



Domestic dogs and human health: An overview

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Purpose. The domestic dog is one of the most commonly owned, and widely utilized, animals in today's society. This paper provides an overview of research that has explored the relationship between the domestic dog and human well-being.

Methods. The article initially concentrates on the value of dogs for physical health in humans, exploring the evidence that this species can prevent us from becoming ill, facilitate our recovery from ill-health, and even serve as an early warning system for certain types of underlying ailment including cancer, oncoming seizures and hypoglycaemia. The paper then examines the relationship between dogs and psychological health in humans, exploring the ability of this species to aid the disabled and serve as a therapist to those in institutional settings such as hospitals, residential homes and prisons. Weaknesses in the existing research in this area are highlighted throughout the article.

Conclusions. Taken together, the studies reviewed suggest that dogs can have prophylactic and therapeutic value for people.

Recent years have witnessed a surge of interest in the relationship between companion animals and human health (see Friedmann, Thomas, & Eddy, 2000; Hart, 2000; Wilson & Turner, 1998, for reviews). While a wide variety of species (e.g. cats, rabbits, birds) have been shown to offer therapeutic value to humans, the domestic dog has been employed considerably more in experimental and applied settings than any other animal. Despite this, most articles in this area have focused on the relationship between human health and pets as a generic group, rather than concentrating specifically on the dog alone.

This paper provides an overview of research that has explored the relationship between the domestic dog and human well-being. The article examines the value of dogs for both physical and psychological human health, focusing on new advancements in the area, including, for example, the role of dogs as early warning systems for human disease and as therapists for people in institutions such as prisons.

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Dogs and physical health

The notion that ‘pets are good for us’ is by no means a new one, but it is only relatively recently that any scientific attention has been devoted to the relationship between companion animals and physical well-being in humans. While not without its methodological weaknesses or criticisms, this research has shown that the domestic dog may be able to *prevent* us becoming ill, *facilitate* our recovery from ill-health and *predict* certain types of underlying ailment.

Dogs as preventers of ill-health

A small number of studies have explored the relationship between pet ownership and general physical well-being in a bid to determine whether companion animals can prevent ill-health. This work tends to suggest that pet owners, as a group, are a healthier cohort of individuals than non-owners (see, e.g. Wilson & Turner, 1998). Dogs may be particularly valuable as preventers of ill-health. Serpell (1991), for example, followed up dog and cat owners for 10 months following the acquisition of their pet from an animal rescue shelter. Significant reductions in the frequency of minor physical ailments (e.g. headaches, colds, hay fever, dizziness) were noted for both types of pet owner 1 month following their animals’ acquisition. Dog owners maintained this decrease in health problems 10 months later; cat owners, by contrast, did not.

While Serpell explored relatively minor physical ailments, other researchers suggest that dogs may be able to prevent more serious medical problems, such as coronary heart disease. For instance, Anderson and colleagues (1992) interviewed 5,741 people attending a screening clinic for coronary heart disease in Melbourne and discovered that the risk factors for this disease were significantly lower for dog (and other pet) owners than those who did not own a companion animal, particularly for males. More recently, Dembicki and Anderson (1996) found lower levels of serum triglycerides (high levels of which are associated with increased risk for heart attacks, e.g. Stavenow & Kjellstrom, 1999) in senior citizens who owned a dog or other type of pet.

Dogs as facilitators to recovery from ill-health

Not only may dogs prevent us from becoming ill, they may also facilitate our recovery from certain types of ailment. Most of the research in this area has explored the ability of dogs to facilitate recovery from relatively serious physical problems, specifically coronary heart disease. Interest in this area stemmed from work by Erika Friedmann and colleagues (1980), who reported that dog (and other pet) owners were significantly more likely to still be alive 1 year after a heart attack than non-owners. While this work has been criticized for its statistical methods (Wright & Moore, 1982) and lack of control for other potential risk factors, for example social support, personality type, socio-economic status (see Bergler, 1988), it remains one of the most widely cited studies in the field.

More recently, Friedmann and Thomas (1995) replicated their earlier work and extended it to a larger number of participants with improved measures of cardiovascular physiology and psychosocial status. The study revealed that different species may hold different health advantages, with dogs serving as stronger facilitators to recovery from ill-health than cats. Dog owners were roughly 8.6 times more likely to still be alive 1 year after a heart attack than those who did not own a dog. Cat ownership, by contrast, was

not only unrelated to survival rate, but cat owners were actually more likely to have died in the 1 year following their heart attack than non-owners.

The question remains as to how dogs might be able to protect their owners from ill-health or, for that matter, facilitate recovery from something as serious as myocardial infarction. A number of mechanisms may be at play. Dogs may, for example, be able to promote their owners' psychological health (see later), a factor that can contribute significantly to physiological well-being. Dogs may also be able to shield their owners from stress, one of the major risk factors associated with ill-health (e.g. DeLongis *et al.*, 1982; Siegel, 1993; Zarski, 1984). The action of stroking and/or talking to a dog, for example, has repeatedly been shown to cause transient decreases in human blood pressure and heart rate (Baun, Bergstrom, Langston, & Thoma, 1984; Katcher, 1981; Katcher, Friedmann, Beck, & Lynch, 1983; Vormbrock & Grossberg, 1988; Wilson, 1991). Moreover, the mere presence of a dog can help to lower autonomic responses to stressful situations (Allen *et al.*, 2002, 1991; Friedmann, Katcher, Thomas, Lynch, & Messent, 1983; Sebkova, 1977).

It is also possible that dogs may contribute indirectly to long-standing physical health. This species, unlike other companion animals, needs to be exercised. The relationship between physical fitness and physiological well-being is well established. The increased physical activity that typically accompanies the ownership of a dog (see Dembicki & Anderson, 1996; Serpell, 1991) may thus explain, to some degree, the greater health advantages experienced by the owners of such pets.

Obviously, the mechanisms underlying the ability of dogs to prevent, and facilitate recovery from, ill-health are complex and much further research is needed before firm conclusions can be drawn. The possibility that there is a non-causal association (i.e. no correlation) between dogs and human health must also be acknowledged at this point in time (McNicholas & Collis, 1998; McNicholas, Collis, & Morley, 1995).

Dogs as predictors of ill-health

Recently, researchers have become interested in exploring whether dogs might be able to serve as early warning systems for certain types of physical ailment in humans, for example cancer, epilepsy and diabetes.

Cancer detection

In 1989, Williams and Pembroke reported a case in the *Lancet* of a border collie/Doberman pinscher crossbreed sniffing repeatedly at a mole on its owner's leg; the lesion later turned out to be malignant. Similar anecdotal reports have since appeared in newspapers (Dobson, 2003; Fraser, 2002) and scientific journals (Church & Williams, 2001).

That some dogs can detect cancerous masses is perhaps not surprising given their acute sense of smell (see Schoon, 1997 for review). Tumours typically produce odorous compounds that are released into the air through routes including breath and sweat (e.g. Di Natale *et al.*, 2003; Phillips *et al.*, 2003). The dog, with its olfactory acuity, may be able to detect these compounds, even in minute quantities.

While some dogs may have an innate ability to detect the odour of cancerous tumours, it appears that many dogs can be trained to perform this feat. In the first study of its kind, Willis and colleagues (2004) successfully trained six dogs of mixed breed to identify people with bladder cancer using a discrimination task. As a group, the dogs

correctly identified urine samples from patients with bladder cancer on 22 out of 54 occasions; a mean success rate of 41%. The authors hope that modifications to their training regime will result in improvements in the success rate of the dogs in their future studies.

Seizure detection

Evidence now suggests that certain dogs may be able to sense spontaneously oncoming epileptic seizures in humans (for review, see Dalziel, Uthman, McGorray, & Reep, 2003). Until recently, the notion that dogs could detect human seizures was based on little other than anecdotal report, and attempts to assess the validity of claims that dogs have innate seizure-alerting powers were relatively inconclusive (Edney, 1991, 1993). However, recent work has shown that some dogs can indeed detect oncoming seizures, and moreover, that many animals can be successfully trained to monitor their human owners for outward signs of an imminent seizure and to react in an appropriate manner (e.g. barking or pawing) if a seizure is predicted (Brown & Strong, 2001; Strong & Brown, 2000; Strong *et al.*, 2002, 1999).

The mechanism/s underlying the ability of dogs to anticipate seizures in humans is still unknown and warrants investigation (Lawson *et al.*, 2004). However, observations of dogs by trainers and surveys of alert dog owners suggests that seizure alerting is primarily based on visual cues such as facial expressions, postures and general behaviour as opposed to, for example, olfactory or auditory cues (Brown & Strong, 2001; Kirton *et al.*, 2004). That said, it is possible that other physiological cues such as muscle tension, respiratory signs and perspiration might also be monitored by dogs using visual, auditory or olfactory senses.

While seizure-detection dogs hold enormous potential for those with epilepsy (Kirton *et al.*, 2004; Strong, Brown, Huyton, & Coyle, 2002), the danger of using untrained animals as alert systems has been highlighted (Strong & Brown, 2000). Moreover, it has been suggested that while every dog may be able to detect seizures, not all animals respond appropriately to oncoming seizures, and hence careful selection and training is important (Dalziel *et al.*, 2003).

Hypoglycaemia detection

There is now some evidence to suggest that dogs may be able to detect hypoglycaemia, a common and hazardous complication of diabetes. Lim and associates (1992), for example, indicated that over one-third of dogs living with diabetic owners have been reported to show changes in their behaviour during their owners' hypoglycaemic episodes. Dogs may even be able to warn owners of impending hypoglycaemia before symptoms are noticed by those whose awareness of the condition is mostly intact (Chen *et al.*, 2000).

While it is unclear exactly how dogs may be able to detect hypoglycaemia, odour cues have been proposed as the most plausible explanation (Chen *et al.*, 2000). One dog, for example, was reported to exhibit hypoglycaemia-alert behaviour when its owner was asleep and presumably emitting no cues other than olfactory ones. Increases in sweating have been repeatedly noted in hypoglycaemic individuals (for review see McAulay, Deary, & Frier, 2001); it is likely that dogs can detect these changes in the chemical composition of their owners' sweat using their acute sense of smell. Research is now required to determine whether dogs can be trained to alert their owners to the

onset of hypoglycaemia in the same way that they can be trained to anticipate oncoming seizures or sniff out cancer.

Dogs and psychological health

Dogs may not only be able to facilitate certain aspects of physiological health in humans, they may also contribute towards the psychological well-being of people. Over the years, research has shown that animals, and in particular dogs, can ameliorate the effects of potentially stressful life-events (e.g. bereavement, divorce), reduce levels of anxiety, loneliness and depression (Folse, Minder, Aycock, & Santana, 1994; Garrity, Stallones, Marx, & Johnson, 1989) and enhance feelings of autonomy, competence and self-esteem (Beck & Katcher, 1983; Kidd & Kidd, 1985; Levinson, 1972; Robin & ten Bense, 1985; Triebenbacher, 1998). Many of these psychological benefits may arise directly from the companionship that dogs offer people (see Hart, 1995 for review). Their greeting rituals, naturally affectionate disposition, loyalty and widely perceived ability to love unconditionally may all serve to promote feelings of self-worth and self-esteem.

Dogs may also help to promote psychological well-being indirectly, through the facilitation of social interactions between people (McNicholas & Collis, 1998). Domestic dogs have long been noted for their socializing role. For example, Messent (1983), McNicholas and Collis (2000), and, more recently, Wells (2004) have all shown that walking with a dog results in a significantly higher number of chance conversations with complete strangers than walking alone. Younger dogs and those with a reputed good temperament tend to act as stronger social lubricants than older animals or those that have received more negative public attention (Wells, 2004). The social lubrication effect may be particularly apparent with, and useful for, disabled individuals with service animals (see later).

Dogs as therapists

Recognition of the fact that dogs can bolster psychological well-being in humans has resulted in their wide-spread use as therapists. In the 1960s, Boris Levinson, an American child psychologist, noted that his patients developed a rapport with his dog, Jingles, and were more inclined to respond positively to therapy in his presence. Levinson postulated that the dog served as a social catalyst, facilitating a safe channel for the discussion of subconscious worries and fears (Levinson, 1962, 1969, 1972). Levinson's theories have been supported by a wealth of subsequent studies exploring the role of dogs as pet-facilitated therapists in hospitals, nursing homes and other settings.

Dogs in hospitals and nursing homes

Pet-assisted therapy has been employed for numerous years in hospitals and residential nursing homes. Corson and others (1978, 1975, 1977, 1980) were among the first to assess the utility of dogs in these types of setting. In their original study 47 withdrawn and uncommunicative patients in a psychiatric unit were allowed to interact with self-chosen dogs on a daily basis. Five of the patients were noted to have improved markedly by the end of the study, and at least some psychological improvement was seen in all of the participants. While this study was heavily reliant on individual case histories and lacked rigorous control, more scientifically robust experiments have subsequently

revealed similar findings to these earlier results. Salmon and Salmon (1982), for instance, found that the presence of a residential dog in a nursing home resulted in 'happier', more 'alert' and more 'responsive' patients, as assessed by staff reports. More recently, Bernstein and associates (2000) discovered that animal-assisted therapy in the form of visits from rescue-sheltered dogs (and cats), facilitated social interactions (particularly long conversations) between residents of nursing homes. Numerous other authors have reported similar patterns of positive results in settings such as residential homes and hospital wards (e.g. Crowley-Robinson, Fenwick, & Blackshaw, 1996; Fick, 1993; Francis, 1985; Kaiser, Spence, McGavin, Struble, & Keilman, 2002; McCabe, Baun, Speich, & Agrawal, 2002; Moody, King, & O'Rourke, 2002; Schultz, 1987).

While none of the above studies are without their methodological problems (see Beck & Katcher, 1984), as a whole they tend to suggest that the presence of a dog in an institutional setting can help to facilitate many of the psychological benefits discussed earlier (e.g. increased self-esteem), break the vicious cycles of loneliness that many people experience and encourage social interactions and communication, both between patients and staff.

Pet-facilitated therapy programmes involving dogs are now relatively commonplace across the UK, Europe and North America (see Fine, 2000).

Dogs and the disabled

Dogs have been widely employed as assistants for the disabled for numerous years. Perhaps the best-known type of assistance dog is the Guide Dog for the Blind (or similar, e.g. The Seeing Eye, see Fishman, 2003). First established in 1931, the British Guide Dog Association has managed to help over 21,000 blind and partially sighted people through the provision of a carefully matched and trained assistance animal. More recently, dogs have been trained, both in the UK and further afield, to provide assistance to people with other types of disability including, for example, hearing difficulties (e.g. Hearing Dogs for Deaf People), mobility problems (e.g. Dogs for the Disabled) and epilepsy (e.g. Support Dogs, see earlier).

In addition to achieving the goal for which they were purposely trained (i.e. to enhance the physical capabilities of their owners), assistance dogs have been shown to contribute significantly to the psychological well-being of their owners (although some concerns regarding the methodological limitations of studies with assistance dogs have been voiced, see Sachs-Ericsson, Hansen, & Fitzgerald, 2002). Such animals can dramatically decrease the feelings of isolation that many with physical disabilities are prone to, and help to improve social confidence, self-esteem, independence and social identity (Allen & Blascovich, 1996; Delafield, 1975; Hart, Zasloff, & Benfatto, 1995; Lane *et al.*, 1998; Sanders, 2000; Steffens & Bergler, 1998; Valentine, Kiddoo, & Lafleur, 1993; Warnath & Seyfarth, 1982).

Assistance dogs can also act as strong social catalysts, helping to normalize relationships with other people. Hart and colleagues (1987), for example, reported that wheelchair users received a median of eight friendly approaches from unfamiliar adults per shopping trip when they were accompanied by their service dog, but typically only one friendly approach if the animal was not present. Similar findings have been reported by others (e.g. Eddy *et al.*, 1988; Mader, Hart, & Bergin, 1989; Steffens & Bergler, 1998).

It must be noted that assistance dogs are not without their complications. Owners of such animals have reported a variety of drawbacks including unwanted interference from members of the public, time and financial pressures and travel complications

(Davis, Natrass, O'Brien, Patronek, MacCollin, 2004; Hart *et al.*, 1995). The death of an assistance animal, or termination of an assistance partnership, can also present problems, particularly given the close bond of attachment that can develop between many owners and their service animals (Nicholson, Kempwheeler, & Griffiths, 1995). Over-attachments can also present problems for the animals themselves. Scott and Beifelt (1976), for example, noted signs symptomatic of separation anxiety (e.g. vocalization and destructiveness) in at least 21% of guide dogs separated from their owners. More recently, Davis and associates (2004) reported behaviour problems as the greatest burden to assistance dog placement in the paediatric population. Concerns regarding the physical welfare of assistance dogs have also been voiced (Serpell, Coppinger, & Fine, 2000). Raising owner awareness and expectations prior to animal placement, in addition to post-homing check-ups, may be the most useful strategies for overcoming these types of problem.

Dogs in prisons

Recently, institutions such as prisons have started to employ animals, including dogs, in a therapeutic capacity (see Strimple, 2003). Similar to those residing in other institutions, prison inmates can suffer from loneliness, denied responsibility and low self-worth. A wide variety of animal-based therapy schemes have thus been introduced to penal institutions, particularly in the United States, in a bid to enhance psychological welfare and rehabilitate previous offenders. Participants are required to look after the animal in their care, and in many cases train it for a specific purpose, e.g. as an assistance dog for the elderly or physically disabled (e.g. Hines, 1983; Walsh & Martin, 1994).

Research to explore the utility of dogs employed in this type of context is relatively limited, although that conducted has yielded largely positive results. Bustad (1990), for example, established a dog training programme at a correctional centre for women and reported increased levels of self-esteem in the participating inmates. Improvements in the behaviour of incarcerated, violent male juveniles, and their respect for authority, social interaction and leadership have also been noted following the introduction of abandoned and abused dogs with the programme Project Pooch (Merriam-Arduini, 2000).

People in the UK have been much slower to consider the introduction of dogs (or other animals) to prisons than the USA, although the positive results arising from the research in this area suggests that it is only a matter of time before similar schemes are commonplace in British penal institutions.

Conclusions

This paper has provided an overview of research that has explored the relationship between the domestic dog and human health. Taken together, the studies suggest that dogs can have prophylactic and therapeutic value for people. It must be borne in mind that not all of the studies carried out in this area have been methodically robust. The lack of longitudinal designs and standardized measures, which assess diverse areas of functioning, makes it difficult to draw finite conclusions. It must also be remembered that dogs can pose an enormous risk to human health, spreading zoonoses, causing allergies, bites and, in extreme circumstances, even death (e.g. Baxter, 1984; Baxter & Leck, 1984). That said, the risks that dogs pose to human well-being can be reduced to

an acceptable minimum through proper selection, training, veterinary care and control. The dog should not be regarded as a panacea for ill-health in humans. Nonetheless, the findings from this overview suggest that this particular companion animal can contribute to a significant degree to our well-being and quality of lives.

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