



Evaluation of Post-Pandemic Behavioral Problems in Two Dog Populations Using the C-BARQ Test in Two Veterinary Clinics in Samborondón, Ecuador

Evaluación de problemas de conducta pospandémicos en dos poblaciones caninas mediante el test C-BARQ en dos clínicas veterinarias de Samborondón, Ecuador

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Abstract

The COVID-19 pandemic, declared a public health emergency by the World Health Organization (WHO) on January 30, 2020, imposed mobility and socialization restrictions in several countries, affecting the daily lives of millions of people. As a result of these restrictions, many people spent more time in their homes, leading to an exponential increase in pet adoption rates. In addition, dogs already living with their guardians experienced an increase in the frequency of interaction, such as playtime, petting and short walks. This significantly changed the daily routines of the animals and led to

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changes in the lifestyles of the guardians, who adapted their care practices.

Keywords: C-BARQ, dogs, ethology, pandemic, behavior

Resumen

La pandemia de COVID-19, declarada como emergencia de salud pública por la Organización Mundial de la Salud (OMS) el 30 de enero de 2020, impuso restricciones de movilidad y socialización en varios países, lo que afectó la vida cotidiana de millones de personas. Como resultado de estas restricciones, muchas personas pasaron más tiempo en sus hogares, lo que condujo a un aumento exponencial en los índices de adopción de mascotas. Además, los perros que ya convivían con sus tutores experimentaron un aumento en la frecuencia de interacción, como tiempo de juego, caricias y paseos cortos. Esto modificó considerablemente las rutinas diarias de los animales y generó cambios en los estilos de vida de los tutores, quienes adaptaron sus prácticas de cuidado.

Keywords: C-BARQ, perros, etología, pandemia, comportamiento

Introduction

In the months following the onset of the pandemic, a notable increase in cases of behavioral problems in dogs, such as aggression, fear, stress and anxiety, was observed during ethological consultations in Samborondón canton. Several studies have documented that factors influencing behavioral changes in dogs include lack of socialization with other humans and animals, as well as deficiencies in the education guidelines received (Feddersen-Petersen, 2021; Sargisson et al., 2022).

In this context, the need arose to record the most frequent behavioral problems in two groups of dogs with different socialization periods: one that experienced its socialization before 2019 and another that

experienced it in 2020, considering that, at the time of the research, both groups were between 3 and 4 years of age. In addition, the perceived emotional closeness between guardians and their pets was assessed using the Monash scale, to identify possible correlations between the type of socialization and the observed behavioral problems.

Methodology

For the evaluation of behavioral problems in dogs, a reduced version of the C-BARQ questionnaire, translated into Spanish, was used, which consists of five sections: aggressiveness, fear and anxiety, separation-related behaviors, attachment, and demand for attention. This questionnaire was answered by 111 pet guardians, who provided information about their dogs' behavior (Garcia-Artica, 2019; Serpell, 2023).

The second questionnaire used was aimed at evaluating the emotional closeness perceived by the guardian towards his or her pet. This instrument consisted of nine items and, like the first one, used the Likert scale to measure the responses. The questionnaire was adapted from the Monash scale on the guardian-dog relationship, in its Mexican version (González-Ramírez, 2017, pp. 107-123), the Argentine version (Carballo et al., 2021, pp. 7-11) and the modified version by Díaz-Videla (2017).

In addition, general demographic questions about the pets, such as sex, reproductive status, breed, and age of the guardian, were included. Guardians in the pandemic-affected population were asked about the type of household in which they resided (house with yard, house without yard, apartment), family type (family with children, family without children, or single), and whether they experienced any loss of a family member during the pandemic.

Finally, we proceeded to relate the aforementioned demographic variables, including whether the pet was adopted during the pandemic or before the pandemic ("pandemic dog" or "pre-

pandemic"), to the observed behavioral problems and the perceived emotional closeness of the guardian

Results

Table 1 shows the results of the C-BARQ with the evaluated populations (A and B) on the relationship between the type of aggressiveness towards unknown persons, family members, known and unknown dogs. A significant relationship was found in the variable of aggressiveness towards unknown dogs: population A showed 50% low, 25% medium and 25% high aggressiveness; population B showed considerable high aggressiveness with 36%, medium 38% and low 25%.

Table 1. Relationship of the type of aggressiveness, towards unknown persons, towards persons in the house, towards unknown dogs, and towards unknown dogs with the population.

Variable	Variable stratum	Population A	%	Population B	%	Significance
Aggressiveness towards strangers	Under	36	64 %	31	56 %	0.69
	Medium	15	27 %	18	33 %	
	High	5	9 %	6	11 %	
Aggressiveness towards household members	Under	54	96 %	52	95 %	0.67
	Medium	2	4 %	3	5 %	
	High	0	0 %	2	0 %	
Aggressiveness towards unknown dogs	Under	28	50 %	14	25 %	0.02*
	Medium	14	25 %	21	38 %	
	High	14	25 %	20	36 %	

Aggressiveness towards known dogs	Under	41	73 %	35	64 %	0.31
	Medium	8	14 %	7	13 %	
	High	7	13 %	13	24 %	

*Indicates significant difference $p \leq 0.05$

Source: Palacios, I.

A significant relationship was found between fear of unfamiliar dogs and the different populations (Table 2). Population A presented a low level with 88 %, medium 13 % and 0 % for a high level. On the contrary, the dogs of population B presented a high level of 15 %, 24 % medium and 62 % low. It should be noted that both populations presented the highest values in terms of a low level of fear towards people in the house. Population A obtained 91 % of low level, 5 % medium and 0 % high, likewise population B obtained 82 % of high level, 13 % medium and 5 % low.

Table 2. Relationship of the type of fear, towards unknown people, towards new objects or situations, towards unknown dogs and towards people at home with the type of population.

Variable	Variable stratum	Population A	%	Population B	%	Significance
Fear of strangers	Under	45	80 %	44	80 %	0.59
	Medium	11	20 %	10	18 %	
	High	0	0 %	1	2 %	
	Under	18	32 %	21	38 %	0.8
	Medium	28	50 %	25	45 %	

Fear of new objects or situations	High	10	18 %	9	16 %	
	Under	49	88 %	34	62 %	
Fear of unfamiliar dogs	Medium	7	13 %	13	24 %	0.002*
	High	0	0 %	8	15 %	
	Under	51	91 %	45	82 %	
Fear of people in the house	Medium	5	9 %	7	13 %	0.15
	High	0	0 %	3	5 %	
	Under	51	91 %	45	82 %	

*Indicates significant difference $p \leq 0.05$

Source: Palacios, I.

Table 3 shows that there is a significant relationship between the behaviors related to separation, attachment and demand for attention and hunting behavior in the different populations. In for the highest level of separation-related behavior there is no difference between the two populations (9 % for both), but population B had a much higher average level (38 %) compared to population A (9 %). Regarding the low level of this behavior: 82 % of population A and 53 % of population B. Regarding behaviors describing an attachment and a demand for attention from the dog, population A obtained 50 % low, 25 % medium and 25 % high; population B 13 % low, 45 % medium and 42 % high. The greatest difference observed was in hunting behavior, population A presented a 77 % low, 5 % medium and 18 % high level. In contrast, population B obtained 22 % low, 45 % medium and 33 % high.

Table 3. Relationship between separation-related behaviors, attachment and attention demand, hunting behavior, and population type.

Variable	Variable stratum	Population A	%	Population B	%	Significance
Separation-related behaviors	Under	46	82 %	29	53 %	0.001*
	Medium	5	9 %	21	38 %	
	High	5	9 %	5	9 %	
Attachment and demand for attention	Under	28	50 %	7	13 %	0.000*
	Medium	14	25 %	25	45 %	
	High	14	25 %	23	42 %	
Miscellaneous problems: hunting behavior	Under	43	77 %	12	22 %	<0.0001*
	Medium	3	5 %	25	45 %	
	High	10	18 %	18	33 %	

*Indicates significant difference $p \leq 0.05$

Source: Palacios, I.

The relationship between population A and population B with the instrument of emotional closeness perceived by the tutors was not significant. In general, very similar values were obtained, population A presented 7% low, 23% high and 68% high; population B 4% high, 15% medium and 82% high (Table 4).

Table 4. Relationship between the level of emotional closeness perceived by tutors and the type of population.

Variable	%	Population B	%
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	Variable stratum	Population A		Population B		Significance
Perceived emotional closeness	Under	4	7 %	2	4 %	0.32
	Medium	13	23 %	8	15 %	
	High	38	68 %	45	82 %	

*Indicates significant difference $p \leq 0.05$

Source: Palacios, I.

In the aggression section, population B had higher levels of aggression towards dogs and strangers. This finding is consistent with that reported by Brand et al. (2022), who indicate that pups born during the pandemic had limited exposure to diverse visitation and social contexts, which likely contributed to behavioral problems. Shoesmith et al. (2021) also support this idea, suggesting that the COVID-19 pandemic exacerbated, and even induced, aggressive behaviors in some pets. A study conducted in Italy reinforces these findings, demonstrating a significant impact of confinement restrictions on puppies born in 2020, who exhibited aggressive and fearful behaviors. In particular, lack of exposure to varied environments between three and six months of age correlated with increased aggression towards unfamiliar people. Likewise, fear toward unfamiliar dogs was notably more common in dogs that grew up during the pandemic compared to those born before this period.

De Sousa et al. (2023) identified, in their research, that one of the most frequent changes in the dogs' behavior during 2020 was fear of loud sounds, present in 53% of the dogs evaluated. Population B also showed a higher frequency of behaviors related to separation anxiety, which could be a direct result of the abrupt change from being accompanied by their guardians during confinement to being left alone at home when they returned to face-to-face work (Burke, 2022). This change in daily routine generated high levels of anxiety and frustration in the dogs (Jiménez Alique, Á., 2021). In a study conducted in 2020, it was observed that 12% of the dogs presented more frequent attachment behaviors and demand for physical attention towards their guardians, compared to 7% of the dogs that

did not experience confinement (Jeziński et al., 2021). Similarly, the present study found that 87% of dogs born during the pandemic exhibited medium to high levels of attachment and attention-demanding behaviors, in contrast to 50% of the A population.

Similarly, Shoemith et al. (2021) concluded that pets showed a more intense attachment to their guardians during and after the pandemic, presenting, in addition, separation problems when left alone at home. In terms of perceived emotional closeness, no significant differences were found between the two study populations, as both showed high levels of emotional bonding between the guardian and their dog. This highlights the importance that guardians attach to their dogs, which was also observed by Santibáñez-Rivera (2022). Bowen et al. (2020) suggest that the increased emotional needs of guardians could negatively affect dogs with previous behavioral problems. Bolstad et al. (2021) reported that 86.5% of people stated that their pets helped them cope with stress and negative emotions during confinement, which explains, in part, the high levels of emotional closeness reported in the B population. In addition, stressors to humans during the 2020 pandemic could have influenced the behavioral changes observed in dogs (Boardman and Farnworth, 2022).

Finally, no significant relationship was found between type of home and age of the guardian with behavioral problems in the dogs, which is consistent with the study by De Sousa et al. (2023), which also found no relationship between behavioral change and type of home. However, in the present study, a significant relationship was found between the death of a family member or person close to the guardian during 2020 and the occurrence of attachment and attention-demanding behaviors in the dogs.

Conclusions

Through the application of the C-BARQ questionnaire, the most frequent behavioral problems were identified in two populations of dogs. Among the most common behaviors were aggression towards unfamiliar dogs, fear of new objects or situations, as well as behaviors associated with attachment and demand for attention, and hunting behaviors. In contrast, the least reported problems included fear of

and aggression toward people in the household. The analysis did not reveal a significant relationship between the type of household in which the pups grew up in 2020 or the age of the guardians with the prevalence of behavioral problems. However, there was a notable correlation between the death of a person close to the guardian and the occurrence of attachment and attention-demanding behaviors in the dogs. In addition, no relationship was found between the type of population and the emotional closeness perceived by the guardians. Finally, dogs that underwent their socialization period during the pandemic presented significantly higher rates of aggression and fear towards unknown dogs, separation-related behaviors, attachment and attention-demanding behaviors, as well as hunting behaviors, compared to those that underwent their socialization stage before 2020.

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