

Pet Ownership and Health in Older Adults: Findings from a Survey of 2,551 Community-Based Australians Aged 60-64

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Key Words

Older community residents · Pet ownership, health benefits · Health, physical measures of · Personality traits

Abstract

Background: It is commonly assumed that owning a pet provides older residents in the community with health benefits including improved physical health and psychological well-being. It has also been reported that pet owners are lower on neuroticism and higher on extraversion compared with those without pets. However, findings of research on this topic have been mixed with a number of researchers reporting that, for older people, there is little or no health benefit associated with pet ownership. **Objective:** To identify health benefits associated with pet ownership and pet caring responsibilities in a large sample of older community-based residents. **Methods:** Using survey information provided by 2,551 individuals aged between 60 and 64 years, we compared the sociodemographic attributes, mental and physical health measures, and personality traits of pet owners and non-owners. For 78.8% of these participants, we were also able to compare the health services used, based on information obtained from the national insurer on the number of general practitioner (GP) visits they made over a 12-month period. **Results:** Compared with non-

owners, those with pets reported more depressive symptoms while female pet owners who were married also had poorer physical health. We found that caring for a pet was associated with negative health outcomes including more symptoms of depression, poorer physical health and higher rates of use of pain relief medication. No relationship was found between pet ownership and use of GP services. When we examined the personality traits of pet owners and carers, we found that men who cared for pets had higher extraversion scores. Our principal and unexpected finding, however, was that pet owners and carers reported higher levels of psychoticism as measured by the Revised Eysenck Personality Questionnaire. **Conclusions:** We conclude that pet ownership confers no health benefits for this age group. Instead, those with pets have poorer mental and physical health and use more pain relief medication. Further, our study suggests that those with pets are less conforming to social norms as indicated by their higher levels of psychoticism.

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Introduction

It is commonly assumed that owning a pet provides older residents in the community with various health benefits including improved physical health and better psy-

chological well-being. Older people with strong pet attachments have been found to be less likely to experience symptoms of depression and, where human support is limited, better physical health [1]. Similarly, Siegel [2] found that older pet owners reported fewer stressful life events. Pet ownership benefits have also been ascribed to particular sub-groups of older residents, including those whose children have left home and those who are widowed [3]. Other research has identified older pet owners as being less likely to use blood pressure medication [4], and older dog owners more likely to walk and to have lower triglycerides [5]. The direction of any relationship between owning a pet and experiencing good health has not been established. For older individuals, good health, particularly good physical health, may be required for, and not the result of, owning a pet.

Moreover, research on this topic has produced mixed results. In a sample of community residents aged 65 and older, Raina et al. [6] found that pet owners reported being able to undertake more everyday activities compared with non-pet owners, but that pet ownership was not associated with any differences in psychological well-being. A number of researchers have also found that pet ownership by older community residents confers no specific health benefit as measured by mortality [4, 7] or emotional distress [8]. Other studies have reported negative factors associated with pet ownership for older people, including higher rates of boredom and loneliness [9] and increased unwillingness to make significant life choices such as surgery that would require separation from a pet [9].

Aside from the potentially detrimental underuse of health care just described, if older people do derive health benefits from pet ownership, it might be expected that this lifestyle choice would then reduce their requirement for health services. Given that older people use significantly higher levels of medical services [10] such benefits could have important implications not only for the individual but also for health service funders. Partial support for this hypothesis comes from a prospective study undertaken by Simons et al. [4] who found that older women with pets had a reduced risk of hospitalization over a 9-year period. Older owners of cats and dogs have also been found to use fewer medications and make fewer doctor visits, although the second of these findings was not statistically significant [11]. On the other hand, findings from other research have not supported this hypothesis [12].

A third group of factors that might be associated with pet ownership, personality traits, has received consider-

ably less attention. It has been argued that, compared with non-owners, those who own pets are likely to have lower levels of neuroticism and higher levels of both extraversion and attachment to humans [13–16]. However, support for this hypothesis is limited, and the studies that have explored this issue have considered only undergraduate students. Since older individuals with lower levels of neuroticism and higher levels of extraversion have also been found to have better health [17], it may be that pet ownership is only indirectly linked to health through such personality attributes.

We examined the associations between pet ownership, pet caring responsibilities, health measures and personality traits in a community-based sample of 2,551 older adults who participated in the Personality and Total Health (PATH) Through Life Project, conducted by the Centre for Mental Health Research, Canberra, Australia. Information on pet ownership provided by participants included whether or not they owned one or more pets, what type of pets they owned and, for each type of pet owned, whether or not they were the main carers of those types of pets. Other information obtained from participants included sociodemographic attributes, measures of mental and physical health, positive and negative affect, use of medications, and personality measures including neuroticism, extraversion, and psychoticism. For 78.8% of respondents, information was also obtained from the national insurer on the number of medical services they had obtained from general practitioners (GPs) during the 6 months preceding and the 6 months following their participation in the survey.

In our analyses, we tested the following hypotheses: (i) that older people owning or caring for pets would report better mental and physical health and use fewer health services than those without pets or caring responsibilities; (ii) that pet owners and carers would have lower neuroticism scores and higher extraversion scores than those not owning or caring for a pet, and (iii) after taking into account personality traits, pet owners would continue to report better mental and physical health than non-owners.

Methods

Participants

The PATH Through Life Project is a longitudinal study of 3 age groups of residents living independently in the community in the Australian Capital Territory and the neighboring town of Queanbeyan, New South Wales. The present study focuses on the oldest age group of participants who were aged between 60 and 64 years on January 1, 2001. Potential participants were drawn from the

Table 1. Levels of pet ownership and pet care responsibility

Own	n	% of all participants	Have responsibility for caring for	n	% of all participants
Any pet	1,240	48.6	Any pet	827	32.5
One or more dogs	843	33.0	One or more dogs	547	21.4
One or more cats	543	21.3	One or more cats	317	12.4
One or more birds	166	6.5	One or more birds	92	3.6
One or more fish	163	6.4	One or more fish	99	3.9
Other types of pets	44	1.7	Other types of pets	31	1.2

Australian Electoral Rolls for Canberra and Queanbeyan. Enrolment on these rolls is compulsory for Australian citizens aged 18 and over. All potential respondents were initially sent a letter explaining the purpose of the research, and, if willing to participate, were then interviewed by professionally trained interviewers. Answers to most questions, including those being considered for this study, were self-entered by the participants into a hand-held computer under the supervision of the interviewer who provided assistance in use of the computer when required. The number of potential participants found and confirmed to be in the required age group was 4,378, of whom 2,551 participated, giving a response rate of 58.3%.

Measures

Survey items covered sociodemographic characteristics, well-being, physical and mental health measures and personality traits. All participants were asked whether or not they owned a dog, cat or other pet that they could touch or talk to. Those identified as pet owners were then asked whether they owned one or more dogs, one or more cats, one or more birds, fish or another type of pet. For each type of pet owned, participants were asked whether or not they had primary responsibility for caring for that type of pet. Health information obtained from participants included measures of their physical and mental health in the past month using the 12-item Short-Form Health Survey (SF-12) [18]. SF-12 scores have a mean of 50 and standard deviation of 10 with higher scores indicating better physical or mental health. Other mental health information included levels of depressive and anxiety symptoms using Goldberg's scales [19] and Positive and Negative Affect using the Positive and Negative Affect Scale (PANAS) [20]. The level of Positive Affect reflects the extent to which an individual is enthusiastic and active [20], attributes that have been ascribed to pet ownership [21]. Participants also answered questions on their use of medication during the past month to treat high blood pressure, assist them to sleep or to relieve pain. Other items collected included: measures of neuroticism, extraversion and psychoticism from the short-form Eysenck Personality Questionnaire-Revised (EPQ-R) [22]. The last of these traits is misnamed and is better understood as a measure of such attributes as impulsivity, autonomy and aggression [23].

Information on participants' visits to GPs was also obtained. In Australia, the costs of all health care visits made to medical practitioners by Australians with citizenship or residency status are subsidized, either partly or totally, through the government-funded universal health insurance scheme, Medicare. Informa-

tion on the number of visits made is collected by the Health Insurance Commission. These data are used for administrative purposes and identify the type of medical practitioner providing the service, but not the health problems addressed during a visit. All participants were asked if they would consent to the researchers being provided information on the number of visits they made to GPs for specified periods before and after their interview. For the 2,010 (78.8%) who consented, information was then obtained from the Health Insurance Commission on the number of GP visits they had made in the 6 months preceding and the 6 months following their being surveyed.

Statistical Analyses

Preliminary analyses provided descriptive statistics on levels of pet ownership reported by survey participants and on attributes of those with and without pets. The mean mental and physical health measures, and GP services obtained, were then estimated for the sample as a whole and for the 2 groups: those who owned any pet and those who cared for any pet. Similar analyses then compared personality traits of pet owners and non-owners, and pet carers and non-carers. The final analysis examined the impact of pet ownership on mental and physical health and GP service use, after taking into account the individual's levels of neuroticism, extraversion and psychoticism as measured by the EPQ-R. Statistical analyses were undertaken using SPSS 11.5.

Results

Almost half of our sample of 2,551 participants reported that they owned any type of pet with 95% of these pet owners owning a cat or dog. Two thirds of the pet owners surveyed were also identified as being the main carer of their pets. More information on the levels of ownership and caring responsibilities for different types of animals is given in table 1. Our initial analyses compared sociodemographic attributes of pet owners with non-owners and pet carers with non-carers (this last group comprising those without pets at all and those with pets who did not have primary responsibility for them). The results of these analyses are given in table 2. While similar pro-

Table 2. Sociodemographic attributes of pet owners and non-owners, and pet carers and non-carers; means and 95% confidence intervals

Attribute	Own a pet		p	Care for a pet		p
	no (n = 1,308)	yes (n = 1,240)		no (n = 1,721)	yes (n = 827)	
Female, %	47.10 (44.39–49.81)	49.56 (46.77–52.34)	0.215	44.95 (42.60–47.30)	55.25 (51.86–58.64)	<0.001
In married or in de facto relationship, %	77.71 (75.45–79.97)	78.16 (75.86–80.46)	0.783	81.36 (79.52–83.20)	70.81 (67.71–73.91)	<0.001
Mean number of children in household	0.12 (0.10–0.14)	0.24 (0.21–0.27)	<0.001	0.17 (0.15–0.20)	0.19 (0.16–0.23)	0.333
Working full-time, %	21.53 (19.30–23.76)	22.32 (20.00–24.64)		23.40 (21.40–25.40)	18.82 (16.15–21.48)	
Working part-time, %	16.41 (14.40–18.42)	21.43 (19.15–23.72)		17.13 (15.35–18.91)	22.44 (19.59–25.28)	
Unemployed, %	0.69 (0.24–1.13)	1.21 (0.60–1.82)		0.75 (0.35–1.16)	1.32 (0.55–2.11)	
Not in the labor force, %	61.15 (58.50–63.79)	54.96 (52.18–57.73)	0.033	58.54 (56.21–60.87)	57.30 (53.92–60.67)	0.318
Mean years of education	13.91 (13.76–14.07)	13.61 (13.46–13.77)	0.007	13.88 (13.74–14.01)	13.53 (13.35–13.72)	0.004

portions of men and women owned a pet, women were much more likely to report that they had primary caring responsibilities. Levels of pet ownership were similar for those living with a partner – either married or in a de facto relationship – and those not in such a relationship; that is those who were separated, divorced, widowed or never married. Those with pets were more likely to have children living with them full-time in their household. Pet owners were also more likely to be in the workforce and have fewer years of education compared with those without pets. Also, those caring for pets had less education than non-carers.

We then compared measures of mental and physical health and GP service use for those owning or not owning pets and those with and without caring responsibilities. These analyses controlled for two sociodemographic factors: sex, and whether or not the participant was married or in a de facto relationship. It has been argued that those not living with a partner may obtain greater benefit from pet ownership [3]. All two-way interaction terms between pet ownership, sex and marital status were tested and where these were found to be significant, analyses were then done separately by sex or marital status as appropriate. As seen in table 3, both pet owners and carers reported more depressive symptoms while married women with pets had worse physical health. Pet carers' physical health also varied significantly with marital status. Those who were married or in a de facto relationship reported significantly poorer physical health compared with their counterparts who did not have caring roles. Pet ownership and pet caring responsibility had no impact on numbers of GP services obtained over a 12-month period. Pet

carers, however, were more likely to have used pain relief medication in the 4 weeks preceding their interview. Since some research has indicated that owning a dog, but not a cat is associated with improved physical health in the general population [24], we repeated this analysis for those owning a dog but not a cat. Similar results were again obtained. Compared with the rest of the sample, those owning dogs, but not cats, reported significantly poorer physical health as measured by the SF-12: 47.06 (95% CI 46.27–47.84) compared with 48.23 (95% CI 47.97–48.88); $p = 0.003$.

Our next analysis explored differences in personality measures associated with owning or caring for a pet (table 4). While owners and non-owners had comparable levels of extraversion, men who cared for pets had higher levels of this trait. We found no difference in levels of neuroticism associated with ownership or caring but found a strong association between ownership and caring roles and levels of psychoticism of our participants. Pet owners and carers reported significantly higher levels of psychoticism compared with non-owners and non-carers. When we explored associations between pet ownership and each of the 12 items on the psychoticism scale, we found pet owners to be significantly more likely to answer that they preferred to go their own way ($p = 0.005$), that they considered that marriage was old-fashioned ($p = 0.003$) and that they liked others to be afraid of them ($p < 0.001$). These findings concerning higher levels of psychoticism continued to apply when we compared those owning dogs or cats and those owning only other types of pets.

Our final analysis compared mental and physical health measures associated with pet ownership and caring

Table 3. Measures of health and GP service use for pet owners and non-owners, and pet carers and non-carers: estimated marginal means and 95% confidence intervals controlling for sex and marital status

Health measure	Own a pet			Care for a pet		
	no	yes	p	no	yes	p
SF-12 mental health ^a	54.40 (53.97–54.83)	54.03 (53.59–54.47)	0.230	54.25 (53.88–54.63)	54.15 (53.61–54.69)	0.766
Depressive symptoms ^a	1.57 (1.46–1.67)	1.79 (1.69–1.90)	0.002	1.62 (1.53–1.71)	1.79 (1.67–1.92)	0.029
Anxiety symptoms ^a	2.20 (2.08–2.33)	2.29 (2.16–2.42)	0.355	2.19 (2.08–2.30)	2.35 (2.20–2.51)	0.094
Negative affect ^a	13.81 (13.55–14.08)	14.00 (13.73–14.27)	0.342	13.82 (13.59–14.05)	14.08 (13.74–14.41)	0.212
Positive affect ^a	31.36 (30.96–31.76)	31.16 (30.75–31.57)	0.501	31.29 (30.94–31.64)	31.20 (30.70–31.71)	0.787
SF-12 physical health by:						
Men						
In married or de facto relationship	49.29 (48.51–50.07)	48.67 (47.87–49.46)	0.275			
Not in married or de facto relationship	47.51 (45.60–49.42)	48.88 (46.36–51.40)	0.392			
Women						
In married or de facto relationship	48.86 (47.99–49.81)	46.38 (45.39–47.37)	<0.001			
Not in married or de facto relationship	46.36 (44.71–48.02)	46.35 (44.81–47.89)	0.993			
SF-12 physical health by:						
In married or de facto relationship ^b				48.89 (48.37–49.40)	47.31 (46.51–48.11)	0.001
Not in married or de facto relationship ^b				46.38 (45.17–47.59)	47.51 (46.12–48.91)	0.233
GP services used over 12 months ^a	6.18 (5.87–6.48)	6.24 (5.93–6.56)	0.768	6.19 (5.92–6.46)	6.24 (5.85–6.63)	0.840
	1Odds ratio (95% CI)		p	1Odds ratio (95% CI)		p
Taking blood pressure medication ^a	1.01 (0.86–1.19)		0.903	0.89 (0.74–1.07)		0.206
Taking sleep medication*	1.00 (0.79–1.25)		0.981	1.01(0.79–1.28)		0.964
Taking pain-relief medication ^a	1.14 (0.97–1.34)		0.104	1.23 (1.04–1.46)		0.016

^a Controlling for sex and marital status.

^b Controlling for sex.

after taking into account levels of neuroticism, extraversion and psychoticism as measured by the short form of the EPQ-R. Pet owners continued to report significantly more depressive symptoms (table 5). Men who owned pets also had poorer mental health as measured by the SF-12 and male carers had more depressive symptoms. Again, married women who owned a pet reported poorer physical health than those without pets, while married men and women caring for pets had worse physical health than those without these responsibilities. The finding that pet carers were more likely to have used medication for pain relief continued to apply.

Discussion

Health Measures of Pet Owners and Carers

In this study, we examined associations between pet ownership and caring responsibilities on the one hand, and mental and physical health and personality measures on the other, in a large community-based sample of Australians aged 60–64 years. The first of our hypotheses was that pet owners would report better mental and physical health and use fewer health services than those without pets. We found little evidence to support this hypothesis. On average, both pet owners and carers in this study reported significantly more depressive symptoms. These findings diverge from previous research presenting positive health benefits in pet attachment, in particular the study by Garrity et al. [1] who found older individuals with strong pet attachments reported fewer depressive

Table 4. Personality measures of pet owners and non-owners, and pet carers and non-carers: estimated marginal means and 95% confidence intervals

Health measure	Own a pet			Care for a pet		
	no	yes	p	no	yes	p
EPQ-R extraversion ^a	6.72 (6.53–6.91)	6.62 (6.43–6.81)	0.453			
EPQ-R extraversion by:						
Men ^b				6.41 (6.19–6.63)	6.92 (6.57–7.27)	0.016
Women ^b				6.87 (6.63–7.12)	6.68 (6.36–7.00)	0.345
EPQ-R neuroticism ^a	3.28 (3.12–3.44)	3.35 (3.18–3.51)	0.588	3.3 (3.1–3.4)	3.3 (3.1–3.6)	0.65
EPQ-R psychoticism ^a	1.61 (1.53–1.68)	1.86 (1.78–1.94)	<0.001	1.62 (1.56–1.69)	1.95 (1.85–2.04)	<0.001

^a Controlling for sex and marital status.

^b Controlling for marital status.

symptoms. One possible reason for this difference in findings may be that our study did not specifically examine the strength of pet attachment but whether the individual was the primary pet carer. While such caring responsibilities have been seen as likely to encourage bonding between animal and owners, they may also be perceived as chores, for example, restraining a barking dog or taking it for regular walks.

We found that female pet owners reported worse physical health than their counterparts who did not have any pets, while pet carers who were married or in de facto relationships reported poorer physical health than those who were not the main carers. Those caring for pets were also more likely to use pain relief medication. Owning or caring for a pet was not associated with any reduction in numbers of GP services obtained over a 12-month period.

In their study of older individuals (mean age 73 years), Raina et al. [6] found pet owners had better physical health than those without pets. In that earlier analysis, physical health was measured by the extent to which participants were able to complete activities of daily living. While the difference in age of the two samples may explain some of this difference in findings between that research and our study, it is also the case that the SF-12 measure that we used provides a broader self-assessment of physical health. Individuals may well be able to complete all activities of daily living but still self-assess that they have relatively poor physical health that limits the ease with which they can undertake other non-essential activities.

Our finding that neither pet ownership nor pet caring conferred benefits by reducing the number of GP ser-

vices obtained aligns with that reported by Jorm et al. [12] in their examination of an older sample. Headey's [11] conclusion that such benefit attaches to pet ownership came from a survey of pet owners aged 16 and over, and did not apply to men or women aged 54 and over. That analysis also drew on self-reports of medical service use rather than independently collected information as used in our current study. We further found that pet carers used significantly more pain relief medication. These findings have some correspondence with an earlier study by Hirsch and Whitman [25], in which they found that those reporting headaches and chronic pain were somewhat more likely to have pets. Similar findings for a younger age group have also been reported by Parslow and Jorm [26].

Personality Traits Associated with Pet Ownership

We further hypothesized that pet owners and carers would have lower neuroticism scores and higher extraversion scores than those not owning or caring for a pet. Our findings partly support this hypothesis. Unlike previous research, for example, that of Paden-Levy [15], we did not find that pet owners were likely to have lower levels of neuroticism. We did find, however, that in this older age group, men with caring responsibilities reported higher levels of extraversion than non-carers. Previous research has found that walking a dog is likely to prompt social interaction between the owner and other people [14]. However, our analysis concerned male carers of all types of pets, not only dogs and this extraversion-caring relationship did not apply for older women in our study. Other reasons for this association for pet caring and extraversion cannot be deduced from this study.

Table 5. Measures of health and GP service use for pet owners and non-owners, and pet carers and non-carers: estimated marginal means and 95% confidence intervals controlling for personality traits, sex and marital status

Health measure	Own a pet			Care for a pet		
	No	yes	p	no	yes	p
SF-12 mental health ^a				54.26 (53.93–54.60)	54.31 (53.83–54.79)	0.881
SF-12 mental health by						
Men ^b	54.85 (54.34–55.36)	53.92 (53.39–54.46)	0.014			
Women ^b	53.95 (53.38–54.52)	54.33 (53.76–54.90)	0.355			
Depressive symptoms ^a	1.58 (1.50–1.67)	1.77 (1.68–1.86)	0.004			
Depressive symptoms by						
Men ^b				1.48 (1.39–1.58)	1.81 (1.65–1.97)	0.001
Women ^b				1.79 (1.67–1.91)	1.76 (1.61–1.92)	0.782
Anxiety symptoms ^a	2.23 (2.12–2.33)	2.26 (2.15–2.37)	0.653	2.20 (2.11–2.30)	2.33 (2.19–2.46)	0.142
Negative affect ^a	13.87 (13.65–14.09)	13.94 (13.71–14.17)	0.658	13.86 (13.66–14.05)	14.01 (13.73–14.29)	0.384
Positive affect ^a	31.29 (30.92–31.66)	31.23 (30.84–31.61)	0.804	31.28 (30.96–31.60)	31.22 (30.75–31.69)	0.825
SF-12 physical health by						
Men						
In married or de facto relationship	49.26 (48.49–50.02)	48.77 (48.00–49.55)	0.385			
Not in married or de facto relationship	47.51 (45.62–49.40)	48.82 (46.31–51.33)	0.416			
Women						
In married or de facto relationship	48.87 (47.92–49.82)	46.52 (45.54–47.50)	<0.001			
Not in married or de facto relationship	46.05 (44.40–47.71)	46.67 (45.15–48.20)	0.593			
SF-12 physical health by						
In married or de facto relationship ^c				48.89 (48.38–49.40)	47.48 (46.70–48.27)	0.003
Not in married or de facto relationship ^c				46.26 (45.06–47.46)	47.70 (46.32–49.08)	0.128
GP services used over 12 months	6.19 (5.89–6.49)	6.23 (5.92–6.54)	0.843	6.21 (5.95–6.48)	6.20 (5.82–6.58)	0.948
	1Odds ratio (95% CI)		p	1Odds ratio (95% CI)		p
Taking blood pressure medication	1.01 (0.86–1.20)		0.875	0.90 (0.75–1.08)		0.249
Taking sleep medication	0.96 (0.76–1.21)		0.715	0.97 (0.76–1.25)		0.813
Taking pain-relief medication	1.13 (0.96–1.33)		0.141	1.22 (1.03–1.45)		0.025

^a Controlling for personality traits, sex and marital status.

^b Controlling for personality traits and marital status.

^c Controlling for personality traits and sex.

An unexpected finding was that owners and carers of pets reported significantly higher levels of psychoticism than non-owners and non-carers, in particular that they preferred to go their own way and liked others to be afraid of them. This outcome has not been reported previously but is compatible with earlier studies that found pet owners liked pets more than they liked people [13, 27] and that those with low levels of social interaction were more likely to choose to own a pet possibly as a partial substitute for this lack [28]. We suggest that, in this study, higher psychoticism measures indicate that individuals are

less likely to conform to social norms and more likely to act aggressively. Of course, this finding that pet owners have higher levels of psychoticism cannot be taken as evidence of a causal relationship in either direction. In view of the earlier findings that pet owners and carers reported worse health but levels of neuroticism comparable with non-owners and non-carers, it was not surprising that accounting for personality factors made little difference to the negative associations between health and owning or caring for pets. Overall, in this study of a large community sample of older Australians, we have consis-

tently found that there are no health benefits associated with pet ownership for this age group.

As other researchers have noted, a cross-sectional study such as this cannot determine causal links between health and personality measures and keeping of household pets. It is also limited by having no information on the length of time for which pets have been part of the household. Longitudinal data are required to identify the role of pets in changing health and health service use. We anticipate being able to explore this relationship further as additional waves of the PATH Through Life Project are completed.

Conclusion

Pet ownership conferred no health benefits for community residents in this age group of 60–64 years. Those with pets reported poorer mental and physical health and higher use of pain relief medication. Further, our study suggests that those with pets are less conforming to social norms as indicated by their higher levels on the EPQ-R psychoticism scale.

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