The Journal of Rheumatology 2023;50:842–4
doi:10.3899/jrheum.221164
First Release February 15 2023

The Journal of Rheumatology

Panorama

The Pet-Pain Study: How Caring for a Dog Affects Quality of Life, Pain, and Depression in Patients With Inflammatory Arthritis

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Treatment options for rheumatoid arthritis (RA), spondyloarthritis (SpA) and psoriatic arthritis (PsA) have improved with the introduction of biologic and targeted synthetic disease-modifying antirheumatic drugs. Although a good clinical response and even remission can be achieved in most cases, a low quality of life (QOL), depression, and chronic pain often persist and lead to an increased disease burden.

Surveys have shown that estimated rates of pet owners have increased in the last decades in Germany. In 2019, there was at least 1 dog in approximately 19% and at least 1 cat in 23% of all German households.[1]

Multiple studies describe a positive effect of pets, especially dogs, on mental health. Dunn et al[2] reported a higher life expectancy of patients with pets after cardiovascular events. A current review of the literature on mental health and pet ownership identified mixed influences overall, ranging from positive effects of pet ownership (n = 17), a mixed impact in 19 studies, and no impact in 13 studies, to negative effects on mental health in only 5 studies.[3]

There are no data available about the influence of caring for a pet, especially a dog, on patients with inflammatory arthritis. We hypothesized that caring for a dog could improve QOL and lower depression and pain in patients with inflammatory rheumatic diseases because daily movement likely increases due to frequent dog walks.[4] In a secondary analysis, we compared the scores of dog owners to cat owners and to patients without pets.

One hundred fifty consecutive patients with RA, SpA, and PsA visiting our rheumatology outpatient clinic in Hannover, Germany, from October to December 2021 were included. Patients have given written informed consent for the data processing. This data analysis was approved by the Local Ethics Committee of Hannover Medical School (approval no. 10311_BO_K_2022).

Patients were introduced to the study using a leaflet, which was distributed to all patients with RA, PsA and SpA visiting the outpatient clinic. Individual questions regarding the study protocol and participation were discussed orally. There was no patient or public involvement in the study design.

Patient information was documented in a questionnaire, including age, sex, diagnosis, and answers to 4 questions regarding the pet ownership: (1) Do you have a pet; (2) Which pet(s) and how many; (3) Does the pet have a positive influence on your overall well-being; and (4) Did you already have a pet when your rheumatic disease was diagnosed? In addition, patients answered the 9-item Patient Health Questionnaire (PHQ-9) for assessment of depression and a visual analog scale (VAS) ranking from 0 to 10 for both pain and QOL (0 = no pain/best imaginable QOL, and 10 = worst imaginable pain/worst imaginable QOL). Ankylosing Spondylitis Disease Activity Score (ASDAS) was calculated in patients with SpA and Disease Activity Score in 28 joints (DAS28) based on C-reactive protein (CRP) was calculated in patients with RA. We additionally evaluated CRP levels in all patients who had a follow-up blood test during their outpatient rheumatology visit. Patients who did

Table. Patient characteristics.

	N = 150
Female gender, n (%)	96 (64)
Age, yrs, mean (range)	54 (23-89)
Disease, n (%)	
RA	60 (40)
PsA	39 (26)
SpA	51 (34)
Pet[a], n (%)	57 (38)
Dog	30 (20)
Cat	23 (15)
Cat + dog	3 (2)
Other	5 (3)

Values are expressed as n (%) unless indicated otherwise. [a]"Pet" refers to the number of studied patients with pets, not to the number of pets. "Dog" refers to all patients with at least one dog. "Cat" refers to all patients with at least 1 cat. "Cat + dog" is a subgroup of the patients above with both a cat and a dog. "Other" refers to all patients with only other pets than cats or dogs. PsA: psoriatic arthritis; RA: rheumatoid arthritis; SpA: spondyloarthritis.

not complete the PHQ-9 questionnaire or the pet-related questions were excluded from this analysis.

Data are shown as means and SDs, and statistical test results were interpreted using a 5% level of significance.

Patient characteristics are shown in the Table. Forty percent (60/150) of the patients were diagnosed with RA, 34% (51/150) with SpA and 26% (39/150) with PsA. Overall, 64% (96/150) of our patients were female (75% of the cat owners and 60% of the dog owners). Twenty percent owned at least 1 dog, 15% owned at least 1 cat, and 2% had both a dog and a cat as a pet. Five patients reported they had other animals as pets (rabbits, budgies, fishes, turtles, horses, and guinea pigs). Thirty-six percent of the patients already had a pet when arthritis was diagnosed.

First, we compared all dog owners, including those owning another pet as well, to all patients without dogs. Thirty patients owned a dog, 8 of them had additional pets (cats, horses, rabbits, or guinea pigs). There was no significant difference in the CRP. It was 4.72 (SD 5.53) mg/L (mean and SD) in dog owners and 4.61 (9.73) mg/L in non–dog owners and thus not significantly different (P = 0.30). There was no significant difference in dog owners vs non–dog owners in mean (SD) disease activity measured by DAS28-CRP scores in patients with RA (2.52 [0.94] vs 2.47 [0.81]; P = 0.08) and by ASDAS score in patients with SpA (2.13 [0.71] vs 2.17 [SD 0.65]; P = 0.46).

Seventy-seven percent (44/57) of the patients claimed that their pet had a positive influence on their general well-being. Dog owners reported a significantly (P = 0.002) higher mean (SD) QOL, measured as VAS from 0 to 10, at 3.36 (2.43) than non–dog owners at 4.92 (2.43; Figure 1).

Patients with dogs had numerically lower rates of pain, with a mean VAS pain level of 3.93 vs 4.66 in non–dog owners, which was not statistically significant (P = 0.22). The mean (SD) PHQ-9 score was slightly but statistically nonsignificantly higher in patients without dogs (7.59 [5.45]) compared to dog owners (6.17 [5.45]). Sixty-four percent of all patients had a PHQ-9 score > 5 (consistent with at least 1 minor depressive symptom), with a lower percentage of dog owners (50% vs 68% for non–dog owners) having had a PHQ-9 score > 5.

To study whether the responsibility of caring for an animal may have improved the QOL of dog owners, we next compared dog and cat owners. Only patients with either a cat or a dog but not both a cat and a dog were considered. Mean (SD) levels of CRP were 4.20 (6.31) mg/L in patients with cats, 5.23 (5.23) mg/L in patients with both dogs and cats and 4.91 (5.88) mg/L in patients with dogs, whereas patients with no pets had a mean (SD) CRP of 4.55 (8.66) mg/L. In the patients with RA, mean (SD) DAS28-CRP was similar among the cat owners (2.18 [0.89]), dog owners (2.18 [0.49]), and patients without pets (2.52 [0.78]). In patients with SpA, the results for the ASDAS were also similar among the 3 patient groups.

When we examined QOL among the 3 groups, the mean was 3.00 in dog owners vs 4.81 in controls without pets (P = 0.003) and 5.73 in patients with cats (P < 0.001). Patients who only owned a dog had a lower mean pain at 3.96, as compared to those who only owned cats at 5.38 and 4.53 in patients without pets.

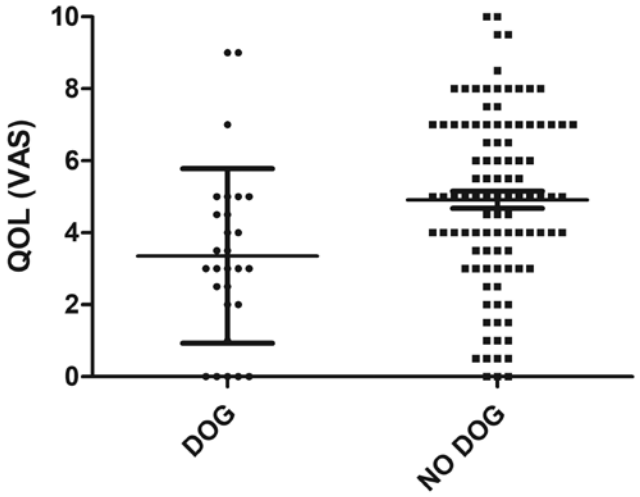

Figure 1. Means and SDs of the QOL, measured by VAS in dog owners vs non–dog owners. QOL: quality of life; VAS: visual analog scale.

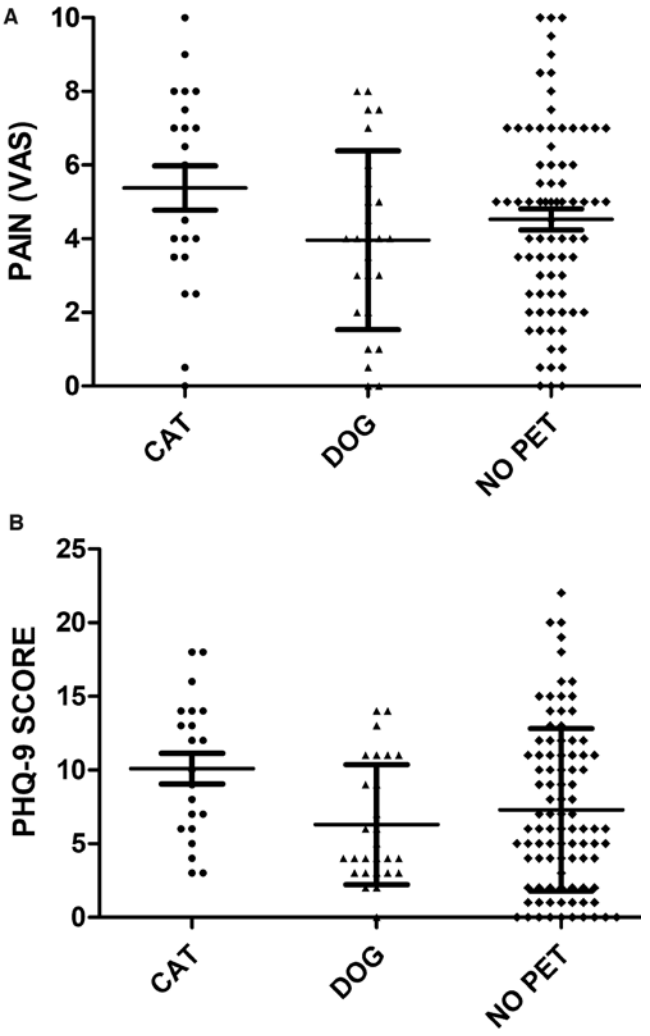

Figure 2. Means with SDs of (A) VAS pain and (B) PHQ-9 scores in patients owning only cats, those owing only dogs, and those with no pets. PHQ-9: 9-item Patient Health Questionnaire; VAS: visual analog scale.

The pain score was significantly lower in dog owners compared to cat owners ($P = 0.04$) but not compared to those without pets (Figure 2A). A lower percentage of dog-only owners (45.5%) had a PHQ-9 score > 5 as compared to 90% of cat-only owners, with the mean (SD) PHQ-9 scores lower for dog-only owners (6.30 [4.07]) compared to 10.10 (4.75) for cat-only owners, but scores did not significantly differ between dog-only owners and non–pet owners (7.30 [SD 5.51]; Figure 2B).

Our data suggest that caring for a dog can improve the overall QOL in patients with inflammatory arthritis. We hypothesized that this could be a consequence of most dog owners, unlike cat-only owners and non–pet owners, possibly having a more active lifestyle as a result of regular, daily dog walks. Physical activity is known to be associated with reduced depressive symptoms,[4] which we found in the dog owners in our study. We did not see any difference between dog owners compared to non–dog owners when looking at measures of disease activity or inflammation. Interestingly, pain and depression were reduced in dog owners in comparison to cat owners but not in comparison to non–pet owners. It remains unclear why the cat owners reported significantly higher pain levels, scored higher in the PHQ-9-score, and had an overall lower QOL.

It is also conceivable that personal dedication to the pet and social interaction with it contribute to the effect seen in our study. Further, dog walks might contribute to more human social interaction as well, which could have an additional impact on the general well-being. The novelty of our data supports the possibility of dog-assisted interventions in the studied patient groups.

One limitation of these data is that we questioned the patients at only 1 random timepoint in their disease history. A further study is already planned to evaluate the effect of having dogs on lowering the risk of chronic pain, depression, and low QOL in the early phases of RA, SpA, and PsA.

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