

Beneficial effects of pet ownership on some aspects of human health and behaviour

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Summary

A 10-month prospective study was carried out which examined changes in behaviour and health status in 71 adult subjects following the acquisition of a new pet (either dogs or cats). A group of 26 subjects without pets served as a comparison over the same period. Both pet-owning groups reported a highly significant reduction in minor health problems during the first month following pet acquisition, and this effect was sustained in dog owners through to 10 months. The pet-acquiring groups also showed improvements in their scores on the 30-item General Health Questionnaire over the first 6 months and, in dog owners, this improvement was maintained until 10 months. In addition, dog owners took considerably more physical exercise while walking their dogs than the other two groups, and this effect continued throughout the period of study. The group without pets exhibited no statistically significant changes in health or behaviour, apart from a small increase in recreational walking. The results provide evidence that pet acquisition may have positive effects on human health and behaviour, and that in some cases these effects are relatively long term.

Introduction

Current evidence for a beneficial effect of pet ownership on human health is inconclusive. The most frequently cited study in this field¹ found a positive statistical association between pet ownership and one-year survival in a sample of 92 coronary outpatients. However, the statistical methods employed have been criticised², and the results have not been replicated. A number of other studies have also demonstrated transient decreases in blood pressure and/or heart rate in experimental human subjects in the presence of pet animals, but so far none has provided evidence of sustained improvements in any physiological measure as the result of pet ownership³⁻⁶. A variety of cross-sectional health comparisons between pet-owning and non-owning populations have also produced unconvincing results. Some have failed to detect any apparent association between pet ownership and improved health status⁷⁻⁹, while others have produced positive results which are difficult to interpret. At best, they suggest that, if a person has a strong attachment for an animal companion, pet ownership may help to ameliorate the effects of negative life events, such as bereavement, and have a positive impact on certain anxiety and depression indices¹⁰⁻¹². Only one previous study¹³ employed a longitudinal research design to explore the possible effects of pet ownership on the health of 'normal' (ie non-institutionalized) human subjects. Three randomly-assigned

groups of elderly subjects were compared before, and at intervals after, providing each of them with either cage birds, house plants or no treatment. Unfortunately, although the authors reported significant improvements in the bird-owning group's social and psychological condition over a 5-month period, their results were based on very small sample sizes and doubtful statistical manipulations¹⁴.

The pilot study reported here investigated prospective changes in people's health, psychological state, and exercise levels over a 10-month period following the voluntary acquisition of a pet animal (either a dog or a cat). A non-matching group of persons without pets were assessed over the same period for the purposes of comparison.

Subjects and methods

Seventy-one adult pet owners (47 dog owners and 24 cat-owners) and 26 non pet owners participated in the study. The majority of pet owners were recruited during the acquisition of new pets from two local animal shelters, but three subjects acquired their pets from animal breeders. Persons who had owned either a dog or a cat during the previous year were excluded from the study, but no other selection criteria were imposed. Only one person per household participated in the study. In pet-owning households, the person who had greatest day-to-day involvement in the care of the animal was chosen to participate. For a variety of reasons, nine dog owners and three cat owners left the study before completion.

Initially, all subjects were interviewed at home and completed self-report questionnaires which pet owners were asked to return before or immediately after (within 1-2 days) taking their new pet home. To avoid positive or negative bias, subjects were informed that the purpose of the study was to 'explore the ways in which pets affect their owners'. In addition to obtaining basic personal and sociodemographic details, the questionnaires included three self-report measures of physical and psychological health: (1) a checklist of 20 minor health complaints experienced by subjects during the previous month (Table 1) (2) a measure of the number and approximate duration of recreational walks taken by subjects during the previous 2 weeks (Table 2) and (3) the 30-item General Health Questionnaire (GHQ-30) - a measure of psychological components of ill-health¹⁵.

All subjects completed questionnaires at the start of the study (baseline), and subsequently at one month, 6 months and 10 months. All questionnaires were similar in structure, although the GHQ-30 was excluded at one month. The data were analysed using Statview 512+ and SPSS[×] statistical packages. Since

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Table 1. Checklist of minor health problems*

Please tick/underline any of the following health problems you have suffered during the last month:

1. headaches	12. trouble with feet
2. hay fever	13. difficulty concentrating
3. difficulty sleeping	14. palpitations or breathlessness
4. constipation	15. trouble with ears
5. trouble with eyes	16. worrying over every little thing
6. a bad back	17. indigestion or other stomach trouble
7. nerves	18. sinus trouble or catarrh
8. colds and flu	19. persistent cough
9. general tiredness	20. faints or dizziness
10. kidney or bladder trouble	
11. painful joints	

Scoring method: Sum total number of items ticked/underlined

*Question adapted from Cox, BD *et al.* *The Health and Lifestyle Survey*. London: Health Promotion Trust, 1987

the data on health and walking were skewed, and the GHQ-30 scores were based on ordinal rating-scales, non-parametric statistical procedures¹⁶ were employed. Unless otherwise stated, significance levels are based on 2-tailed tests.

Results

Baseline comparisons

Baseline comparisons revealed that non-owners had fewer children on average than dog owners (Mann-Whitney U Test, $Z=1.96$, $P=0.05$), belonged to somewhat higher socioeconomic groups than pet owners (dog and cat owners combined, $Z=2.048$, $P=0.04$), and were less likely to have access to gardens ($\chi^2=10.38$, $P=0.006$). Dog owners also took significantly more/longer recreational walks per fortnight than cat owners ($Z=2.297$, $P=0.02$).

The three groups did not differ significantly from each other in terms of age, marital status, sex-ratio, type of housing, number of minor health problems reported, or GHQ-30 scores.

Changes within groups

Sample medians and interquartile ranges for the three variables (health problems, GHQ-30 scores, and

Table 2. Measure of walk number/duration

Alongside each of the categories given below, indicate the number of walks you have taken during the last fortnight (other than walking to work, the shops, etc.).

Category	Number of walks
1. Short walks (less than 20 min)	
2. Medium walks (20-60 min)	
3. Long walks (more than one hour)	

Scoring method: Score 1 for each short walk, 2 for medium walks and 3 for long walks. Sum to obtain total number of walk units/fortnight.

number/duration of recreational walks) are provided in Table 3. According to these results, the non-owning group did not change significantly in either the number of minor health problems they reported or their scores on the GHQ-30 over the ten month period of study. They did, however, report a small but significant increase in the number/duration of recreational walks taken between the beginning of the study and 10 months (Wilcoxon S R Test, $Z=2.06$, $P=0.04$). This result may have been due to a seasonal effect, since the bulk of the final questionnaires were completed by non-owners during July-September, somewhat later than either of the pet-owning groups.

Dog-owners reported a highly significant reduction in minor health problems ($Z=4.19$, $P<0.0001$) during the first month of the study, and this effect persisted to 6 months ($Z=3.894$, $P<0.0001$) and 10 months ($Z=2.056$, $P=0.02$), respectively. Dog-owners also exhibited a highly significant reduction (ie improvement) in their GHQ-30 scores during the first 6 months after acquiring a pet ($Z=3.442$, $P=0.0006$), and some improvement was still apparent after 10 months ($Z=2.467$, $P=0.01$). In addition, dog-owners displayed a dramatic increase in the number/duration of recreational walks taken after the first month ($Z=4.482$, $P<0.0001$), and this increase was maintained until 6 months ($Z=4.585$, $P<0.0001$) and 10 months ($Z=4.837$, $P<0.0001$).

Table 3. Medians and interquartile ranges for: the number of minor health problems reported; 30-Item General Health Questionnaire scores, and the number/duration of recreational walks taken

	Baseline		1 month		6 months		10 months	
	Median (inter-quartile range)	n	Median (inter-quartile range)	n	Median (inter-quartile range)	n	Median (inter-quartile range)	n
Health								
No pets	4.0 (2.0-6.5)	25	4.0 (3.0-5.0)	26	4.0 (2.0-5.0)	25	4.0 (3.0-5.0)	26
Cats	4.0 (2.0-6.0)	24	2.0 (1.0-3.0)	24	3.0 (1.5-4.0)	21	3.0 (2.0-5.0)	21
Dogs	4.0 (2.0-5.0)	46	2.0 (1.0-3.0)	47	2.0 (1.0-3.0)	40	3.0 (1.0-4.0)	39
GHQ-30								
No pets	22.0 (18.0-29.0)	25			21.0 (14.5-26.75)	24	20.5 (17.75-33.0)	26
Cats	20.0 (17.0-28.0)	23			17.0 (13.75-22.5)	22	16.0 (13.0-30.0)	21
Dogs	22.0 (15.75-29.25)	46			17.0 (14.0-22.0)	39	17.0 (15.0-22.0)	39
Walks								
No pets	4.0 (1.0-6.0)	25	3.0 (1.0-8.5)	25	3.0 (1.0-11.5)	25	3.5 (1.75-10.5)	26
Cats	1.0 (0-5.75)	24	1.0 (0-4.0)	24	3.0 (1.0-6.5)	21	2.0 (0.5-6.5)	21
Dogs	4.0 (1.0-8.0)	47	18.0 (4.0-46.5)	46	28.0 (6.5-44.0)	40	22.0 (8.0-44.0)	39

Cat-owners also reported a significant reduction in minor health problems ($Z=3.1977$, $P=0.001$) during the first month after pet acquisition, but this effect was no longer statistically significant after 6 months. Similarly, cat owners displayed a small improvement in their scores on the GHQ-30 during the first 6 months, although the result was only significant using a one-tailed probability estimate ($Z=1.779$, $P=0.04$, one-tailed). Unlike the other two groups, cat owners showed no significant changes in the number/duration of walks taken over the 10 months of study. These trends are illustrated in Figures 1-3.

Since dog owners exhibited much stronger and more durable health changes following pet acquisition than cat owners, the possible effects on health of increased recreational walking were explored. Within the dog-owning group, no statistically significant associations were found between increases in recreational walking and self-reported improvements in health between either baseline and one month, baseline and 6 months, or baseline and 10 months. Improvements in GHQ-30 scores between baseline and 6 months were positively associated with an increase in the number/duration of walks taken over the same period of time (Kendall $\tau=0.34$, $P=0.003$), but this association had disappeared by 10 months.

Differences between groups

When groups were compared for changes in the number of health problems they reported between baseline and one month (ie scores at one month - baseline scores), significant differences were found between pet owners and non-owners. Non-owners reported significantly smaller changes in health than either dog owners (Mann-Whitney U Test, $Z=2.532$, $P=0.013$) or cat owners ($Z=2.506$, $P=0.012$). Similar comparisons for the periods from baseline to 6 months, and baseline to 10 months, however, produced no other significant differences between groups. Differences in GHQ-30 scores between baseline and 6 months, and baseline and 10 months were also non-significant using a non-parametric test, although dog owners did show a significant improvement compared with non-owners between baseline and 10 months using the equivalent parametric test ($T=2.20$, $P=0.031$). The absence of significant differences between groups during the latter part of the study appear to have been due to a discernible (though non-significant) improvement in non-owner's health during this period (see Figure 1). Seasonal differences in the timing of the 6 month and 10 month assessments may have contributed to this effect (see above).

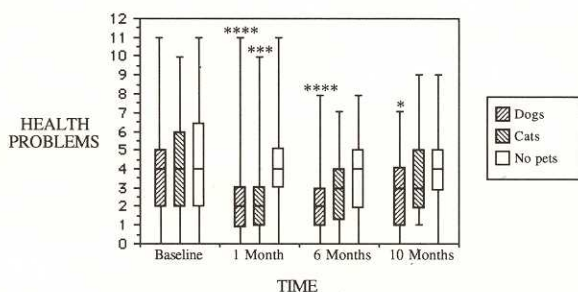


Figure 1. Changes in reported incidence of minor health problems in the three sample groups showing medians, upper & lower quartiles, and maximum and minimum scores (significant reductions from baseline values are shown as **** $P < 0.0001$, *** $P \leq 0.001$, and * $P < 0.05$)

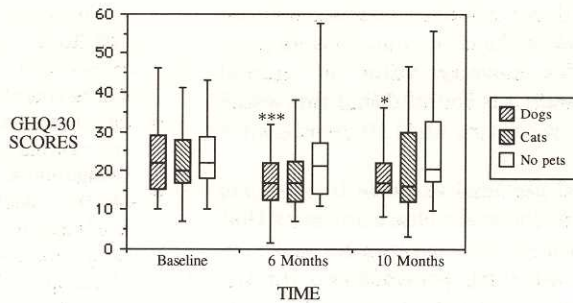


Figure 2. Changes in 30-item General Health Questionnaire scores in the three sample groups showing medians, upper & lower quartiles, and maximum and minimum scores (significant reductions from baseline values are shown as: *** $P < 0.001$, and ** $P \leq 0.01$)

Discussion

The effects of pet acquisition on human health and behaviour cannot be investigated using conventional double-blind, placebo-controlled trials. Also, people voluntarily acquiring pets from animal shelters, and agreeing to participate in research, are not a randomly-selected sample. Despite these methodological limitations, the results of the present study appear to demonstrate beneficial changes in health and behaviour in a majority of persons acquiring new pets. No equivalent improvements were detected in a comparable group of persons without pets during the same period, despite the absence of statistically significant differences in health or behaviour between the non-owners and either of the pet-owning groups at the beginning of the study.

The changes in health reported by the pet-acquiring groups were general rather than specific, and could not be attributed to chance improvements in seasonal ailments, such as colds, coughs or hay fever. In dog owners, for example, all but two health problems (neither of which changed) were reported at lower frequencies one month after pet acquisition. In cat owners all but four decreased in frequency, while in the non-owning group nine decreased, six increased, and the remaining five did not change in frequency.

No clear explanation for the mechanisms responsible for the observed changes in pet owners emerges from these findings, and the possibility of some form of effect arising from owners' prior expectations deserves further investigation. However, the marked difference in the responses of dog owners and cat owners over the 10 months of study would tend to argue against such an effect, since subjects should have no a priori reason for assuming that dog ownership is any more beneficial than cat ownership. The pronounced

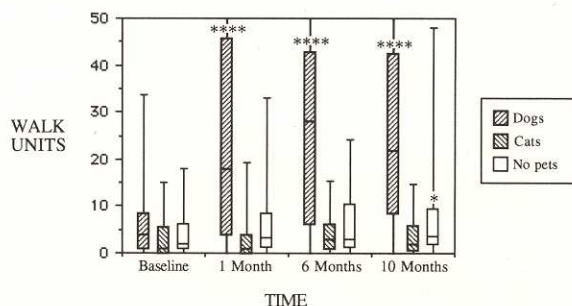


Figure 3. Changes in the number/duration of recreational walks taken in the three sample groups showing medians, upper & lower quartiles, and maximum and minimum scores (significant increases from baseline values are shown as: **** $P < 0.0001$, and * $P < 0.05$)

reduction in the incidence of minor health problems during the first month of the study may also, in part, be attributed to the novelty value of animal companionship, although it is doubtful that this would explain health effects persisting until 10 months after pet acquisition.

Although increased physical exercise in the form of walking, was one of the main characteristics that distinguished dog owners from cat owners and non-owners, the results of the study provided only limited evidence that walking, on its own, accounted for the more pronounced and longer lasting health benefits reported by dog owners. For the dog owning population as a whole, however, such substantial increases in daily physical exercise would be likely to have long-term health implications: for example, reduced incidence of hip fractures among the elderly^{17,18} and beneficial changes in high-density lipoprotein cholesterol concentrations¹⁹.

Judging from existing medical literature, pet-ownership is not at present considered to be a significant contributory factor in public health, except as a source of injuries, allergies and zoonotic disease^{20,21}. Although based on a limited sample, the results presented in this paper demonstrate a number of positive health effects from acquiring a companion animal. Further research is needed to explore the mechanisms and the areas of particular benefit.

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