

## PET OWNERSHIP AMONG THE BRAZILIAN POPULATION, SOCIODEMOGRAPHIC PROFILE, AND DEPRESSION: 2019 NATIONAL HEALTH SURVEY

ANIMAIS DE ESTIMAÇÃO NA POPULAÇÃO BRASILEIRA, PERFIL SOCIODEMOGRÁFICO E DEPRESSÃO: PESQUISA NACIONAL DE SAÚDE 2019

TENENCIA DE ANIMALES DE COMPAÑÍA EN LA POBLACIÓN BRASILEÑA, PERFIL SOCIODEMOGRÁFICO Y DEPRESIÓN: ENCUESTA NACIONAL DE SALUD DE ESCOLARES 2019

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### ABSTRACT

**Objectives:** to identify the socioeconomic profile of pet owners in the Brazilian adult population and to analyze whether pet ownership is associated with a medical diagnosis of depression. **Method:** cross-sectional study using data from the 2019 National Health Survey. The outcome variable was ownership of companion dogs or cats. The primary explanatory variable was a medical diagnosis of depression. The adjustment variables were sex, age group, race/ethnicity, income, place of residence, educational level, and marital status. To assess the association, the prevalence ratio (PR) was used, obtained via Poisson regression with robust variance. **Results:** Of the 88,531 individuals analyzed, 57.99% (95% CI 57.35–58.62%) owned dogs or cats. A medical diagnosis of depression was reported by 10.24% (95% CI 9.86–10.63%). Lower prevalence of pet ownership were observed among individuals aged 60 years or older (51.08%, 95% CI 49.90–52.26%), those who self-identified as Black (54.16%, 95% CI 52.52–55.79%), with an income above three minimum wages (50.47%, 95% CI 48.60–52.34%), and among those who reported having completed higher education (52.44%, 95% CI 50.87–54.01%). In contrast, higher prevalence were observed among rural residents (74.32%, 95% CI 73.05–75.55%), single or separated individuals (59.22%, 95% CI 58.27–60.17%), and among those who reported a medical diagnosis of depression (60.73%, 95% CI 58.60–62.82%), even after adjusting for sociodemographic variables (OR 1.06; 95% CI 1.01–1.11). **Conclusion:** Pet ownership in Brazil is associated with sociodemographic factors and mental health and may complement the treatment of depression. **Keywords:** Pets; Depression; Epidemiological Surveys; Public Health; Cross-sectional Studies; Brazil.

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### RESUMO

**Objetivos:** identificar o perfil socioeconômico das pessoas com posse de animais de estimação na população adulta brasileira e analisar se a posse desses animais está associada ao diagnóstico médico de depressão. **Método:** estudo transversal com dados da Pesquisa Nacional de Saúde de 2019. A variável de desfecho foi a posse de cães ou gatos na residência. A variável explicativa principal foi o diagnóstico médico de depressão. As variáveis de ajuste foram sexo, faixa etária, raça/cor, renda, local de moradia, escolaridade e estado civil. Para verificar a associação, utilizou-se a razão de prevalência (RP), obtida por meio de regressão de Poisson com variância robusta. **Resultados:** dos 88.531 indivíduos analisados, 57,99% (IC95% 57,35–58,62%) possuíam cães ou gatos. O diagnóstico médico de depressão foi relatado por 10,24% (IC95% 9,86–10,63%). Observaram-se menores prevalências de posse desses animais entre indivíduos com 60 anos ou mais (51,08%, IC95% 49,90–52,26%), de cor da pele autodeclarada preta (54,16%, IC95% 52,52–55,79%), com renda acima de três salários mínimos (50,47%, IC95% 48,60–52,34%) e entre aqueles que relataram ensino superior completo (52,44%, IC95% 50,87–54,01%). Em contrapartida, constatarem-se maiores prevalências entre os residentes da zona rural (74,32%, IC95% 73,05–75,55%), indivíduos solteiros ou separados (59,22%, IC95% 58,27–60,17%) e naqueles que relataram diagnóstico médico de depressão (60,73%, IC95% 58,60–62,82%), mesmo após o ajuste pelas variáveis sociodemográficas (RP 1,06; IC95% 1,01–1,11). **Conclusão:** a posse de animais no Brasil está associada a fatores sociodemográficos e à saúde mental, podendo complementar o tratamento da depressão.

**Palavras-chave:** Animais de Estimação; Depressão; Inquéritos Epidemiológicos; Saúde Pública; Estudos Transversais; Brasil.

### RESUMEN

**Objetivo:** identificar el perfil socioeconómico de las personas que poseen mascotas en la población adulta brasileña y analizar si la tenencia de estos animales está asociada con el diagnóstico médico de depresión. **Método:** estudio transversal utilizando datos de la Encuesta Nacional de Salud de 2019. La variable de resultado fue la tenencia de perros o gatos en el hogar. La principal variable explicativa fue el diagnóstico médico de depresión. Las variables de ajuste incluyeron sexo, grupo de edad, raza/color, ingresos, lugar de residencia, nivel educativo y estado civil. Para verificar la asociación, se utilizó la razón de prevalencia (RP), obtenida mediante regresión de Poisson con varianza robusta. **Resultados:** de los 88.531 individuos analizados, el 57.99% (IC95% 57.35–58.62%) poseían perros o gatos. El diagnóstico médico de depresión fue reportado por el 10.24% (IC95% 9.86–10.63%). Se observaron menores prevalencias de tenencia de estos animales entre individuos de 60 años o más (51.08%, IC95% 49.90–52.26%), de piel autodeclarada negra (54.16%, IC95% 52.52–55.79%), con ingresos superiores a tres salarios mínimos (50.47%, IC95% 48.60–52.34%) y entre aquellos que reportaron educación superior completa (52.44%, IC95% 50.87–54.01%). Por el contrario, se constataron mayores prevalencias entre los residentes de zonas rurales (74.32%, IC95% 73.05–75.55%), individuos solteros o separados (59.22%, IC95% 58.27–60.17%) y aquellos que reportaron un diagnóstico

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médico de depresión (60.73%, IC95% 58.60–62.82%), incluso después del ajuste por variables sociodemográficas (RP 1.06; IC95% 1.01–1.11). **Conclusión:** la tenencia de animales en Brasil está asociada con factores sociodemográficos y de salud mental, pudiendo complementar el tratamiento de la depresión.

**Palabras clave:** Mascotas; Depresión; Encuestas Epidemiológicas; Salud Pública; Estudios Transversales; Brasil.

## INTRODUCTION

The presence of companion dogs and cats is a common phenomenon in Brazil<sup>(1)</sup> and around the world<sup>(2)</sup>. Commonly known as “pets” - a term of English origin that refers to animals that are domesticated or treated with affection<sup>(3)</sup> - these animals are acquired for a variety of reasons. Among the most frequently cited are the desire for companionship, the formation of emotional bonds, a connection with nature, and participation in recreational and work-related activities, besides the benefits related to well-being and mental health<sup>(4)</sup>.

Although the findings concerning the mental health benefits of these animals vary, many studies suggest that their presence can have a positive impact on individuals' psychological well-being. Some research indicates a reduced sense of loneliness<sup>(5)</sup>, greater perceived social support, and lower levels of depressive symptoms among pet owners<sup>(6)</sup>. In addition, exposure to these animals during childhood has been associated with a lower future risk of mental health diagnoses, such as schizophrenia and bipolar disorder<sup>(7)</sup>.

Among mental health disorders, depression stands out as a serious chronic illness with a high prevalence in Brazil and worldwide. According to the World Health Organization, it ranks fourth among the leading causes of health decline. It could rise to first place when considering the cumulative duration of disability over the years. Although the late thirties are the most common age range for its onset, depression can manifest at any age<sup>(8)</sup>. Non-pharmacological treatments include psychotherapy, physical activity, changes in dietary habits, and even the presence of animals for emotional support or as part of animal-assisted therapy, which can also help interrupt suicidal thoughts and prevent suicide<sup>(9)</sup>.

Some studies have found a higher prevalence of pet ownership among women, employed individuals<sup>(10)</sup>, residents of rural areas, parents, individuals with lower levels of education<sup>(10,11)</sup>, White individuals<sup>(11,12)</sup>, middle-aged individuals, and married individuals<sup>(12)</sup>. Type of residence, maternal education level, and the number of household members were also associated with pet ownership<sup>(13)</sup>. However, these characteristics vary by country and type of animal.

To date, no studies representative of the Brazilian population have examined the possible relationship between pet ownership and associated factors, such as depression. Understanding the prevalence of pets - especially dogs and cats - in Brazilian households can provide important insights for developing public health policies, particularly regarding human-animal health and the formulation of mental health intervention strategies. An analysis of pet owners' characteristics can inform the planning of initiatives focused on animal health and its impact on human health, such as vaccination, the control of common diseases, and other essential care. Given this, the objectives of this study were to identify the socioeconomic profile of pet owners among adults in Brazil and to analyze whether pet ownership is associated with a medical diagnosis of depression.

## METHODS

This is an analytical cross-sectional study conducted using data from the 2019 National Health Survey (PNS). The PNS is a household-based survey conducted by the Ministry of Health in partnership with the Brazilian Institute of Geography and Statistics (IBGE) in 2013 and 2019. The survey focuses on three main areas of data collection: the performance of the Unified Health System (SUS), the health status of the population, and the surveillance of diseases, health conditions, and associated risk factors<sup>(14)</sup>.

The National Health Survey (PNS) uses a three-stage cluster sampling design, with census tracts, households, and residents aged 15 years or older as the sampling units. In the 2019 survey, the individuals were randomly selected from the household roster<sup>(14)</sup>. The study population comprised participants in the 2019 PNS who resided in private permanent households in Brazil<sup>(14)</sup>. According to the survey's sampling design, areas classified by the Brazilian Institute of Geography and Statistics (IBGE) as having special characteristics were excluded from the study. These included military barracks and bases, dormitories, camps, areas with low housing standards, Indigenous communities, correctional facilities, long-term care facilities for older adults, integrated child and adolescent care units, convents, hospitals, agricultural villages in rural settlement projects, and ‘quilombola’ communities<sup>(14)</sup>.

The sample size calculation regarded estimated averages, variances, and a 20% nonresponse rate. Post-stratification weights were applied to account for nonresponse and calibrate the estimates to the population totals. Further details are available elsewhere<sup>(14)</sup>.

## Variables

The outcome variable was dog or cat ownership, obtained from the Household Information module (A) of the survey. Participants were asked, “Do you have any pets in your household?” Responses were classified as “yes” or “no,” and the numbers of dogs and cats were recorded through the follow-up questions, “How many of these animals are dogs?” and “How many of these animals are cats?” The primary independent variable was a self-reported medical diagnosis of depression, obtained from the Chronic Diseases module (Q) using the question, “Has a doctor or mental health professional (such as a psychiatrist or psychologist) ever diagnosed you with depression?” Responses were dichotomized as “yes” or “no.”

In addition, we analyzed several sociodemographic variables, including age group (18 to 24 years, 25 to 39 years, 40 to 59 years, and 60 years or older), race/ethnicity (White, mixed-race, Black, and others [Asian and Indigenous]), sex (female and male), income (up to 1 minimum wage, 1 to 3 minimum wages, and more than 3 minimum wages), place of residence (urban and rural areas), and number of rooms in the home (up to 3, 3 to 6, and more than 6). We also analyzed perceived health status (good/very good, fair, and poor/very poor), educational attainment (no schooling and incomplete elementary school; complete elementary school and incomplete high school; complete high school and incomplete college; and complete college), and marital status (single/separated, widowed, and married).

## Data Analysis

The analysis included individuals aged 15 years or older who were selected for the individual module of the 2019 PNS and had complete data for all variables of interest. Participants with missing or inconsistent data for any of the analyzed variables were excluded.

The prevalence and confidence interval for all variables were calculated. To characterize the profile of pet owners, the prevalence of pet ownership was calculated using socioeconomic variables and the corresponding crude prevalence ratio.

To examine the association between depression and pet ownership, we calculated the crude (CPR) and adjusted (APR) prevalence ratios by sex, age group, marital status, income, race/ethnicity, educational level, and place of residence, using a Poisson regression model with robust variance. The significance level adopted was  $p < 0.05$ .

All data were analyzed using Software for Statistics and Data Science (STATA), version 14.0.

The 2019 National Health Survey (PNS) was approved by the Brazilian National Research Ethics Commission (CONEP) under Opinion No. 3,529,376 (2019). Participation was voluntary, and the confidentiality of participants' information was ensured. The 2019 PNS dataset and survey questionnaires are publicly available through the official PNS website.

## RESULTS

The sample comprised 108,525 households, of which 94,114 were successfully interviewed. For this study, 88,531 adults aged 18 years or older were included in the analysis. Most participants were female, aged 40–59 years, lived in urban areas, and reported a monthly income of up to one minimum wage. More than half reported having dogs or cats in their households, and approximately one in ten reported a medical diagnosis of depression (Table 1).

Table 2 presents the profile of individuals who owned dogs or cats. Lower prevalences of dog or cat ownership were observed among adults aged 60 years or older (51.08%; 95% CI: 49.90–52.26%), those who self-identified as Black (54.16%; 95% CI: 52.52–55.79%), individuals with a monthly income above three minimum wages (50.47%; 95% CI: 48.60–52.34%), and those who had completed higher education (52.44%; 95% CI: 50.87–54.01%). Lower prevalences were also observed among widowed (53.04%; 95% CI: 51.13–55.93%) and married individuals (53.88%; 95% CI: 51.81–55.93%). In contrast, the highest prevalence of dog or cat ownership was found among individuals living in rural areas (74.32%; 95% CI: 73.05–75.55%) (Table 2).

Among adults who reported owning dogs or cats, the prevalence of depression was 60.73% (95% CI 58.61–62.82). A positive association was found between depression and pet ownership (APR 1.06; 95% CI 1.01–1.11), even after adjusting for sociodemographic variables (Table 3).

## DISCUSSION

According to the study findings, approximately six in ten Brazilian households have dogs or cats. The distribution of dog or cat ownership varied according to socioeconomic and health characteristics. Lower prevalence rates of pet ownership were observed among older adults, Black and Brown individuals, those with a monthly income

Table 1 - Sample Characteristics, PNS 2019.

| Variable                                              | % (CI 95%)          |
|-------------------------------------------------------|---------------------|
| <b>Age (years)</b>                                    |                     |
| 18–24                                                 | 13,87 (13,36–14,39) |
| 25–39                                                 | 29,23 (28,64–29,81) |
| 40–59                                                 | 35,30 (34,71–35,89) |
| ≥ 60                                                  | 21,61 (21,08–22,16) |
| <b>Sex</b>                                            |                     |
| Masculine                                             | 46,84 (46,24–47,44) |
| Feminine                                              | 53,16 (52,56–53,76) |
| <b>Race/collor</b>                                    |                     |
| White                                                 | 43,26 (42,55–43,98) |
| Brown                                                 | 43,80 (43,12–44,49) |
| Black                                                 | 11,47 (11,07–11,89) |
| Others (Asian/Indigenous)                             | 1,46 (1,31–1,63)    |
| <b>Income (minimum wage)</b>                          |                     |
| < 1                                                   | 51,22 (50,41–52,03) |
| 1–3                                                   | 37,26 (36,59–37,94) |
| > 3                                                   | 11,52 (10,93–12,13) |
| <b>Place of residence</b>                             |                     |
| Urban                                                 | 86,18 (85,78–86,56) |
| Rural                                                 | 13,82 (13,44–14,22) |
| <b>Schooling</b>                                      |                     |
| No education and incomplete elementary school         | 34,76 (34,10–35,42) |
| Complete elementary school and incomplete high school | 14,48 (14,06–14,91) |
| Complete high school and incomplete college           | 34,94 (34,33–35,55) |
| Complete college                                      | 15,83 (15,19–16,48) |
| <b>Marital Status</b>                                 |                     |
| Single/Separated                                      | 75,17 (74,50–75,82) |
| Widower/widow                                         | 12,21 (11,74–12,70) |
| Married                                               | 12,62 (12,14–13,11) |
| <b>Pets</b>                                           |                     |
| No                                                    | 42,01 (41,38–42,65) |
| Yes                                                   | 57,99 (57,35–58,62) |
| <b>Depression Diagnosed by a Doctor</b>               |                     |
| No                                                    | 89,76 (89,37–90,14) |
| Yes                                                   | 10,24 (9,86–10,63)  |

Source: Prepared by the authors using data from the PNS, 2019.

Table 2 – Characteristics of Adults Who Own Dogs or Cats, PNS, 2019.

| Variables                                             | % (CI 95%)          | CPR (CI 95%)     | p*    |
|-------------------------------------------------------|---------------------|------------------|-------|
| Total                                                 |                     |                  |       |
| Age (years)                                           |                     |                  | 0,000 |
| 18–24                                                 | 61.86 (59.91–63.77) | 1                |       |
| 25–39                                                 | 57.10 (56.05–58.15) | 0,92 (0,89–0,96) |       |
| 40–59                                                 | 61.43 (60.47–62.37) | 0,99 (0,96–1,03) |       |
| 60 years old or over                                  | 51.08 (49.90–52.26) | 0,82 (0,79–0,86) |       |
| Sex                                                   |                     |                  | 0,805 |
| Masculine                                             | 57.91 (56.99–58.82) | 1                |       |
| Feminine                                              | 58.06 (57.21–58.90) | 1,00 (0,98–1,02) |       |
| Race/collor                                           |                     |                  | 0,000 |
| White                                                 | 58.34 (57.31–59.36) | 1                |       |
| Brown                                                 | 58.53 (57.68–59.38) | 1,00 (0,98–1,02) |       |
| Black                                                 | 54.16 (52.52–55.79) | 0,93 (0,90–0,96) |       |
| Others (Asian/Indigenous)                             | 61.13 (56.16–65.87) | 1,04 (0,96–1,14) |       |
| Income (minimum wage)                                 |                     |                  | 0,000 |
| < 1                                                   | 60.11 (59.25–60.96) | 1                |       |
| 1–3                                                   | 57.41 (56.33–58.48) | 0,95 (0,93–0,98) |       |
| > 3                                                   | 50.47 (48.60–52.34) | 0,83 (0,81–0,87) |       |
| Local of residence                                    |                     |                  | 0,000 |
| Urban                                                 | 55.37 (54.65–56.08) | 1                |       |
| Rural                                                 | 74.32 (73.05–75.55) | 1,34 (1,31–1,37) |       |
| Schooling                                             |                     |                  | 0,000 |
| No education or incomplete elementary school          | 59.62 (58.63–60.60) | 1                |       |
| Complete elementary school and incomplete high school | 58.13 (56.62–59.61) | 0,97 (0,95–1,00) |       |
| Complete high school and incomplete college           | 58.82 (57.78–59.85) | 0,99 (0,96–1,01) |       |
| Complete college                                      | 52.44 (50.87–54.01) | 0,88 (0,85–0,91) |       |
| Marital status                                        |                     |                  | 0,000 |
| Single/separated                                      | 59.22 (58.27–60.17) | 1                |       |
| Widower/widow                                         | 53.04 (51.13–55.93) | 0,89 (0,86–0,93) |       |
| Married                                               | 53.88 (51.81–55.93) | 0,91 (0,87–0,95) |       |

\* Chi-square test

Source: Prepared by the authors using data from the PNS, 2019.

Table 3 - Adults who own dogs or cats and have a medical diagnosis of depression, PNS, 2019.

| Variable                | % (CI 95%)          | CPR (CI 95%)      | APR (CI 95%)       |
|-------------------------|---------------------|-------------------|--------------------|
| Diagnosis of depression |                     |                   |                    |
| No                      | 57,67 (56,99–58,36) |                   |                    |
| Yes                     | 60,73 (58,61–62,82) | 1,053 (1,01–1,09) | 1,06 (1,01 – 1,10) |

Source: Prepared by the authors using data from the PNS, 2019.

above three minimum wages, and individuals with a college degree. In contrast, higher prevalence rates were found among individuals living in rural areas. In addition, individuals with a medical diagnosis of depression were more likely to report possessing companion dogs or cats.

Similar prevalence rates for the presence of these pets were found in a national study based on IBGE data (59.3%), and in international studies, such as those in New Zealand (61.6%)<sup>(10)</sup> and the United States (60.9%)<sup>(12)</sup>, which, although they investigated the presence of pets in general, found that dogs and cats made up the majority of the animals. The highest prevalence was found in Ethiopia (65.1%)<sup>(15)</sup>, and the lowest in European countries, such as Portugal (39% for dogs and 33% for cats) and Spain (27% for dogs and 17% for cats)<sup>(16)</sup>. These differences may be related to the reasons for keeping pets at home - such as protecting the home in developing countries<sup>(15)</sup> - and to the demographic and socioeconomic profile of the population itself.

A lower prevalence of dog or cat ownership among older adults has been previously identified<sup>(10)</sup>. This finding may be associated with financial considerations, since responsibly caring for a pet can be costly and the socioeconomic situation in retirement may be unfavorable. In addition, pet ownership has been associated with better health outcomes among the elderly population, including improved cognition and physical function<sup>(17)</sup>, as well as subjective benefits, such as reduced loneliness and increased socialization<sup>(5)</sup>.

Differences in pet ownership according to race/ethnicity have also been reported in other countries, where Black individuals and those from other racial or ethnic groups are less likely to own pets than self-identified White individuals<sup>(11)</sup>. Socioeconomic factors may partly explain these disparities. Race/ethnicity is often used as a proxy for socioeconomic status, and Black populations frequently experience less favorable employment opportunities, lower income, and poorer housing conditions<sup>(18)</sup>. These socioeconomic disadvantages may limit the financial resources required to own and care for a companion animal.

Individuals with household incomes above three minimum wages and higher educational attainment were less likely to own dogs or cats. One possible explanation is that these individuals tend to spend more time engaged in paid work outside the home<sup>(19)</sup>, which may reduce the time available to care for companion animals. However, the evidence is inconsistent. A study conducted in the United States found no significant association between income and pet ownership<sup>(11)</sup>, suggesting that the

relationship may vary across populations or study designs. Moreover, the socioeconomic context of the household alone may not adequately explain pet ownership, as other factors, such as lifestyle, housing characteristics, cultural preferences, and family composition, may also influence the decision to own companion animals<sup>(13)</sup>.

The higher prevalence of dog or cat ownership in rural areas is consistent with previous studies<sup>(10,11)</sup>. This finding may reflect several factors. Rural residents may have less access to information on responsible pet ownership, as well as fewer public policies and spay/neuter programs targeting companion animal population control. In addition, rural households - typically located on larger residential properties, smallholdings, or farms - generally have more outdoor space, facilitating the keeping of companion animals<sup>(20)</sup>. Dogs, in particular, may also be kept to protect the household or property<sup>(15)</sup>.

One study indicated a higher prevalence of dog or cat ownership among single people<sup>(21)</sup>. Pet ownership was also associated with a way to avoid loneliness and boost self-esteem and, as a result, with a reduction in symptoms of anxiety and depression.

In the present study, individuals who reported a medical diagnosis of depression were more likely to own dogs or cats. The relationship between pet ownership and human health has been widely investigated, with evidence suggesting both short- and long-term benefits. However, findings remain inconsistent, particularly regarding mental health outcomes and depression. Some studies have shown that activities involving companion animals, such as walking a dog, promote social interaction and may contribute to the prevention or management of depression<sup>(22)</sup>. In addition, companion animals may provide emotional support, comfort, and a greater sense of security<sup>(15)</sup>. Supporting these potential benefits, one study found that individuals without pets reported more symptoms of anxiety than those who owned dogs, cats, or both<sup>(21)</sup>.

However, a stronger attachment to a companion animal has also been associated with lower levels of trust in others, greater fear of rejection, and concerns about not being loved, characteristics that have been linked to poorer mental health outcomes<sup>(23)</sup>, including anxiety<sup>(21)</sup>. In addition, some studies have reported lower quality of life and higher levels of loneliness and perceived stress among pet owners<sup>(24)</sup>. These inconsistent findings may reflect methodological differences, variations in study design, or differences in the populations studied. Given the increasing prevalence of companion animal ownership

worldwide<sup>(1,2)</sup>, further research is needed to clarify its relationship with mental health and well-being.

The cross-sectional design precludes causal inference and does not allow the temporal relationship between pet ownership and depression to be established. Consequently, it is not possible to determine whether pet ownership preceded the diagnosis of depression or whether individuals acquired a companion animal after receiving the diagnosis. Pet ownership may be associated with increased psychological burden due to caregiving responsibilities, concerns about the animal's health or death, and other aspects of care. Conversely, individuals may acquire a companion animal after a diagnosis of depression in search of potential therapeutic benefits, such as reduced depressive symptoms, increased social interaction, greater physical activity, or emotional support, although stronger attachment to the animal has also been associated with greater social isolation in some cases<sup>(25)</sup>.

This study has some limitations. First, the sample was restricted to individuals living in private households, which may have led to an underestimation of the prevalence of depression by excluding vulnerable populations, such as people experiencing homelessness, displaced persons, incarcerated individuals, and hospitalized patients. In addition, the findings should be interpreted in the context of inequalities in access to mental health services, which may influence the likelihood of receiving a diagnosis of depression.

To our knowledge, this is the first nationally representative study to investigate the profile of dog and cat owners in Brazil and its association with depression. By using a nationally representative sample encompassing diverse geographic and socioeconomic settings, this study provides valuable insights into the epidemiology of pet ownership in the country. Nevertheless, the relationship between companion animal ownership and depression warrants further investigation, particularly to clarify the nature and direction of the observed association.

## CONCLUSION

More than half of the Brazilian population owned at least one dog or cat. Pet ownership was associated with socioeconomic characteristics and a medical diagnosis of depression. Lower prevalence of pet ownership was observed among older adults and individuals with higher income, whereas higher prevalence was found among residents of rural areas, those living in larger households, and individuals with a diagnosis of depression. These findings may help inform public policies and interventions

aimed at promoting both human and animal well-being. Further longitudinal studies are needed to clarify the temporal relationship between pet ownership and depression and to better understand the mechanisms underlying this association.

## REFERENCES

1. Oliveira FM, Tavela AO, Wagner KJP Associação entre fatores socioeconômicos e demográficos e vacinação antirrábica de cães e gatos domésticos. *Cad Saúde Colet* [Internet]. 2023 [cited 2025 Jan 15];31(2). Available from: <https://doi.org/10.1590/1414-462X202331020063>
2. Chijiwa H, Takagi S, Hagihara H, Kanakogi Y. Exploring dog and cat cohabitation within Japanese households. *Sci Rep* [Internet]. 2025 [cited 2025 Feb 09];15:16965. Available from: <https://doi.org/10.1038/s41598-025-01401-8>
3. Varner GE. In nature's interests? Environmental ethics and science policy. Oxford: Oxford University Press; 2002. 154 p.
4. Scoresby KJ, Strand EB, Ng Z, Brown KC, Stiltz CR, Strobel K, et al. Pet ownership and quality of life: a systematic review of the literature. *Vet Sci* [Internet]. 2021 Dec 16 [cited 2025 Jan 15];8(12):332. Available from: <https://www.mdpi.com/2306-7381/8/12/332>
5. Stanley IH, Conwell Y, Bowen C, Van Orden KA. Pet ownership may attenuate loneliness among older adult primary care patients who live alone. *Aging Ment Health* [Internet]. 2014 Apr 3 [cited 2025 Jan 15];18(3):394-9. Available from: <https://www.tandfonline.com/doi/full/10.1080/13607863.2013.837147>
6. Martin F, Bachert KE, Snow L, Tu HW, Belahbib J, Lyn SA. Depression, anxiety, and happiness in dog owners and potential dog owners during the COVID-19 pandemic in the United States. *PLoS One* [Internet]. 2021 Dec 15 [cited 2025 Jan 15];16(12):e0260676. Available from: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0260676>
7. Yolken R, Stallings C, Origoni A, Katsafanas E, Sweeney K, Squire A, Dickerson F. Exposure to household pet cats and dogs in childhood and risk of subsequent diagnosis of schizophrenia or bipolar disorder. *PLoS One* [Internet]. 2019 Dec 2 [cited 2025 Jan 15];14(12):e0225320. Available from: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0225320>
8. Ministério da Saúde (BR). Depressão [Internet]. Brasília: Ministério da Saúde; [sem data] [cited 2025 Feb 09]. Available from: <https://www.gov.br/saude/pt-br/assuntos/saude-de-a-a-z/d/depressao>
9. Shoib S, Hussaini SS, Chandradasa M, Saeed F, Khan T, Swed S, Lengvenyte A. Role of pets and animal assisted therapy in suicide prevention. *Ann Med Surg (Lond)* [Internet]. 2022 Jul 31 [cited 2025 Feb 09];80:104153. Available from: <https://pmc.ncbi.nlm.nih.gov/articles/PMC9422226/>
10. Fraser G, Huang Y, Robinson K, Wilson MS, Bulbulia J, Sibley CG. New Zealand pet owners' demographic characteristics, personality, and health and wellbeing: more than just a fluff piece. *Anthrozoos* [Internet]. 2020 Jul 3 [cited 2025 Feb 09];33(4):561-78. Available from: <https://www.tandfonline.com/doi/abs/10.1080/08927936.2020.1771060>

11. Mueller MK, King EK, Callina K, Dowling-Guyer S, McCobb E. Demographic and contextual factors as moderators of the relationship between pet ownership and health. *Health Psychol Behav Med* [Internet]. 2021 Jan 1 [cited 2025 Feb 09];9(1):701-23. Available from: <https://pubmed.ncbi.nlm.nih.gov/34395058/>
12. Applebaum JW, Peek CW, Zsembik BA. Examining U.S. pet ownership using the Gen Social Survey. *Soc Sci J* [Internet]. 2023 [cited 2025 Feb 09];60(1):110-9. Available from: <https://doi.org/10.1080/03623319.2020.1728507>
13. Purewal R, Christley R, Kordas K, Joinson C, Meints K, Gee N, et al. Socio-demographic factors associated with pet ownership amongst adolescents from a UK birth cohort. *BMC Vet Res* [Internet]. 2019 Sep 18 [cited 2025 Feb 09];15(1). Available from: <https://pubmed.ncbi.nlm.nih.gov/31533719/>
14. Instituto Brasileiro de Geografia e Estatística (IBGE). Pesquisa Nacional de Saúde: 2019: percepção do estado de saúde, estilos de vida, doenças crônicas e saúde bucal: Brasil e grandes regiões. Rio de Janeiro: IBGE; 2020.
15. Gebremedhin EZ, Sarba EJ, Getaneh AM, Tola GK, Endale SS, Marami LM. Demography and determinants of dog and cat ownership in three towns of West Shoa zone, Oromia Region, Ethiopia. *BMC Vet Res* [Internet]. 2020 Dec 10 [cited 2025 Feb 09];16(1):481. Available from: <https://pmc.ncbi.nlm.nih.gov/articles/PMC7730736/>
16. Fédération Européenne de l'Industrie des Aliments pour Animaux Familiers (FEDIAF). Facts & Figures 2023: Annual Report. Bruxelles: FEDIAF; 2023.
17. Friedmann E, Gee NR, Simonsick EM, Studenski S, Resnick B, Barr E, et al. Pet ownership patterns and successful aging outcomes in community-dwelling older adults. *Front Vet Sci* [Internet]. 2020 Jun 25 [cited 2025 Feb 09];7:293. Available from: <https://pubmed.ncbi.nlm.nih.gov/32671105/>
18. Ferreira ACM, Silva AG, Sá ACMGN, Oliveira PPV, Felisbino-Mendes MS, Pereira CA, et al. Fatores de risco e proteção para as doenças crônicas não transmissíveis entre escolares brasileiros: pesquisa Nacional de Saúde do Escolar 2015 e 2019. *REME Rev Min Enferm* [Internet]. 2022 [cited 2025 Feb 09];26:e451. Available from: <https://periodicos.ufmg.br/index.php/reme/article/view/38620>
19. Murray JK, Browne WJ, Roberts MA, Whitmarsh A, Gruffydd-Jones TJ. Number and ownership profiles of cats and dogs in the UK. *Vet Rec* [Internet]. 2010 Feb 6 [cited 2025 Feb 09];166(6):163-8. Available from: <https://pubmed.ncbi.nlm.nih.gov/20139379/>
20. Menezes SS, Almeida MG, Deus JAS. Novos usos do espaço rural e suas resiliências: transformações e ruralidades em Goiás, Minas Gerais e Sergipe. Aracaju: Criação Editora; 2020. (eBook). Disponível em: <https://grupam-ufrs.com.br/livros-e-e-books/>
21. Gonzatti V, Oliveira CR, Alminhana LO, Hausen DO, Schütz DM, Costa DB, et al. Personality factors, depression, anxiety, and stress in pet owners. *Psico* [Internet]. 2021 Dec 31 [cited 2025 Feb 09];52(4):e35289. Available from: <https://lume.ufrgs.br/handle/10183/282058>
22. McNicholas J, Collis GM. Dogs as catalysts for social interactions: robustness of the effect. *Br J Psychol* [Internet]. 2000 Feb 24 [cited 2025 Feb 09];91(1):61-70. Available from: <https://pubmed.ncbi.nlm.nih.gov/10717771/>
23. Lass-Hennemann J, Schäfer SK, Sopp MR, Michael T. The relationship between attachment to pets and mental health: the shared link via attachment to humans. *BMC Psychiatry* [Internet]. 2022 Dec 1 [cited 2025 Feb 09];22(1). Available from: <https://pubmed.ncbi.nlm.nih.gov/36057711/>
24. Amiot CE, Gagné C, Bastian B. Pet ownership and psychological well-being during the COVID-19 pandemic. *Sci Rep* [Internet]. 2022 Apr 12 [cited 2025 Feb 09];12:6091. Available from: <https://www.nature.com/articles/s41598-022-10019-z#citeas>
25. Merkouri A, Graham TM, O'Haire ME, Purewal R, Westgarth C. Dogs and the good life: a cross-sectional study of the association between the dog-owner relationship and owner mental wellbeing. *Front Psychol* [Internet]. 2022 Jul 18 [cited 2025 Feb 09];13:903647. Available from: <https://pmc.ncbi.nlm.nih.gov/articles/PMC9341998/>