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Demographics and health care profiles of dogs and cats associated with the socioeconomic profile of their tutors in areas assisted by Family Health Strategies in Brazil

[*Perfis demográficos e assistenciais de cães e gatos associados ao perfil socioeconômico de seus tutores em áreas atendidas por Estratégias de Saúde da Família no Brasil*]

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ABSTRACT

This study aimed to evaluate the demographic and healthcare situation of dogs and cats owned by families assisted by the Family Health Strategy (FHS), from Santa Maria/RS, Brazil. This research was a cross-sectional and population-based study developed by applying a questionnaire to residents in the 16 FHS areas of the city. This was the first study addressing pet animal conditions in the FHS area. A total of 414 households were studied, and 88.5% of them had pets (dogs and/or cats), with an average of 2.2 dogs and 0.8 cats per household. Only 18.4% (228/1.241) of the animals were sterilized (dogs, 15.1% [135/891]; cats, 26.7% [93/348]). When considering the number of dogs, households with one resident had fewer dogs than households with two or more residents (p=0.006). The level of education and family income were not associated with the number of animals (p>0.001). However, higher levels of education and family income were associated with the sterilization of dogs, veterinary monitoring, vaccination, and treatment of ectoparasites in dogs and cats (p<0.0001). Additionally, the higher family income was associated with a higher frequency of endoparasite treatment (p<0.05). The study shows a high average number of pets per household in FSH areas compared to the average household population as well as a lack of veterinary care, making it essential to promote responsible custody.

Keywords: demographic of dogs, levels of education, responsible custody, Family Health System, Public Health

RESUMO

Este estudo teve como objetivo avaliar a situação demográfica e de saúde de cães e gatos pertencentes a famílias assistidas pela Estratégia de Saúde da Família (ESF), de Santa Maria/RS, Brasil. Esta pesquisa foi um estudo transversal baseado na população adscrita, desenvolvido por meio da aplicação de questionário aos residentes das 16 áreas de ESF da cidade. Este foi o primeiro estudo que abordou as condições dos animais de estimação na área de ESF. Foram estudados 414 domicílios, e 88,5% deles tinham animais de estimação (cães e/ou gatos), com uma média de 2,2 cães e 0,8 gatos por domicílio. Apenas 18,4% (228/1,241) dos animais foram esterilizados (cães, 15,1% [135/891]; gatos, 26,7% [93/348]). Ao considerar o número de cães, os lares com um residente tinham menos cães que os lares com dois ou mais residentes (p=0,006). O nível de educação e a renda familiar não estavam associados ao número de animais (p>0,001). Entretanto, níveis mais altos de educação e renda familiar foram associados com a esterilização de cães, monitoramento veterinário, vacinação e tratamento de ectoparasitas em cães e gatos (p<0,0001). Adicionalmente, a maior renda familiar foi associada a uma maior freqüência de tratamento endoparasitário (p<0,05). O estudo mostra um alto número médio de animais de estimação por domicílio nas áreas de ESF em comparação com a população domiciliar média, bem como uma falta de cuidados veterinários, tornando essencial promover a custódia responsável.

Palavras-chave: demografia de cães, níveis de educação, custódia responsável, Sistema de Saúde da Família, Saúde Pública

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INTRODUCTION

Interaction with pets is related to several benefits to the physical and psychological health of humans (Macpherson, 2005)). However, pets can be at risk to their well-being and can also pose risks to humans, depending on how these companion animals are cared for and handled (Garcia et al., 2012). The lack of public policies related to responsible ownership can lead to countless consequences for animals, such as abandonment in urban s and the occurrence of chronic diseases (Macpherson, 2005). According to the Brazilian National Health Survey, the population of dogs and cats in households is around 52.2 and 22.1 million respectively in the country, overlapping the population of children up to the age of 14 years (near 44.9 million) (Pesquisa…, 2015b). The exponential increase in pets is a global and local concern with a direct impact on public health, as it can determine the risk of transmission of infectious diseases to humans. (Guidelines…, 1992).

Particularly in the context of emerging and reemerging infectious diseases, interdisciplinary cooperative efforts are driving the "One Health" movement (Coker *et al*., 2011; Paige *et al*., 2015; Webster *et al*., 2016). This movement advocates a policy that involves human and veterinary medicine, promoting collaborative and investigative actions that help to assess, treat, and prevent disease transmission between species. In addition, it encourages the discussion of strategies that enhance collaboration between these two sciences in medical education, clinical care, public health, and biomedical research (One…, 2007).

The Unified Health System (UHS) is recognized by the World Health Organization (WHO) as the world's largest free and universal public health system (Gragnolati *et al*., 2013). This system is constituted by the Estratégia de Saúde da Família (ESF) (Primary Health Care) and supported by Núcleo Ampliado de Saúde da Família (NASF) (Expanded Health Care Center) through the work of multiprofessional teams composed of different health professionals, including veterinarians, who were added to the team in 2011 (Brasil, 2011; Marqui *et al*., 2010).

Therefore, the aim of this study was to determine the demographic and veterinary care profiles of dogs and cats associated with the socioeconomic profile of tutors in areas assisted by ESF.

MATERIAL AND METHODS

The target population of this study was families using the Brazilian Unified Health System (SUS) and living in areas assisted by FHS in Santa Maria municipality, RS state, Brazil. Santa Maria has a population of 261,031, being characterized as the 5th most populous municipality in RS state and has a territorial area of 1,781,754 km². The economy is based on trade and public services, especially due to the Universidade Federal de Santa Maria (Federal University of Santa Maria) and Brazilian Military Forces bases (Estimativas…, 2015). Santa Maria presents a human development index (HDI) of 0.845, which is above the national HDI (0.754) and RS state HDI (0.815) values. However, most families assisted by ESF live in poverty (Medina and Hartz, 2009).

The target population of the study was families using the ESF and residents of areas assisted by ESF. All 16 ESF assistance areas in the Santa Maria municipality were studied, totaling 24.631 individuals in 8.357 assisted families. The size of the sample in each ESF area was determined based on a randomized stratified sampling with a 90% confidence interval, according to the number of families that were registered in each ESF as available in the CONSULFARMA software (Health and Social Information and Management System used by the Federal Government). Therefore, the numbers of interviews performed per ESF area were: Alto da Boa Vista (28/571); Arroio do Só (15/313); Bela União (11/223); Lídia (20/408); Vitor Hoffmann (59/1229); São João (20/408); Maringá 19 (34/706); Urlândia 20 (21/432); São Serafim (26/540); São José 15 (28/578); São José 16 (28/574); Roberto Binato 12 (25/521); Roberto Binato 13 (15/299); Santo Antão (15/310), and Santos (45/928)..

A questionnaire (Sup.1) was used to guide the interviews. Each household was visited with the health agents. Participants who agreed to be interviewed signed a free and informed consent form, guaranteeing the right to nonparticipation and confidentiality regarding the identity of the participants. The interviews were conducted by four interviewers who were trained to ask questions. Participants were asked to respond voluntarily to the research questions, and one resident per household was interviewed, preferably the family provider.

The questionnaire was structured with closed questions, containing the following information: a) Socioeconomic profile of the respondents: age (≤18 years, 19–29, 29–39, 39–49, 49–59, >60 years), residence income based on Brazil's monthly minimum wage (MW) of R$ 954,00 (USD $295.05) ((≤1 MW, 1–2 MW, 2–3 MW, ≥3 MW), education of the respondents (no study, elementary, high school, technical and higher education), number and age of the residents in the household; b) Population survey of dogs and cats; c) Responsible ownership: way of breeding and veterinary care profile of dogs and cats.

The different variables of the data obtained during the interviews were tabulated using Excel software. Normality was tested using the Shapiro–Wilk and Kolmogorov–Smirnov tests. ANOVA and Tukey’s tests were used to compare income, education, and number of animals. Other analyses were performed by comparing frequencies using the chi-square test. Differences were considered statistically significant at $p < 0.05$. All tests were performed using SAS software (SAS Institute, 2011).

RESULTS

A total of 85.5% (354/414) of the families had pets. Dogs were present in 80.4% (333/414) and cats in 37.9% (157/414) of these households. The average number of people in residence was 3.3, while the number of animals was 3.0 (2.2 dogs and 0.8 cats). Considering only households with pets, 55.6% (197/354) had only dogs, 38.4% (136/354) dogs and cats, and 6% (21/354) only cats.

Households with one resident had fewer dogs ($p<0.01$) than households with two or more residents. Similarly, households with one or two inhabitants had fewer cats than those with three or four residents.

There was no significant association ($p > 0.1$) between the number of animals (dogs and/or cats) and the family that had elderly people (>60 years old) and children (≤18 years old), the level of education of the respondents, and family income (Table 1).

Considering all households (414 families) sampled, the number of dogs was 907 (males, 51% [463/907]; females, 49% [443/907]). The number of cats was 341 (males, 42.2% [144/341]; females, 57.8% [197/341]). There was no difference between the sexes of the animals ($p > 0.05$).

The mean ages of the animals were 5.3 and 3.1 years for dogs and cats, respectively. Considering dogs and cats, only 18.4% (228/1.248) of the animals were sterilized. In dogs, 15% (135/907) were sterilized, and females were significantly more sterilized than males ($p<0.0001$). Meanwhile, 27.3% of cats (93/341) were sterilized;with no difference between the sexes (Table 2).

When comparing the places where the animals lived and circulated, 38.3% (346/903) of the dogs were kept in the yard, being higher ($p < 0.05$) than the other categories. The number of dogs in chains (13.2%; 119/903) was lower than in the category mentioned above ($p < 0.0001$).

However, there was a significant difference between the number of animals that only lived inside the house (7.5%; 68/903) and other categories, and those that were semi-domiciled (3.4%; 31/903) ($p < 0.0001$). Regarding cats, the number of animals that had access to the street (66.8%; 231/346) was significantly higher when compared to the other categories (free in the yard, yard and house, inside the house only, street access only to walk, and chained) ($p < 0.0001$) (Table 2).

Most of the dogs (63.9%; 579/907) and cats (75.6%; 260/344) had never received veterinary assistance ($p<0.0001$) (Table 2). Most of the dogs received endoparasiticidal and ectoparasiticidal treatment, which is significantly different from those who received it sporadically or those who did not receive it at all. A different situation was observed for cats, as only 20.4% (69/338) of them were periodically treated with endoparasiticides different from cats ($p<0.0001$) that were treated sporadically (48.8%; 165/338) and from those who did not receive treatment (30.8%; 104/338).

Approximately half of the animals (50.1%; 171/341) received periodic ectoparasitic treatment, and 40.2% (137/341) received it sporadically, which differed (p<0.0001) from 9.7% (33/341) that did not receive this kind of treatment (Table 2).

Regarding vaccination, 66.4% (601/905) of the dogs were vaccinated, whereas non-vaccinated cats prevailed (71.7%; 248/346) (p < 0.0001). Of the vaccinated dogs, 43.6% (255/601) received two types of vaccines (polyvalent and rabies) and 37.9% (222/601) were vaccinated for rabies. The two categories cited differed (p<0.0001) from 18.5% (108/601) who were vaccinated only with the polyvalent vaccine.

Among the vaccinated cats, 32.6% (30/98) received the anti-rabies vaccine, and 26.1% (24/98) received the polyvalent vaccine. However, the percentage of cats receiving the two types of vaccines was higher (41.3%; 38/92; p < 0.0001). Regarding the frequency of vaccinations, for both animals, the polyvalent vaccine was administered significantly more at birth (72%; 248/344 dogs and 82%; 50/61 cats) (p<0.0001), whereas the rabies vaccine was administered once a year (94.4%; 405/429 dogs and 100% cats) (p<0.0001). Regarding the location or period in which the vaccination took place, most dogs were vaccinated during vaccination campaigns (48.5%; 356/734) (p<0.0001); however, in cats, the vaccination performed in veterinary clinics was predominant (48%; 49/102) compared to other locations (p<0.021). Furthermore, there were no statistical differences in the comparison between the locations where vaccination took place (Table 2).

Table 1. Socioeconomic profile of the families and number of dogs and cats per household in areas assisted by the Family Health Strategies (FHS) in Santa Maria municipality, RS state, Brazil

Variables				
Number of people living in the residence	Mean	SD[1]	Mean	SD[1]
1	1.70	3.42	0.61	1.43
2	1.98	1.84	0.79	1.97
3–4	2.18	1.91	0.95	1.48
5 or more	2.86	2.70	0.88	1.79
Presence of children				
Yes	2.28	2.52	0.89	1.81
No	2.13	1.96	0.82	1.47
Presence of elderly				
Yes	2.24	1.92	0.76	1.36
No	2.20	2.61	0.95	1.91
Respondent's education level				
No instruction	2.44	2.55	0.63	1.55
Elementary school	2.02	1.97	0.75	1.32
High school	2.38	2.19	0.96	1.86
Technical or higher education	2.75	2.65	1.37	2.74
Family income				
≤1 minimum wage[2]	2.41	2.43	0.73	1.38
1–2 minimum wages	2.03	2.04	0.99	1.64
2–3 minimum wages	2.56	2.85	0.69	1.53
≥3 minimum wages	2.03	2.02	0.86	1.89

[1]SD, standard deviation; [2]minimum wages, R$ 954,00 (USD $295.05).

Table 2. Biological, nutritional, health, and prophylactic characteristics of dogs and cats surveyed in Family Health Strategy areas

Variables	N of dogs (%)[1] N = 907	N of cats (%)[1] N = 341
Sex		
Female	443/907 (49%)	197/341 (57.8%)
Male	463/907 (51%)	144/341 (42.2%)
Age		
<1 year old	90/680 (13.2%)	37/282 (13,1%)
1–4 years old	253/680 (37.2%)	176/282 (62.4%)
4–10 years old	263/680 (38.7%)	63/282 (22.3%)
>10 years old	74/680 (10.9%)	6/282 (2.1%)
Feeding		
Dog/cat food	197/899 (22%)	140/341 (41%)
Prepared food	38/899 (4.2%)	8/341 (2.3%)
Leftover food	83/899 (9.2%)	25/341 (7.3%)
Dog/cat food, prepared food, and leftover food	547/899 (60.8%)	168/341 (49.3%)
Prepared food and leftover food	34/899 (3.8%)	6/341 (1.8%)
Sterilization of animals		
Yes	135/903 (15%)	93/348 (27%)
No	768/903 (85%)	255/348 (73%)
Sterilization of female	92/443 (20.8%)	56/197 (28.4%)
Sterilization of male	43/462 (9.3%)	37/144 (25.7%)
Place where the animals live		
Only inside the house	68/903 (7.5%)	32/346 (9.2%)
House and yard	181/903 (20.1%)	47/346 (13.6%)
Free in the yard	346/903 (38.3%)	19/346 (5.5%)
Chained in the yard	119/903 (13.2%)	0 (0%)
Free access to the street	158/903 (17.5%)	231/346 (66.8%)
Street access for a walking tour only	31/903 (3.4%)	17/346 (4.9%)
The animals received veterinarian assistance		
Yes	296/907 (32.6%)	69/344 (20%)
No	579/907 (63.9%)	260/344 (75.6%)
Periodically	32/907 (3.5%)	15/344 (4.4%)
Treatment for ectoparasites in the last 12 months		
Yes	214/901 (23.7%)	137/341 (40.2%)
No	161/901 (17.9%)	33/341 (9.7%)
Periodically	526/901 (58.4%)	171/341 (50.1%)
Treatment for endoparasites in the last 12 months		
Yes	198/899 (22%)	165/338 (48.8%)
No	156/899 (17.4%)	104/338 (30.8%)
Periodically	545/899 (60.6%)	69/338 (20.4%)
Vaccination		
Yes	601/905 (66.4%)	98/346 (28.3%)
No	304/905 (33.6%)	248/346 (71.7%)
Vaccines administered		
Rabie	222/585 (37.9%)	30/92 (32.6%)
Polyvalent	108/585 (18.5%)	24/92 (26.1%)
Rabie virus and polyvalent	255/585 (43.6%)	38/92 (41.3%)
Frequency of rabies vaccination		
Only in the year of birth	24/429 (5.6%)	0/64 (0%)
Once a year	405/429 (94.4%)	64/64 (100%)
Frequency of polyvalent vaccination		
Only in the year of birth	248/344 (72%)	50/61 (82%)
Once a year	96/344 (28%)	11/61 (18%)
Where the vaccination was carried out		
Agricultural store	100/734 (13.6%)	11/102 (10.8%)
Vaccination campaigns	356/734 (48.5%)	33/102 (32.4%)
Veterinary clinic	194/734 (26.4%)	49/102 (48%)
At home	84/734 (11.5%)	9/102 (8.8%)

[1]Totals may differ depending on missing data.

Most of the dogs were fed dog food and leftovers (60.8%; 547/899) ($p<0.0001$); 22% (197/899) of the dogs received only dog food, which was significantly higher than those who received only leftovers (9.2%; 83/899) ($p<0.0001$). The number of animals receiving prepared food, such as cornflour-based meals, was lower (4.2%; 38/899) than that in the categories mentioned above ($p < 0.0001$). Regarding the feeding of cats, 49.3% (168/341) received cat food and leftovers, and 41% (140/341) received cat food only. There was no significant difference between them ($p < 0.05$); however, they differed from the other categories (leftover food, prepared foods) ($p < 0.0001$) (Table 2).

From the association of the education level of those interviewed with the sterilization of dogs, it can be observed that the higher the level of education, the greater the number of sterilized animals ($p = 0.004$). Meanwhile, in cats, the number of sterilized animals was not associated with the education level of the respondents ($p>0.05$). Families with an income >2 MW (USD $295.05) had the surgical procedure performed more frequently in dogs and cats than in families with an income <1 MW ($p<0.05$). Tutors with a higher level of education offered exclusively dog/cat food more frequently (dogs, $p=0.0003$; cats, $p = 0.0209$), as well as tutors with a higher income ($p<0.0001$). Regarding the monitoring and treatment of animals, respondents with a higher level of education and higher income took more dogs ($p=0.0003$ and $p=0.0037$, respectively) and cats ($p=0.0469$ and $p=0.0469$, respectively) to the vet for healthcare.

Education level was not associated with the administration of endoparasiticides to dogs and cats ($p>0.05$); however, income influenced the frequency of dosage for animals ($p<0.05$). A higher education level influenced the treatment of ectoparasites in dogs ($p=0.0346$) and cats ($p=0.0139$) and was more frequent in families receiving >3 MW for dogs ($p=0.0157$) and cats ($p=0.0408$). The animals that were vaccinated most frequently were associated with the respondent having a higher level of education and a higher income ($p < 0.0001$) (Table 2).

DISCUSSION

ESF is a national program that aims to allow or expand the access of the poor population to primary health care services in Brazilian municipalities, prioritizing the promotion, protection, and health of individuals and their families. Working in selected geographical areas with restricted traffic, each ESF team can receive a maximum of 4.000 people, with 3.000 being the recommended average, and this number may be lower depending on the risk and social vulnerability of the assisted population (Brasil, 2011).

ESF and NASF - AB teams are not complete in some municipalities of Brazil, as in the case of Santa Maria municipality in the state of Rio Grande do Sul (RS), where veterinarians are not included. The inclusion of these professionals is necessary to promote responsible custody and prevent diseases in animals and zoonoses, strengthening preventive medicine in the UHS.

In the municipality of Santa Maria, in areas assisted by ESF, 85.5% of the households had pets, with an average of 3.0 pets (2.2 dogs and 0.8 cats) per household. In contrast to another study carried out in a municipality in the southern region of the state, all census tracts were sampled, and the average number of animals presented per household was 1.4 (Domingues *et al*., 2013). According to the 2010 Brazilian census (Instituto Brasileiro de Geografia e Estatística, 2010), the average number of people per residence was 3.3. However, the average habitant:animal (1:0.9) is far beyond the recommendation of eight inhabitants for each animal (8:1), proposed by the Fundação Nacional de Saúde (National Health Foundation) (Brazil, 2002), and the recommendation of seven inhabitants for each animal (7:1) proposed by the WHO for emerging countries (Guidelines…, 1992).

In addition to being lower than estimates from the WHO for developing countries, human:dog ratios vary greatly between different areas of the country (3:1–13:1 for owned dogs) (Alves *et al*., 2005; Dias *et al*., 2004; Serafini *et al*., 2008). The same variation has been observed between different populations of owned cats (7:1–86:1 for owned cats); however, fewer studies have been conducted in these cats than in dogs (Dias *et al*., 2004). Various demographic and socioeconomic characteristics of the human population in different regions are likely to be associated with and influence the number of owned dogs and cats. However, the proportion presented in this study was the largest ever described in the consulted literature.

Our study has also shown a greater preference for users to breed dogs (80.4%) rather than cats (37.9%), consistent with other studies in Brazil (Dias *et al*., 2004; Martins *et al*., 2013). These findings contrast with those of developed countries, which reported similar distributions of dogs and cats, with 25% of households with dogs and 17% with cats in the United Kingdom (Food, 2017), and 44% of households with dogs and 35% of households with cats in the USA (American…, 2016).

Households with one person own fewer dogs than households with two or more people. There was no significant association between the number of animals (dogs and/or cats) and whether the family consisted of more children (from 1 to 14 years) or the elderly (people over 60 years of age). In developed countries such as Australia (Baldock *et al*., 2003), England (Murray *et al*., 2010; Westgarth *et al*., 2010), and Ireland (Downes *et al*., 2009), families with children are more likely to have pets. Regarding the elderly, the results differ from other studies conducted in Brazil, which reported that the elderly (>60 years) had more animals compared to other age groups (Martins *et al*., 2013).

There were no significant differences in the number of dogs and cats when comparing the different levels of education of the respondents and the family income categories of the households. Therefore, we have verified that the socioeconomic factors in this study are not correlated with the ratios of humans:dog and humans:cat. These results are consistent with another study conducted in Paraná state, Brazil, where it was shown that families with higher income were more likely to have dogs (but not cats) compared to low-income families. This is contrary to the consensus that the lower the family income, the greater the number of animals (Martins *et al*., 2013).

The mean age of dogs and cats was 5.3 and 3.1 years, respectively, which is consistent with a study conducted in São Paulo that presented an average age of 4.99 years for dogs and 3.53 years for cats (Canatto *et al*., 2012). However, Garcia *et al*. (2018) found a mean age of 3.36 years and 1.66 yers for dogs and cats in São Paulo, respectively. The large population of young animals may indicate a high rate of population renewal. This can be attributed to a lack of adequate health care, which correlates directly with the absence of responsible care (Fielding *et al*., 2012). Another variable that may have contributed to the low average age of the animals was that 17.5% (158/903) of the dogs and 66.8% (231/346) of the cats had access to the street.

Once more cats in this study had access to the street (66.4%), they were not immunized against common feline infectious diseases (71.7%) and may come into contact with different animals, which favors the maintenance and spread of infectious agents in the population, contributing to the shorter life expectancy of these animals (Trapp *et al*., 2015. The population of dogs and cats that move through the streets presents greater risks to the population in the transmission of zoonoses, causing injuries due to accidents (involving automobiles, for example) and aggressive behavior (to other animals and humans) (Lord *et al*., 2007).

It was observed that 63.9% of the dogs and 75.6% of the cats did not receive veterinarian care in the last 12 months. The small percentage of animals that received veterinarian care in the last 12 months could be associated with the low education level, and the low income of the population interviewed, according to the study by Domingues *et al*. (2013) and Silva *et al*. (2010), which were conducted in Pelotas and Campinas-Ribeirão Preto, Brazil. Only 3.5% (32/907) of the dogs and 4.4% (15/344) of the cats received veterinary assistance periodically, in contrast to those reported in Italy by Slater *et al*. (2008), where 79% of the dogs received veterinary assistance at least once a year.

Most dogs (82.6%; 743/899) and cats (69.2%; 234/338) received endoparasiticidal treatment, which indicated that the respondents considered that the practice of endoparasiticidal treatment is important for their pets. This management could be facilitated by free access to endoparasiticides, low cost, and unrestricted commercialization in agricultural stores and pet shops, which are usually located near homes. However, recent studies point to the need for coproparasitological evaluation before and after anthelmintic treatments (D'ambroso Fernandes *et al*., 2022).

The control of ectoparasites was performed in 82.1% (740/901) of the dogs, in 90.3% (308/341) of the cats. Additionally, 58.4% and 50.1% of the dogs and cats, respectively, received periodic treatment for ectoparasites. These results are similar to those observed by Domingues *et al*. (2013) in a study conducted in the city of Pelotas, which evaluated responsible pet guarding in an urban area, were 78.7% (722/918) perform treatment for ectoparasites, in the environment, in animals, or associated.

The percentage of vaccinated dogs and cats was 66.4% (601/905) and 28.3% (98/346), respectively. Approximately 80% of canines have received rabies vaccination. Great attention to the rabies virus can be justified because the disease has a fatal prognosis in humans and animals in almost 100% of cases and represents a serious public health problem (Seis Acha and Szyfres, 2003).

The polyvalent vaccine was administered less frequently in dogs (62.1%; 363/585) and cats (67.4%; 62/92). This may be associated with the lack of information on the population in relation to vaccine protocols, which corroborates the high prevalence of infectious diseases (Lima *et al*., 2010). In addition, the polyvalent vaccine is expensive and not offered in campaigns, which limits the purchasing power of the population (Suhett *et al*., 2013).

Regarding the period when dog vaccination occurred, 48.5% (356/734) of the vaccines were administered during vaccination campaigns. This is believed to have occurred because, in most of the country, the annual immunization of dogs against rabies has become a voluntary initiative or, in some cases, can be carried out by non-governmental organizations (Fernandes *et al*., 2017).

Studies carried out in Brazil did not find a statistical difference when comparing the level of education of the respondents with the practice of rabies vaccination. (Suhett *et al*., 2013).

CONCLUSION

The study shows a high average of pets per household in ESF areas compared to the average population of families; from the association of the interviewees' education, it can be observed that the higher the education, the greater the number of spayed dogs as well as the greater frequency of the procedure in families with >2 MW (US$ 295.05) in dogs and cats. In addition, there is a lack of veterinary care for animals in the homes evaluated, and these could be better if there was guidance from veterinarians for this population.

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