journal of personality and social psychology*, 61(4), 582.

Anderson, W. P., Reid, C. M., & Jennings, G. L. (1992). Pet ownership and risk factors for cardiovascular disease. *The Medical Journal of Australia*, 157(5), 298.

Beck, A.M. & Meyers, N.M. (1996) Health enhancement and companion animal ownership. *Annual*

- Chomel, B. B. & Sun, B. (2011). Zoonoses in the bedroom. *Emerging Infectious Diseases*, 17, 167-172.
- Carmack, BJ (1991). The role of companion animals for persons with AIDS/HIV. *Holist Nurs Pract.*, 5, 24-31.
- DeSchraver, M. M., & Riddick, C. C. (1990). Effects of watching aquariums on elders' stress. *Anthrozoos: A Multidisciplinary Journal of The Interactions of People & Animals*, 4(1), 44-48.
- Duvall, A., Nikolina, M., & Pychyl, TA (2010). An Examination of the Potential Role of Pet Ownership, Human Social Support and Pet Attachment in the Psychological Health of Individuals Living Alone. *Anthrozoos*, 23, 37-54.
- Eddy, T.J. (1996) RM & Beaux: reductions in cardiac activity in response to a pet snake. *Journal of Nervous Mental Disease*. Vol. 184;No. 9. Pp. 573-575.
- 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(4), 307.
- Friedmann, E., Katcher, A.H., Thomas, S.A., & Lynch, J.J. (1983). Social interaction and blood pressure. *Journal of Nervous and Mental Disease*, 171, 461-465
- Friedmann, E., Katcher, A., Lynch, J., & Thomas, S. (1990) Animal companions and one-year survival of patients after discharge from a coronary care unit. *Public Health Reports*, 15, 307-312.
- Friedmann, E. & Thomas, S.A. (1995) Pet ownership, social support, and one-year survival after acute myocardial infarction in the Cardiac Arrhythmia Suppression Trial (CAST). *American Journal of Cardiology*. Vol.76;No.17, 1213-1217.
- Fritz, C.L., Farver, T.B., Kass, P.H., Hart, L.A.(1995). Association with companion animals and the expression of noncognitive symptoms in Alzheimer's patients. *J Nerv and Ment Disease*, 183, 459-463.
- Garrity, TF, Stallones, L, Marx, MB, & Johnson, TP(1989). Pet Ownership And Attachment As Supportive Factors In The Health Of The Elderly. *Anthrozoos*, 3, 35-44.
- Gern, J. E., Reardon, C. L., Hoffjan, S., Nicolae, D., Li, Z., Roberg, K. A., & Lemanske, R. F. (2004). Effects of dog ownership and genotype on immune development and atopy in infancy. *Journal of allergy and clinical immunology*, 113(2), 307-314.
- Giaquinto, S & Valentini, F. (2009) Is there a Scientific basis for pet therapy? *Disability and Rehabilitation* 31(7): 595-598
- Gould, L. H., Pape, J., Ettestad, P., Griffith, K. S. & Mead, P. S. (2008). Dog-associated risk factors for human plague. *Zoonoses Public Health*, 55, 448-454.
- Headey, B.W. (1999). Health benefits and health cost savings due to pets: preliminary estimates from an Australian national survey. *Social Indicators Research*, 47, 233-43.
- Hooker, S. D., Holbrook Freeman, L. H., & Stewart, P. (2002) Pet Therapy Research: A historic view. *Holistic Nursing Practice*. 17(1):17-23
- Hunt, S.J., Hart, L.A., & Gomulkiewicz, R. (1992) Role of Small animals in social interactions between strangers. *Journal of Social Psychology*. Vol. 132;No.2 Pp. 245-256.
- Johnson, S. B., & Rule, W. R. (1991). Personality characteristics and self-esteem in pet owners and non-

owners. *International Journal of Psychology*, 26, 241-252.

Kalminski, M., Pellino, T., & Wish, J. (2002) Play and Pets: The Physical and Emotional Impact of Child-Life and Pet Therapy on Hospitalized Children. *Children's Health Care*. 31(4): 321-335

Katcher, A., Segal, H., & Beck, A. (1984) Comparison of contemplation and hypnosis for reduction of anxiety and discomfort during dental surgery. *American journal of clinical hypnosis*. Vol.27;Issue 1. p.14-21

Kidd, AH & Kidd, RM (1985). Children's attitudes toward their pets. *Psychological Reports*, 57, 15-31.

Kotrshal, K. & Ortbauer, B. (2006) Behavioural effects of the presence of a dog in the classroom. *Anthrozoos* 16(2): 147-159

Levinson, B. M. (1978). Pets and personality development. *Psychological Reports*, 42, 1031-1038.

Martinez, R. L. & Kidd, A. H. (1980). Two personality characteristics in adult pet-owners and non-owners. *Psychological Reports*, 47, 318-318.

Maslow, A.H. (1943). A theory of human motivation. *Psychological Review*, 50, 370-96.

McNicholas, J. & Collis, G.M. (2000) Dogs as catalysts for social interaction: Robustness of the effect. *British Journal of Psychology*, 91, 61-70.

McCune, S, McCardle, P, Griffin, JA, Maholmes, V(2010). *How Animals Affect Us: Examining the Influence of Human-Animal Interaction on Child Development and Human Health*. American Psychological Association.

Merriam-Arduini, S. (2000). Evaluation of an experimental program designed to have a positive effect on adjudicated violent, incarcerated male juveniles age 12–25 in the state of Oregon. *Unpublished doctoral dissertation, Pepperdine University*

Nafsted, P., Magnus, P., Gaager, & Jaakola, J.2001. Exposure to pets and atopy-related disease in the first 1 years of life. *Allergy* 157:298-301.

Nimer, J. & Lundahl, B. (2007) Animal-Assisted therapy: A meta analysis. *Anthrozoos: A Multidisciplinary Journal of The Interactions of People & Animals*. 20(3): 225-238

Ownby, D. R., Johnson, C. C., & Peterson, E. L. (2002). Exposure to dogs and cats in the first year of life and risk of allergic sensitization at 6 to 7 years of age. *JAMA: the journal of the American Medical Association*, 288(8), 963-972.

Poresky, RH (1996). Companion animals and other factors affecting young children's development. *Anthrozoos*, 9, 159–68.

Poresky, RH & Hendrix, C (1990). Differential Effects of Pet Presence and Pet-Bonding on young Children. *Psychological Reports*, 67, 51-54.

Raina, P., Bonnett, B., & Waltner-Toews, D. (1998). Relationship between pet ownership and health care use among seniors. In *8th Conference of the International Association of Human-Animal Interaction Organisations, Prague, Sept* (pp. 10-11).

Raina P, Waltner-Toews D, Bonnett B, Woodward C, Abernathy T.(1999). *Influence of companion animals on the physical and psychological health of older people: an analysis of a one-year longitudinal study*. *J Am Geriatr Soc*, 47, 323-9.

Serpell, J.A. (1990). Evidence for long term effects of pet ownership on human health. *Pets, Benefits and Practice*, Waltham Symposium 20, April 19, 1990.

Serpell, J.A. (1991). Beneficial aspects of pet ownership on some aspects of human health and behaviour. *Journal of the Royal Society of Medicine*, 84, 717-20.

Siegel, JM. Stressful life events and use of physician services among the elderly: the moderating role of pet ownership. *J Pers Soc Psychol* 1990; 58: 1081-6.

Siegel JM, Angulo FJ, Detels R, Wesch J, Mullen A. AIDS diagnosis and depression in the Multicenter AIDS Cohort Study: the ameliorating impact of pet ownership. *AIDS Care*. 1999 Apr;11(2):157-70.

Smith, B. (2012). The 'pet effect'- Health related aspects of companion animal ownership. *Australian Family Physician*, 41, 439-442.

Snider, L., Korner-Bitensky, N., Kammann, C., Warner, S., & Saleh, M. (2007) Horseback Riding as Therapy for Children with Cerebral Palsy: Is There Evidence of Its Effectiveness? *Physical & Occupational Therapy in Pediatrics*, Vol. 27(2): 5-23

Straede, C., Gates, G. (1993). Psychological Health in a Population of Australian Cat Owners. *Anthrozoos* 6:30-41.

Vidović, VV, Štetić, VV, & Bratko, D (1990). Pet Ownership, Type of Pet and Socio-Emotional Development of School Children. *Anthrozoos*, 12, 211-217.

Wells, D.L. (2004) The facilitation of social interactions by domestic dogs. *Anthrozoos: A Multidisciplinary Journal of the Interactions of People and Animals*. Vol.17;No.2, 340-352.

Wells, D.L. (2005) The effect of videotapes of animals on cardiovascular responses to stress. *Stress & Health*. Vol.21, 209-213.

Wells, D.L. (2007) Domestic dogs and human health: an overview. *British Journal of Health Psychology*. Vol.12, 146-156.

Wells, DL (2009). The effects of animals on human health and well-being. *Journal of Social Issues*, 65, 523-543.

Wells, D.L. (2011) The value of pets for human health. *The Psychologist*. 24;3 172-176

Wood, L., Giles-Corti, B., Bulsara, M. (2005) The pet connection: Pets as a conduit for social capital. *Social Science and Medicine*. Vol.61. 1159-1173.

Zasloff, R.L. & Kidd, A.H. (1994) Loneliness and pet ownership among single women. *Psychological Reports*. 75;2 747-752.