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Assessment of pet attachment and its relationship with stress and social support among residents in Mangalore city of south India

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ABSTRACT

Pets are known to play a supportive role in people's lives. However, their role in helping individuals to cope with stress and in enhancement of their social connectedness needs to be established. This case-control study was performed to compare the stress levels between pet owners and non–pet owners, to correlate the stress levels with the extent of pet attachment and to assess the relationship between pet attachment and social support among pet owners. Data were collected using an interview schedule among urban residents aged more than 12 years. The stress levels, social support, and the extent of pet attachment were assessed using standard questionnaires. A total of 122 pet owners from 108 houses and an equivalent number of non–pet owners from 82 houses took part in this study. The mean perceived stress score among pet owners ($n = 122$) was 24.8 ± 6.7 compared with 23.0 ± 7.0 among non–pet owners ($n = 122$) ($t = 2.064$, $P = 0.04$). The mean pet attachment score among married ($n = 77$) and unmarried/divorced/widow ($n = 42$) pet owners was 49.1 ± 7.7 and 55 ± 8.2, respectively ($t = 3.954$, $P < 0.001$). There was a significant correlation between the time (in hours) spent with the pet in a day and with the pet attachment score ($r = 0.272$, $P = 0.003$). The mean of the emotional component of the social support survey mean score was 3.6 ± 0.8 and 3.8 ± 1.0 among pet owners ($n = 120$) and non–pet owners ($n = 122$), respectively ($t = 2.19$, $P = 0.029$). There was a significant correlation between pet attachment scores and mean of the emotional component of the social support survey scores among pet owners ($r = 0.211$, $P = 0.022$). There was no association between pet/dog ownership status and frequency of morning/evening walks among participants. Pet attachment was greater among participants who were not married. Among pet owners, those with greater pet attachment were found to have higher mean of the mean scores of the emotional component of the social support survey. In other aspects, however, no benefits were associated with pet ownership.

Introduction

Pets play a supportive role in the lives of people. Their presence have been reported to improve coping with stress (Allen and Blascovich, 2002; RSPCA, 2015), lower anxiety levels (Wilson, 1991), lessen depression (RSPCA, 2015; The Health Benefits of Companion Animals, 2018), reduce risk of cardiovascular diseases (Mubanga et al., 2017), lower lipid levels (Anderson et al., 1991), maintain regularity with exercise and healthy eating behavior (Vesnaver and Keller, 2011), improve physiologic parameters such as hypertension (Allen and Blascovich, 2002; Levine et al., 2013), lower heart rate (Allen and Blascovich, 2002), and enhance social connectedness (RSPCA, 2015; The Health Benefits of Companion Animals, 2018). Its presence have been observed to enhance psychosocial and cognitive development, enhance self-esteem and empathy, and result in greater participation in social and physical activities in people of all age groups, including children (Daly and Morton, 2006; Walsh, 2009).

Serpell (1999) suggested that interaction with animals reinforces human values such as responsibility, caring attitude, behavior, and social support.

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However, there are several research studies which have also reported that pet owners were not in any way better or even in certain instances worse than non–pet owners in aspects of health and happiness (Herzog, 2011).

Physiological parameters such as diastolic blood pressure (Parslow and Jorm, 2003; Koivusilta and Ojanlatva, 2006) and body mass index (Parslow and Jorm, 2003; Koivusilta and Ojanlatva, 2006) were reported higher among pet owners. Similarly, elevated cholesterol levels (Koivusilta and Ojanlatva, 2006) and greater risk of heart attacks (Parker et al., 2010) were seen more among pet owners. Even pet owners were reported to have poorer perceived health in several studies (Parslow et al., 2005; Koivusilta and Ojanlatva, 2006).

Presence of such conflicting evidence regarding health benefits associated with pet ownership derived from previous studies prompted investigators to assess the facts in the current setting. This study was therefore performed to assess stress levels among pet and non–pet owners, to correlate the stress levels with extent of pet attachment and to assess the relationship between pet attachment and social support among pet owners. Understanding of how pets might influence health of individuals will be beneficial for public health authorities in translating findings to appropriate policies as suggested by Saunders et al. (2017).

Methods

This case-control study was performed among general population of Mangalore city in the month of April 2018. The institutional ethics committee clearance was obtained before the start of the study. After this, the investigators visited houses in Mangalore and enrolled participants using convenience sampling method. All participants in a household aged more 12 years were eligible to participate. Informed consent was taken in writing from the participants in each household. In case of participants aged more 12 years but below 18 years, assent for their participation was obtained from the participants themselves, and consent for the same was obtained from any of the elders in the household.

Nonconsenting participants, people with phobias toward animals, people who were visitors/nonresidents of the household, and people who were professionally involved in animal care services were excluded from this study. Sample size was calculated using formula 2 (Z alpha + Z beta)$^2\sigma^2/d^2$, Z alpha was taken as 1.96 at 95% confidence levels and Z beta taken as 1.64 at 95% power. “d” which represents the difference in mean emotional stress between pet owners and non–pet owners was taken as 0.27 with reference to a previous study performed by Hinker (2013). “σ” representing the combined standard deviation of emotional stress levels among pet owners and non–pet owners was taken as 0.5. The sample size was rounded off to 100 pet owners and 100 non–pet owners.

The study group or pet owners included people living in the households that have possession of cat(s) or dog(s) as pet(s), for a minimum duration of one month. The control group/non–pet owners included people who have not possessed any pet in the past 10 years (Hinker, 2013).

Data were collected using an interview schedule. The demographic details of each participant such as age, gender, education, occupation, and marital status were inquired. In addition, information on education and occupation of head of the household, total monthly family income, and type of family was collected from each household. The socioeconomic status of each household was assessed using Modified Kuppuswamy’s classification of 2018 (Saleem, 2018).

The stress levels of pet and non-pet owners over the recent one month were assessed using Perceived Stress Scale (Cohen et al., 1983), a 14-item questionnaire designed in a five-point Likert scale format with scores ranging from 0 (never) to 4 (very often). Reverse scoring was performed for negative questions. The total score ranged from 0 to 56. Higher scores indicated greater levels of stress.

The emotional component of social support was assessed using Medical Outcomes Study Social Support Survey (Sherbourne and Stewart, 1991), which is an 8-item questionnaire, designed in a 5-point Likert scale format with scores ranging from 1 (none of the time) to 5 (all of the time). Higher mean scores indicated higher levels of emotional component of social support.

The level of pet attachment was assessed using Lexington Attachment to Pets Scale (LAPS) (Johnson et al., 1992). This questionnaire consisted of a total of 23 items, designed in a 4-point Likert scale format with scores ranging from 0 (strongly disagree) to 3 (strongly agree). Reverse scoring was performed for negative questions. Higher scores indicated stronger pet attachment.

In addition, questions on time spent with the pets in a day, any diseases acquired from the pets in the past one month, vaccination status of the pets, frequency of visits to a doctor, frequency of visits to a veterinary doctor, frequency and duration of morning or evening walk in the past month were also inquired from all the participants.

For calculating years of possession of a pet in houses with multiple pets, the longest time of possession was recorded, and for the time spent with a pet, the longest time spent on average per day with the pets was recorded by the investigators.

The questionnaires were language-validated with help of language experts in the local language Kannada.

Participants who were multiple pet owners were instructed to respond to questions in relation to the pet which was the closest to them (Smolkovic et al., 2012).

The coefficient for internal consistency of the interview schedule used in this study was found to be 0.77 indicating good reliability.

Data were entered and analyzed using SPSS version 17.0. Statistical tests such as the chi-squared test, unpaired t test, analysis of variance, Karl Pearson’s coefficient of correlation were used to test association. *P* value less than 0.05 was taken as statistically significant association.

Results

A total of 190 households were visited by the investigators of this study. This comprised 108 (56.8%) houses with pets. There were a total of 122 pet owners in these houses. Among the pet owners, 72 (59%) were dog owners, 24 (19.7%) were cat owners, and 26 (21.3%) were both dog and cat owners. An equivalent number of non–pet owners (controls) were chosen from 82 houses without pets.

Of the 108 households surveyed with pets, there were 67 (62%) houses with dogs, 16 (14.8%) houses with cats, and 25 (23.2%) houses with both dogs and cats.

Of the 92 houses with dogs, there were 45 (48.9%) houses with one, 29 (31.5%) houses with two, 9 (9.8%) houses with three, 4 (4.3%) houses with 4, 3 (3.3%) houses with 6, and 2 (2.2%) houses with 13 dogs.

Of 41 houses with cats, there were 20 (48.8%) houses with one, 11 (26.8%) houses with two, 6 (14.6%) houses with four, 3 (7.3%) houses with six, and 1 (2.5%) house with eight cats.

Among the 108 households, pets were possessed for a period of less than 5 years in 31 (28.7%) houses, 5.1 to 10 years in 31 (28.7%) houses, 10.1 to 15 years in 22 (20.4%) houses, 15.1 to 20 years in 10 (9.3%) houses, 20.1 to 25 years in 4 (3.7%) houses, 25.1 to 30 years in 5 (4.6%) houses, and more than 30 years in 5 (4.6%) houses. Pets were possessed for a median duration of 10 years (interquartile range, 5-15).

Among sociodemographic variables, only occupational status and type of family were found to significantly vary between pet owners and non–pet owners (Table 1).

The overall mean stress score among all participants was found to be 23.9 ± 6.9.

The mean perceived stress score among pet owners (n = 122) was 24.8 ± 6.7 and among non–pet owners was 23.0 ± 7.0 (n = 122) (t = 2.064, $P = 0.04$). Among the pet owners, the mean perceived stress score among males (n = 57) was 25.3 ± 6.8 compared with 24.4 ± 6.6 among females (n = 65) (t = 0.698, $P = 0.486$). Among the pet owners, the mean perceived stress score among married participants (n = 77) was 24.2 ± 7.1 compared with 25.9 ± 5.8 among unmarried/divorced/widow (n = 45) (t = 1.396, $P = 0.165$). Among the pet owners, the mean perceived stress score among participants from three-generation family (n = 4) was 28 ± 7.6, those from nuclear family (n = 73) was 25.2 ± 6.6, and those from joint families (n = 31) was 25.0 ± 7.1 (F = 0.353, $P = 0.703$). There was no association between mean stress scores with socioeconomic status of the pet owners (n = 37). (F = 0.733, $P = 0.54$). The correlation between number of dogs in the house and perceived stress scores among the pet owners (n = 122) was r = 0.099, $P = 0.279$. The correlation between the number of cats in the house and perceived stress scores among the pet owners (n = 122) was r = 0.055, $P = 0.546$. The correlation between years of possession of pets and perceived stress scores among the pet owners (n = 122) was r = -0.071, $P = 0.439$. The correlation between time spent with pets in a day and perceived stress scores among the pet owners (n = 122) was r = -0.132, $P = 0.153$.

The mean pet attachment score among pet owners was 51.2 ± 8.4. The mean pet attachment score among males (n = 55) was 50.8 ± 7.8 and among females (n = 64) was 51.5 ± 8.9. (t = 0.454, $P = 0.651$). The correlation between the perceived stress score and the pet attachment score among pet owners (n = 122) was r = 0.062, $P = 0.506$. The mean pet attachment score among pet owners who were married (n = 77) was 49.1 ± 7.7 and among pet owners who were unmarried/divorced/widow (n = 42) was 55 ± 8.2 (t = 3.954, $P < 0.001$). There was no association of pet attachment score with occupation status ($P = 0.325$), educational status ($P = 0.103$), and socioeconomic status ($P = 0.692$) of the pet owners. The correlation

Table 1
Sociodemographic distribution of study participants

Characteristics	Pet owners (n = 122)		Non–pet owners (n = 122)		Total (n = 244)	
	No.	Percentage	No.	Percentage	No.	Percentage
Age group (years)						
13-20	26	21.3	17	13.9	43	17.6
21-30	19	15.5	27	22.1	46	18.8
31-40	16	13.1	15	12.3	31	12.7
41-50	25	20.5	23	18.9	48	19.7
51-60	20	16.4	18	14.8	38	15.6
61-70	8	6.6	19	15.6	27	11.1
>70	8	6.6	3	2.4	11	4.5
						$\chi^2 = 4.44$, DF = 5, $P = 0.488$
Gender						
Males	57	46.7	63	51.6	120	49.2
Females	65	53.3	59	48.4	124	50.8
						$\chi^2 = 0.59$, $P = 0.442$
Marital status						
Married	77	63.1	79	64.8	156	64.0
Unmarried	42	34.5	41	33.6	83	34.0
Widow	1	0.8	2	1.6	3	1.2
Divorced	2	1.6	0	0	2	0.8
						$\chi^2 = 0.07$, DF = 1, $P = 0.79$
Educational status	n = 106		n = 119		n = 225	
Illiterate	0	0	1	0.8	1	0.4
Primary school	0	0	1	0.8	1	0.4
Middle school	5	4.7	5	4.2	10	4.4
High school	13	12.3	17	14.3	30	13.4
Preuniversity course	17	16.0	18	15.1	35	15.6
Graduate or postgraduate	62	58.5	68	57.2	130	57.8
Profession	9	8.5	9	7.6	18	8.0
						$\chi^2 = 0.422$, DF = 4, $P = 0.981$
Occupational status	n = 107		n = 112		n = 219	
House wives/students/unemployed	56	52.3	57	50.9	113	51.6
Unskilled	0	0	5	4.5	5	2.3
Semiskilled	4	3.7	7	6.2	11	5.0
Skilled	2	1.9	12	10.7	14	6.4
Clerical/shop owner/farmer	13	12.2	2	1.8	15	6.9
Semiprofession	15	14.0	14	12.5	29	13.2
Profession	17	15.9	15	13.4	32	14.6
						$\chi^2 = 18.9$, DF = 4, $P = 0.001$
Socioeconomic status	n = 37		n = 42		n = 79	
Upper	11	29.7	7	16.7	18	22.8
Upper middle	9	24.3	14	33.3	23	29.1
Lower middle	13	35.2	17	40.5	30	38.0
Upper lower	4	10.8	4	9.5	8	10.1
						$\chi^2 = 2.2$, $P = 0.532$
Type of family	n = 108		n = 115		n = 223	
Nuclear	73	67.6	92	80.0	165	74.0
Joint	31	28.7	21	18.3	52	23.3
Three generation	4	3.7	2	1.7	6	2.7
						$\chi^2 = 4.46$, $P = 0.035$

DF, Degrees of freedom.

Table 2
Association between pet ownership status and frequency of morning/evening walk among participants

Pet ownership status	Frequency of walk				Total
	Daily	Alternate days	Once a week	Absent	
Yes	47 (43.5)	24 (22.2)	11 (10.2)	26 (24.1)	108
No	43 (39.4)	30 (27.5)	10 (9.2)	26 (23.9)	109
				$X^2 = 0.887$, $P = 0.828$	
Total	90	54	21	52	217
	Average duration of walk in a day (minutes)				
	30 or less	31-60	>60		
Yes	44 (54.3)	34 (42.0)	3 (3.7)		81
No	39 (47.0)	41 (49.4)	3 (3.6)		83
				$X^2 = 0.93$, $P = 0.628$	
Total	83	75	6		164

between years since possession of pet with the pet attachment score was found to be r = 0.024, $P = 0.793$. The correlation between time in hours spent with pet on average per day with pet attachment score was found to be r = 0.272, $P = 0.003$.

The mean of the mean score of emotional component of the social support survey was 3.7 ± 0.9.

Mean of the emotional component of the social support survey mean score was 3.6 ± 0.8 among pet owners (n = 120) and was 3.8 ± 1.0 among non–pet owners (n = 122). (t = 2.19, $P = 0.029$).

The mean of the mean emotional component of the social support survey score did not vary significantly between gender ($P = 0.252$), less-educated and well-educated groups ($P = 0.192$), semiprofessional/professional occupation compared with other occupations ($P = 0.42$), socioeconomic status ($P = 0.141$), type of family ($P = 0.764$), and marital status ($P = 0.375$) among the pet owners. There was no correlation between mean emotional component of the social survey scores with the years of possession of pets (r = -0.007, $P = 0.943$). There was also no correlation between the mean emotional component of the social survey scores with the time in hours spent on average per day with the pets (r = 0.132, $P = 0.158$). There was a significant correlation between the pet attachment score and the mean emotional component of the social survey scores among pet owners (n = 120). (r = 0.211, $P = 0.022$).

Of the 122 pet owners, 5 (4.1%) suffered from pet-related diseases over the past one month.

Of the 108 houses with pets, pets were toilet-trained in 82 (75.9%) houses. Care takers for pets were present in 17 (15.7%) houses. Practice of routinely vaccinating the pets was regular in 94, irregular in 9, and not performed at all in 5 houses. Participants in one house stated that the reason for not getting the pets vaccinated was because of the difficultly involved in taking these pets for vaccination. Participants from the other four houses felt that it was not at all necessary for vaccinating pets. Of 108 pet-owning houses, pets were taken for medical examination to veterinary doctors periodically in 59 (54.6%) houses and once in a while in 2 (1.9%) houses. In the rest 47 (43.5%) households, pets were taken for medical examination as and when required only.

There was no association between pet or dog ownership and frequency or duration of morning or evening walk among participants (Tables 2 and 3).

Of the 122 pet owners, 108 responded to the question on whether frequency of hospital visits has changed after possession of pets. Among them, 2 (1.9%) felt that it has increased, 8 (7.4%) felt that it has decreased, 65 (60.1%) felt that it has neither increased nor decreased, and the rest 33 (30.6%) were not sure about the same.

One hundred and ten pet owners responded to the question on whether the frequency of visitors to the house has changed after possession of the pets. Among them, 13 (11.8%) felt that visitor frequency has increased, 5 (4.6%) felt that it has decreased, 88 (80%) felt that it has neither increased nor decreased, whereas the rest 4 (3.6%) were not sure about the same.

When exclusive dog owners (n = 72) were compared with exclusive cat owners (n = 24), there were no significant differences in pet attachment scores ($P = 0.072$), perceived stress scores ($P = 0.54$), and mean of the mean emotional component of the social support scores ($P = 0.424$).

Discussion

In this study, greater proportion of pet owners were employed as semiprofessionals, professionals, or business men, whereas greater proportion of non–pet owners were employed as unskilled, semiskilled, or skilled workers. Greater proportion of pet owners

Table 3
Association between dog ownership status and frequency of morning/evening walk among participants

Dog ownership status	Frequency of walk				Total
	Daily	Alternate days	Once a week	Absent	
Yes	43 (50)	17 (19.8)	7 (8.1)	19 (22.1)	86
No	43 (39.5)	30 (27.5)	10 (9.2)	26 (23.8)	109
				$X^2 = 2.54$, $P = 0.469$	
Total	86	47	17	45	195
	Average duration of walk in a day (minutes)				
	30 or less	31-60	>60		
Yes	34 (51.5)	29 (43.9)	3 (4.6)		66
No	39 (47.0)	41 (49.4)	3 (3.6)		83
				$X^2 = 0.466$, $P = 0.792$	
Total	73	70	6		149

belonged to joint families. These observations were in contrast to previous studies which reported pet owners to be less educated (Parslow and Jorm, 2003), of lower socioeconomic groups (Serpell, 1991), of the age group 35-49 years, more often females and more often self-employed (Mullersdorf et al., 2010).

The mean perceived stress score in the present study was significantly more among pet owners compared with non–pet owners. This observation was again different from the findings of another study performed in Australia, in which, cat owners fared better on psychological health than nonowners (Straede and Gates, 1993). The role of pets in minimizing stress has been attributed to increased parasympathetic and diminished sympathetic activity (Aiba et al., 2012) because of the effects of oxytocin release (Beetz et al., 2012), enhanced levels of endorphins and dopamine, and decreased levels of cortisol among pet owners (Odendaal, 2000). The probable reason for pet owners in the present study reporting higher stress levels might be because of the extra time and energy required on their part toward pet care. Little (2015) suggested that rearing a pet is an additional responsibility, involving activities such as taking it for a walk or feeding or cleaning it. Pet owners therefore may not have sufficient time for themselves and their family resulting in greater perceived stress and strained relationships as observed by Cline (2010). Herzog (2011) also concluded that there is insufficient evidence to support the health benefits associated with pet ownership. Other studies too have reported greater anxiety levels (Mullersdorf et al., 2010) and more episodes of psychological problems such as anxiety, fatigue, lack of sleep, and depression (Mullersdorf et al., 2010), and negative mental health outcomes (Parslow et al., 2005) among pet owners compared with non–pet owners.

In this study, among pet owners, no significant difference in the mean perceived stress scores between males and females and also between married and unmarried participants was observed. On the contrary, another study performed in the United States by Cline (2010) reported that mental health problems such as depression were more in pet-owning men and married persons due to the role enhancement involved in pet care.

Pet attachment score was significantly more among pet owners in our study who were unmarried/divorced/widow compared with those who were currently married, which was similar to the observations of an Australian study performed by Headey (1999). This meant that the attachment with pets strengthens when the loneliness in life deepens. However, another study performed by Zasloff and Kidd (1994) in the United States found no association between loneliness and pet attachment.

There was a significant correlation between pet attachment scores and mean of the emotional component of the social support survey scores among pet owners in this study. This was different from the observation of other studies which either reported no significant correlation (Winefield et al., 2008) or negative correlation, that is, higher the pet attachment indices, fewer were the social networks (Stallones et al., 1990).

Mean value of pet attachment score was significantly higher for female pet owners compared with male pet owners in a Slovenian study performed by Smolkovic et al. (2012). In addition, the same study reported that pet attachment was greater among owners who possessed dogs compared with those with cats (Smolkovic et al., 2012). Although similar observations were made in the present study, the differences were not statistically significant.

There was no significant correlation between years since possession of pet and pet attachment score in this study. On the contrary, the study performed in Slovenia by Smolkovic et al., (2012) reported that owners who had owned their pet for more than 3 years had higher pet attachment scores compared with the rest. In the same study, no significant correlation was found between pet attachment scores and social support scores, which was different from our observations. There was no correlation between scores of perceived stress and pet attachment in this study, as also observed in a study performed by Hinker (2013) in the Netherlands.

Another observation made by Hinker (2013) was that the mean of the emotional component of mental health was significantly more among pet owners compared with non–pet owners. However, the present study could only find a significant correlation between pet attachment scores and the mean emotional component of the social support survey scores among pet owners. This meant that people who were more attached with their pets expressed better social support. Presence of pets has been found to facilitate interaction of its owners with others (Headey, 1999; Mullersdorf et al., 2010; Cline, 2010). McNicholas and Collis (2000) found that walking with the pets resulted in significantly more chance conversations than while walking alone. Similarly, Kirton et al. (2004) observed that children relate better with others by mere presence of animals. This could be the reason why social support was found to increase with pet attachment among pet owners in the present study.

There was no association between pet ownership, or dog ownership in particular, and the frequency and duration of walk among participants in this study. Similarly, a study performed in Australia by Bauman et al. (2001) reported that most dog owners did not walk their dogs and were less likely than nonowners to meet recommended levels of physical activity. However, in other studies, dog owners were found to walk more frequently (Oka and Shibata, 2009), walk longer (Christian et al., 2013), more likely to exercise to the recommended levels (Oka and Shibata, 2009; Mullersdorf et al., 2010), and spend more time engaged in outdoor activities (Mullersdorf et al., 2010).

In this study, most participants felt no change in the frequency of hospital visits after possession of a pet which was similar to the findings of Hinker (2013). This meant that the pet ownership status might not have influenced the occurrences of health problems among participants. However, other studies reported that pet owners were found to report better health and well-being and fewer physician visits, leading to more savings in health care costs (Headey, 1999; Pachana et al., 2005). Such observations suggestive of healthier and wealthier status among pet owners could have been as a result of people with better health and financial status having the capacity and resources to own and maintain pets (Herzog, 2011).

In this study, there were no significant associations of the various studied variables with the status of exclusive dog or cat ownership among participants. This was again different from the findings of Hinker (2013), where dog owners fared better than cat owners and non–pet owners, on the emotional part, but scored lower on the social and mental parts of the assessment.

Conclusion

This study did not establish several well-known benefits associated with pet ownership. However, attachment with pets was significantly more among unmarried/divorced/widow pet owners compared with married pet owners in this study. The strength of pet attachment was also associated with higher emotional component of the social support among pet owners. Pets therefore need to be considered as a mere companion and cannot be confirmed as a complementary or alternative form of therapy in health care. This message should not be taken as discouragement of keeping pets. Rather, we advocate that pets can alleviate isolated lives in people who are unmarried or not currently married.

Limitations

Participants in this study were enrolled using convenience sampling method. There is also a possibility of recall bias among the participants while reporting information. Despite these limitations, the present study should be considered a pioneering study for further longitudinal studies in the current settings to find out the beneficial effects associated with pet ownership.

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Conflict of interest

None.

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