Toward integrated veterinary care: a national survey on physical and behavioral health in Belgian companion animals

Naar geïntegreerde diergeneeskundige zorg: een nationale enquête over de fysieke en gedragsmatige gezondheid van Belgische gezelschapsdieren

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ABSTRACT

Health has been defined as the overall state of physical, mental, and social well-being. This also applies to companion animals, where both physical and behavioral health must be taken into consideration. Behavioral issues in pets can significantly impact both their welfare and that of their caregivers, creating a psychosocial burden as caregivers manage the challenges of caring for an animal with compromised health. In a national survey, the prevalence of physical and behavioral issues in dogs and cats in Belgian households was examined, with a focus on their effect on caregiver welfare. Responses from 976 dog caregivers and 1793 cat caregivers indicated that 41.4% of dog households and 31.9% of cat households reported physical and/or behavioral health problems. While these rates were lower than those reported in international studies, the caregiver burden was substantial. Caregivers of pets with health issues, especially behavioral health problems, reported significantly higher care efforts. Moreover, the survey revealed that caregivers frequently sought advice from their veterinary general practitioner, highlighting the critical role of veterinary professionals in addressing both physical and behavioral health concerns. In this study, an integrated approach to veterinary care is advocated for, and the need for veterinarians to be knowledgeable about the behavior of their patient species is emphasized. Ghent University's Clinical Behavioural Team and Ethology and Animal Welfare Research Group developed a position statement outlining key points for giving behavioral advice in veterinary general practice. Ultimately, the authors argue that interdisciplinary collaboration, caregiver education, and a strong understanding of animal behavior are essential for improving the welfare of both animals and their caregivers.

SAMENVATTING

Gezondheid omvat de algehele toestand van fysiek, mentaal en sociaal welzijn. Dit geldt ook voor gezelschapsdieren, waarbij zowel de fysieke als de gedragsmatige gezondheid in overweging moet worden genomen. Gedragsproblemen bij huisdieren kunnen een aanzienlijke impact hebben op zowel hun eigen welzijn als dat van hun eigenaar, wat kan resulteren in een psychosociale last voor de eigenaar bij de zorg voor een dier met een verminderde gezondheid. In een nationale enquête werd de prevalentie van fysieke en gedragsmatige problemen bij honden en katten in Belgische huishoudens onderzocht, met bijzondere aandacht voor de impact op het welzijn van de eigenaar. Uit de antwoorden van 976 hondeneigenaars en 1793 katteneigenaars bleek dat 41,4% van de hondenhuishoudens en 31,9% van de kattenhuishoudens melding maakten van fysieke en/of gedragsmatige gezondheidsproblemen. Hoewel deze cijfers lager waren dan die beschreven in internationale studies, was de belasting voor eigenaars aanzienlijk. Eigenaars van huisdieren met gezondheidsproblemen, vooral gedragsproblemen, rapporteerden significant hogere zorginspanningen. Daarnaast toonde het onderzoek aan dat eigenaars vaak advies inwinnen bij hun eerstelijnsdierenarts, wat de cruciale rol van dierenartsen benadrukt bij het aanpakken van zowel fysieke als gedragsmatige gezondheidsproblemen. In deze studie wordt gepleit voor een geïntegreerde benadering van diergeneeskundige zorg en wordt benadrukt dat dierenartsen kennis dienen te hebben van het gedrag van de diersoorten die zij behandelen. Het Klinisch Gedragsteam en de Onderzoeksgroep Ethologie en Dierenwelzijn van de Universiteit Gent stelden een positiestandpunt op met de belangrijkste punten gerelateerd aan het geven van gedragsadvies in de eerstelijnsdierenartspraktijk. Concluderend stellen de auteurs dat een interdisciplinaire samenwerking, educatie van eigenaars en een goed begrip van diergedrag essentieel zijn voor het verbeteren van het welzijn van zowel dieren als hun eigenaars.

INTRODUCTION

Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity (WHO). This definition underscores the importance of mental health, which is intrinsically linked to physical welfare, also in non-human animals. Factors influencing physical health are interwoven with change in behavior. For instance, chronic stress plays a central role in the etiology of feline lower urinary tract disease (Buffington, 2011; Hanna-Mitchell et al., 2014). Similarly, stress can exacerbate existing physical conditions such as canine idiopathic epilepsy (Forsgård et al., 2018), while physical health problems, including orthopedic and dermatological conditions, can contribute to stress and anxiety, leading to behavioral signs like aggression, fear-related behavior, or house soiling among cats (Mills et al., 2020) and dogs (Dreschel, 2010; Mills et al., 2020; McAuliffe et al., 2022).

Behavioral problems in companion animals are a serious concern in veterinary medicine and can impact animal welfare as well as strain the relationship between animals and their caregivers (Seibert et al., 2008; Buller et al., 2020). Timely and effective interventions are warranted, as relinquishment and, in some cases, euthanasia are possible consequences (Salman et al., 1998; O'Neill et al., 2015). Beyond their impact on animals, behavioral problems in pets can also affect their caregiver's welfare. The concept of caregiver burden describes the physical, emotional, psychological, and financial strain associated with caring for a pet with chronic (mental) health issues (Spitznagel and Carlson, 2019; Spitznagel et al., 2023; Kuntz et al., 2023). Pet caregivers experiencing caregiver burden may feel socially restricted, guilty, or overwhelmed by their responsibilities. Witnessing a pet suffer from illness or behavioral difficulties can contribute to anxiety, depression, and a decreased quality of life in caregivers (Spitznagel and Carlson, 2019; Kuntz et al., 2023).

Behavioral problems in companion animals may come in different forms, including fear, anxiety, aggression, inappropriate elimination, excessive vocalization or repetitive behaviors (Horwitz, 2000; Camps et al., 2019; Stellow, 2018). These issues often arise from multiple factors, such as genetics, socialization, environmental influences and human-animal interactions (Overall et al., 2006; Weinstock, 2008; Nagasawa et al., 2014; Tiira and Lohi, 2015; Tiira, 2019; Salonen et al., 2020). In several studies, the high prevalence of behavioral problems in companion animals has been highlighted. In a study in 502 Danish dog caregivers, it was found that 34% of the caregivers reported their dog had one or more problems related to behavior, with fear-related problems being the most common (18%), followed by disobedience (11%), and aggression (10%) (Meyer et al., 2023). In a caregiver reported study from the US, Dinwoodie et al. (2019) found a prevalence of canine behavior problems of 85% in a sample of 4114 dogs. The most common issues in this sample were fear and anxiety (44%), aggression (30%) and jumping (28%). Similar patterns have been observed in cats. A study in a Danish cat population (N = 415) revealed that about half of the cat caregivers reported at least one behavioral problem, with the most common ones being damaging furniture (21.7%), social fear (15.1%), and house soiling (12.4%) (Sandoe et al., 2017). Additionally, in a US study in 126 shelter cats, it was found that

one-year post-adoption, caregivers reported behavioral problems such as house soiling (8%), aggression towards people (35%) and aggression towards other cats (24%) (Wright and Amos, 2004).

Despite the high prevalence of behavioral problems reported in other countries, data for companion animals in Belgium remain scarce. With an estimated population of 2.5 million cats and 2 million dogs, and approximately 33% of families owning at least one cat and 30% owning at least one dog (FEDIAF, 2022), understanding the extent of behavioral issues in this population is essential. The prevalence of these problems is useful to evaluate trends over time, measure societal impact, and identify risk factors. Such insights are crucial for optimizing caregiver education, refining animal welfare policies, and enhancing quality of life for both pets and their caregivers.

This study aims to address this gap by investigating the prevalence of physical and behavioral problems in Belgian companion animals through a caregiver-based online survey. Other related aspects such as treatment implemented, caregiver advice-seeking strategies, and caring efforts are included. In the examples stated above, the authors used the terminology applied in the original research; however, for the current study, behavioral problems are labeled as any behavior perceived by the owner as problematic. The findings of this study will help to better understand the scope and severity of behavioral problems in companion animals in Belgium, raising awareness and fostering collaboration between pet caregivers and veterinary professionals. Ultimately, these insights may improve both animal welfare and caregiver support in veterinary practice.

MATERIALS AND METHODS

Ethics statement

The study was reviewed in line with Ghent University policy and deemed not to require specific ethical approval.

Survey design

A survey consisting of 28 questions was developed, with two distinct versions tailored for dog and cat caregivers. Convenience sampling was used, targeting Belgian households currently owning at least one dog or cat. The survey was distributed in French and Dutch via social media platforms (e.g. Facebook and Instagram) between June 14, 2024, and August 15, 2024. Each household could only submit one response per species, which was controlled by requiring participants to provide a valid email address; duplicate entries from the same email were not permitted. No instructions were given on how to select an animal in case they had more than one of the same species.

The survey consisted of two sections: (1) questions addressing the physical and behavioral health of companion animals, treatment methods, and perceived effort scores, developed in collaboration with the authors; and (2) questions focused on the general lifestyle of Belgian caregivers and their pets (feeding practices, activities, lifestyle habits, expenses, and social media engagement), developed by Hifolks Agency (Dogofriends). For this study, only the relevant questions from section 1 were retained. These questions covered the animals' physical and behavioral problems (including types of issues and treatments used), and the caregiver's primary contact for behavior-related questions. Additionally, participants were asked to rate the perceived effort required to care for their companion animal(s) on a scale from 0 to 10. The questions of the survey used in this paper can be consulted in the supplementary materials in the online version (https://openjournals.ugent.be/vdt/).

Data plan and statistical methods

Survey data for the relevant questions were exported to Microsoft Excel (version 16.92) for preprocessing. The dataset was reviewed and cleaned, with open-ended responses manually categorized. The prevalence of physical and behavioral problems and caregivers' approaches to behavioral issues were calculated using descriptive statistics directly in Excel. The data were then saved as CSV files and imported into JASP 0.18.3 for further analysis. Caregivers were grouped into four categories based on their companion animal health conditions: no problems, physical problems, behavioral problems, and both physical and behavioral problems. Descriptive statistics were computed, and Kruskal-Wallis tests were used to compare the groups. Post-hoc pairwise comparisons were conducted using Dunn's test with Bonferroni correction.

RESULTS

In total, 2809 questionnaires were obtained: 1247 for cats in French, 563 for cats in Dutch, 624 for dogs in French, and 375 for dogs in Dutch. During data cleaning, 37 test submissions were excluded. These test submissions were conducted by the research team before and during the data collection to ensure the questionnaire functioned correctly throughout. Additionally, three responses were removed as they referred to pets that had passed away at the time the survey was completed. Ultimately, 2769 valid questionnaires were obtained, comprising 976 for dogs and 1793 for cats.

Prevalences of physical and behavioral problems in Belgian households

Among the 976 dog caregivers surveyed, 41.4% reported at least one physical or behavioral problem in any of their dogs in the household. Physical prob-

lems were more commonly reported than behavioral problems, with 29.4% of caregivers noting physical issues and 19.2% behavioral issues. Combining these, 7.2% of caregivers reported the presence of both physical and behavioral problems. Similarly, among the 1793 cat caregivers, 31.9% reported at least one issue, with 23.5% noting physical problems, 13.9% reporting behavioral problems, and combining these responses, 5.6% reported both. These findings are visually summarized in Figure 1.

For dogs with physical issues (N = 287) the most prevalent issues were reported to be mobility problems (30.6%), dermatological problems (27.2%), and gastrointestinal problems (17.8%). For cats with physical issues (N = 422), the most prevalent problems were reported to be gastrointestinal problems (26.1%), dermatological problems (23.9%), and urinary problems (19.2%). For dogs with behavioral issues (N = 187), the most prevalent behavioral issues were reported to be anxious behavior (38.0%), aggressive behavior to-

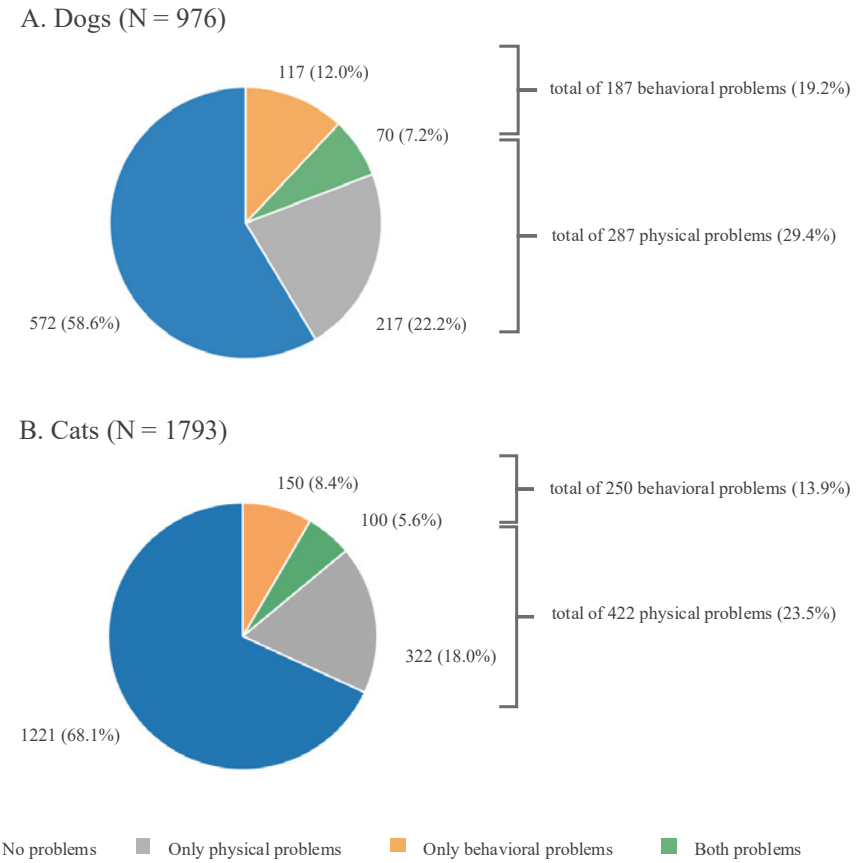

Figure 1. Prevalences of physical and behavioral problems in Belgian households for (A) dogs (top) and (B) cats (bottom).

Table 1. Prevalences of physical problems reported in dogs and cats. The three most prevalent issues per species are indicated in bold.

Physical problems	Dogs (N = 287)	Cats (N = 422)
Dermatological problems	**27.2%**	**23.9%**
Gastrointestinal problems	**17.8%**	**26.1%**
Mobility problems	**30.7%**	8.3%
Urinary problems	4.2%	**19.2%**
Cardiac problems	13.2%	7.1%
Neurological problems	7.7%	5.7%
Sensory problems	3.5%	2.6%
Respiratory problems	2.8%	8.8%
Neoplastic conditions	2.4%	1.4%
Endocrine problems	1.7%	6.6%
Other	9.4%	8.5%

Table 2. Prevalences of behavioral problems reported in dogs and cats. The three most prevalent issues per species are indicated in bold.

Behavioral problems	Dogs (N = 187)	Cats (N = 250)
Anxious behavior	**38.0%**	**43.2%**
Aggressive behavior (dogs/cats)	**34.2%**	**20.8%**
Separation anxiety	**33.7%**	-
House soiling	7.5%	**39.6%**
Jumping up to people	29.4%	-
Aggressive behavior (people)	14.4%	15.6%
Aggressive behavior (other species)	11.2%	6.8%
Destructive behavior	8.6%	8.8%
Repetitive behavior	7.5%	9.2%
Hyperesthesia	-	1.2%
Other	12.8%	8.8%

ward dogs (34.2%), and separation anxiety (33.7%). For cats with behavioral issues (N = 250), the most prevalent behavioral problems were reported to be anxious behavior (43.2%), house soiling (39.6%), and aggressive behavior toward cats (20.8%). A complete overview of the prevalences of all reported physical and behavioral issues per species is given Tables 1 and 2.

Caregivers' approach to behavioral problems

Dog caregivers who reported behavioral problems in at least one of the dogs in the household (N = 187), most commonly used behavioral modification techniques and/or environmental management (70.1%), followed by complementary medical support (supplements) (15.0%) and long-term medication (9.1%). Similarly, cat caregivers reporting behavioral problems in at least one cat (N = 250), frequently used behavioral modification techniques and/or environmental management (46.0%), and complementary medical support (supplements) (20.0%). For a complete overview of all interventions used, see Table 3.

When all participants were asked where they would seek advice about their pet's behavior, both dog (N = 976) and cat (N = 1793) caregivers predominantly chose their veterinary general practitioner, with 83.1% of all dog caregivers and 89.2% of all cat caregivers indicating this preference. Beyond this, dog caregivers most frequently turned to a behavioral coach (23.6%) or a behavioral veterinarian (18.6%), while cat caregivers commonly sought advice from friends or family (20.4%) and the internet (20.3%). Full details are provided in Table 4.

Impact of companion animal health issues on caregiver welfare

Regarding the perceived effort of caring for their dogs, 33.3% of all dog caregivers (N = 976) reported a score of 0 (no effort), 24.2% reported a score between 1 and 3, 29.4% reported a score between 4 and 6 (moderate effort), 10.0% reported a score between 7 and 9, and 3.1% gave a score of 10 (much effort). Households with no reported health issues or only physical issues had a median perceived effort score of 2 (interquartile range (IQR) = 0, 5). In contrast, households with at least one dog with behavioral problems had a higher median effort score of 5 (IQR = 1, 6), while those with both physical and behavioral problems had a median of 4 (IQR = 0, 5.75). A visual overview is given in Figure 2 and in Table S1 in supplementary materials for further details.

A Kruskal-Wallis test revealed significant group differences ($H(3) = 25.85$, $p < 0.001$), suggesting significant differences in perceived effort scores between the groups. Post-hoc pairwise comparisons using Dunn's test with Bonferroni correction showed that caregivers in the 'Behavioral' group reported significantly higher perceived effort scores than those in the

Table 3. Interventions reported by dog and cat caregivers with behavioral problems in their household. The table shows the percentage of the various intervention types used by the caregivers. The most commonly used intervention type is behavioral modification techniques and/or environmental management, as indicated in bold.

Intervention type	Dog caregivers (N = 187)	Cat caregivers (N = 250)
Behavioral modification nd/or environmental management	**70.1%**	**46.0%**
Complementary medical support (supplements)	15.0%	20.0%
Long-term medication	9.1%	6.8%
Punctual medication	5.4%	10.0%
Doing nothing (anymore)	5.9%	10.8%
Other (e.g. odors including pheromones, neutering, nutrition, alternative therapies, etc.)	13.9%	25.2%

Table 4. Sources of advice sought by dog and cat caregivers regarding their pet's behavior. The table shows the percentage of the various sources selected by the caregivers, with the most common being their veterinary general practitioner, as indicated in bold.

Source of advice	Dog caregivers (N = 976)	Cat caregivers (N = 1793)
Veterinary general practitioner	**83.1%**	**89.2%**
Behavioral coach	23.6%	8.9%
Behavioral veterinarian	18.6%	19.4%
Friends or family	17.7%	20.4%
Internet	17.0%	20.3%
Breeder	11.2%	3.8%
Dog clubs	9.9%	-
European behavioral specialist	6.5%	8.4%
Other	1.2%	1.6%

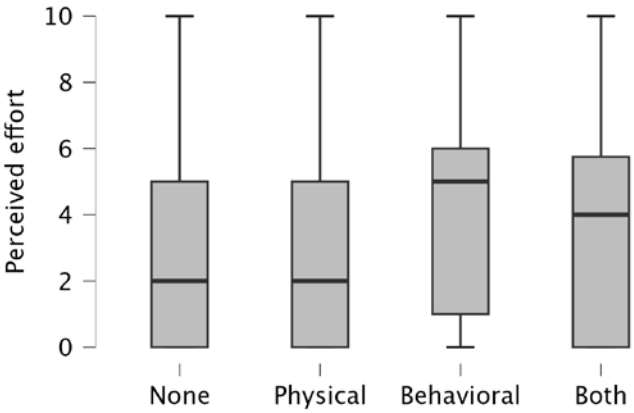

Figure 2. Boxplots illustrating the distribution of perceived effort scores among Belgian dog caregivers (N = 976), categorized by the presence of physical and/or behavioral problems in their dogs.

Table 5. Post-hoc pairwise comparisons using Dunn's test with Bonferroni correction comparing the perceived effort scores to care for their dogs among Belgian caregivers (N = 976). The z-values, mean rank differences (W_i and W_j), p-values and adjusted p-values are reported. Significant p-values are indicated with asterisks (* = p ≤0.05; ** = p ≤0.01, *** = p ≤0.001).

Comparison	z	W_i	W_j	p	p_{bonf}
None - Physical	-1.17	460.81	486.37	0.244	1.000
None - Behavioral	-4.74	460.81	593.04	< .001***	**< .001*** **
None - Both	-2.47	460.81	546.66	0.014*	0.082
Physical - Behavioral	-3.38	486.37	593.04	< .001***	**0.004****
Physical - Both	-1.60	486.37	546.66	0.111	0.664
Behavioral - Both	1.12	593.04	546.66	0.264	1.000

Table 6. Post-hoc pairwise comparisons using Dunn's test with Bonferroni correction comparing the perceived effort scores to care for their cats among Belgian caregivers (N = 1796). The z-values, mean rank differences (W_i and W_j), p-values and adjusted p-values are reported. Significant p-values are indicated with asterisks (* = p ≤0.05; ** = p ≤0.01, *** = p ≤0.001).

Comparison	z	W_i	W_j	p	p_{bonf}
None - Physical	-2.54	855.64	935.73	0.011*	0.067
None - Behavioral	-2.76	855.64	975.91	0.006**	**0.035***
None - Both	-5.79	855.64	1158.94	< .001***	**< .001*** **
Physical - Behavioral	-0.81	935.73	975.91	0.419	1.000
Physical - Both	-3.87	935.73	1158.95	< .001***	**< .001*** **
Behavioral - Both	-2.82	975.91	1158.95	0.005**	**0.029***

'Physical' group (z = -3.38, p = 0.004) and the 'None' group (z = -4.74, p < 0.001). No other comparisons were statistically significant. The results are depicted in Table 5.

Regarding the perceived effort of caring for their cats, 35.8% of all cat caregivers (N = 1793) reported a score of 0 (no effort), 29.2% reported a score between 1 and 3, 24.2% reported a score between 4 and 6 (moderate effort), 7.8% reported a score between 7 and 9, and 3.1% gave a score of 10 (much effort). The median perceived effort was 2 (IQR = 0, 5) for households with no issues, physical problems, or behavioral problems alone. However, when both physical and behavioral problems were present, the median effort rose to 5 (IQR = 1.75, 7). A visual overview is given in Figure 3, and in Table S2 in Supplementary materials for further details.

For the cats, the Kruskal-Wallis test revealed significant group differences (H(3) = 40.90, p < 0.001) in perceived effort. Post-hoc pairwise comparisons using Dunn's test with Bonferroni correction revealed that households with both physical and behavioral problems ('Both' group) reported significantly higher perceived effort compared to all other groups: the 'Physical' group (z = -3.87, p < 0.001), the 'Behavioral' group (z = -2.82, p = 0.029), and the 'None' group (z = -5.79, p < 0.001). Additionally, a significant difference was found between the 'Behavioral' and 'None' groups (z = -2.76, p = 0.035), with the 'Behavioral' group reporting higher effort. No other comparisons were statistically significant. Full results are provided in Table 6.

DISCUSSION

Implications of the results

In this paper, the physical and behavioral health of companion cat and dog populations in Belgium and the impact on the welfare of caregivers are researched. The authors conducted an online survey which was completed by 976 dog caregivers and 1793 cat caregivers; the survey results revealed the presence of physical and/or behavioral problems in 41.4% and 31.9% of the Belgian households of dogs and cats, respectively. Physical problems were more common than behavioral problems in dogs and cats,

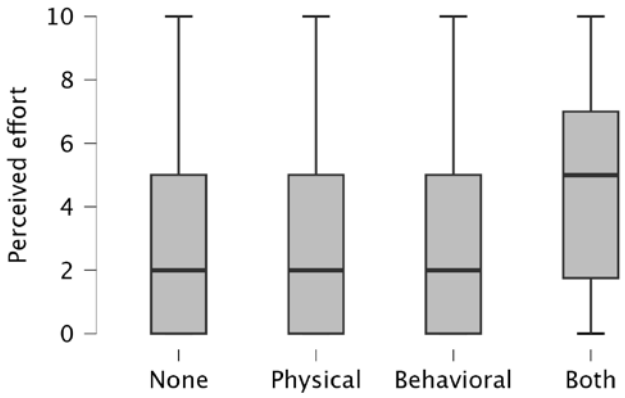

Figure 3. Boxplots illustrating the distribution of perceived effort scores among Belgian cat caregivers (N = 1793), categorized by the presence of physical and/or behavioral problems in their cats.

with the most prevalent problems reported being mobility problems in dogs (30.3%) and gastrointestinal problems in cats (26.1%).

In the studied population, behavioral problems were relatively common, with prevalences reported by caregivers in 19.2% of dog households and 13.9% of cat households. Compared to international data, the reported prevalences are relatively low, with 34% to 85% for dogs (Dinwoodie et al. 2019; Meyer et al. 2023) and up to 50% in cats (Sandoe et al., 2017). However, the distribution of reported behavioral issues maps well onto existing research. In dogs, the high prevalences for anxious behavior (Denmark: 18%, US: 44%), aggression (Denmark: 10%, US: 30%) and jumping (US: 28%) are replicated with 38.0% anxiety, 34.2% dog-directed aggression, 14.4% human directed aggression and 29.1% jumping found for the Belgian dog households (Dinwoodie et al., 2019; Meyer et al., 2023). Furthermore, in the present study, specific emphasis was placed on separation anxiety (33.7%), which may be grouped under anxiety in the other studies. However, recent insights would even refrain from labeling separation-related problems (SRPs) as anxiety, as the underlying emotion could often be frustration rather than fear/anxiety (de Assis et al., 2020). In cats, house soiling and aggression have been reported as the most common complaints seen in veterinary behavioral practice (Bamberger and Houpt, 2006; Amat et al., 2009; Ramos et al., 2020). In the previously mentioned Danish study, caregivers also commonly reported fear/anxiety in their cats (15.1% compared to 43.2% in the present study). However, the most common problematic behavior in that study was destructive behavior including scratching (Sandoe et al., 2017). In the studied population, destructive behavior is less prevalent (21.7% in Danish versus 8.8% in Belgian households), indicating generalization across studies might not be possible for all results.

The results also show that the way caregivers address behavioral problems differs between dogs and cats. In dogs, behavioral modification techniques and environmental management were applied by the majority of caregivers (70.1%), whereas in cats, treatment choices showed more variation, with behavioral modification techniques and environmental management (46.0%) and other treatments (e.g. mainly odors and pheromones) (25.2%) as main choices. Furthermore, twice as many cat caregivers used punctual medication (10.0% versus 5.4%) or chose not to treat the behavioral problem (10.8% versus 5.9%). These differences may be due to the species-specific nature of dogs and cats resulting in different behavioral problems requiring another treatment approach. Other factors at stake may be a reluctance in cat caregivers to take their pet to a veterinarian due to the stressful nature of a veterinary visit (Caney et al., 2022) or a lower motivation among cat caregivers to address behavioral problems may be linked to a lower perceived impact. These problems primarily affect the cat itself and have less effects on people outside of the household. In contrast, behavioral problems in dogs are often more visible in public space. However, the greater popularity of punctual medication and pheromones for cats may be beneficial, as punctual medication can help them cope with acute stressors (e.g. pregabalin for anxiety during transport or a veterinary visit (Laminen et al., 2023), and the use of pheromones or odors aligns with feline species-specific needs related to olfactory communication.

In this study, as well as in the literature cited above, behaviors are classified as behavioral problems based on caregiver reports of them being problematic. However, this does not necessarily mean that the behavior is problematic for the dog or cat itself, which would instead be considered as a behavioral disorder or abnormal behavior. When caregivers report behavior problems, they often contain behavioral disorders, but are much broader: (1) behaviors that are adaptive for the pet but inconvenient for the owner (problematic behavior, e.g. scratching furniture by a cat), (2) behaviors that are not fully adaptive due to the specific environment where the animal is in (maladaptive behavior, e.g. indoor urine spraying in cats), and (3) behaviors that are a manifestation of disruption of the nervous system (malfunctional behavior, e.g. canine post-traumatic stress disorder) (Mills, 2009; Salden et al., 2023). Categories two and three are considered as behavioral disorders and pose a welfare risk for the dog or cat itself. For the first category, educating caregivers to change their attitude or opinion on animal behavior often helps to solve the ‘problem’ and to fill in the pet’s ethological need(s). As a result, caregiver-access to up-to-date knowledge is crucial to prevent and address problems.

When behavioral problems arise, over 80% of caregivers would consult their veterinary general practitioner for advice, highlighting the important role veterinarians must take on. However, previous research indicates that general practitioners often feel reluctant to give behavioral advice, commonly due to a lack of confidence and (perceived) knowledge (Patronek and Dodman, 1999; Golden and Hanlon, 2018; Kogan et al., 2020; Hevern, 2022). At Ghent University, companion animal behavior is integrated in the curriculum of veterinary students via the disciplines of ethology and veterinary behavioral medicine. These complementing scientific fields are taught during the bachelor, as well as the master program in veterinary medicine, both in theory and practice (e.g. skills labs, observation exercises, clinic rotations). Ethology entails the biological study of animal behavior, using a systematic, rigorous approach with the aim of understanding why and how animals behave as they do (Tinbergen, 1963). When an animal’s highly internally motivated behaviors cannot or insufficiently be expressed, and/or its stress coping mechanisms are overruled, behavioral problems may arise, commonly needing veterinary interference. These cases

require a more interdisciplinary approach, leading to the development of veterinary behavioral medicine, which uses the fundamental principles of ethology to diagnose and treat animals with behavioral problems. As a result, a (basic) understanding of key concepts of ethology and clinical behavior is crucial for general practitioners, so they can promote appropriate management of pets supporting their welfare, make evidence-based decisions when behavioral problems arise and refer to behavioral specialists if necessary. As such, these aspects are integrated in the Day One Competences taught at EAEVE certified vet schools (EAEVE, 2019).

In a veterinary context, understanding animal behavior is key not only to ensure health and welfare of the animals themselves but also to promote human welfare. Companion animals have many positive effects on humans, including physical health (e.g. decrease in blood pressure and headaches (Serpell, 1991; Dinis and Martins, 2016)), psychological welfare (e.g. stress- and anxiety reduction (Beetz et al., 2012)) and promotion of social connectivity (Wood et al., 2015). However, chronic disease, including behavioral problems, often comes with a cost to human welfare, labeled as caregiver burden (Spitznagel et al., 2017; Buller and Ballantyne, 2020). In the Belgian study population, a clear effect of caregiver burden was found: both dog and cat caregivers reported significantly higher scores of perceived efforts if one or more of their companion animals had physical or behavioral problems. Moreover, for dog caregivers caring for a dog with a behavioral problem was significantly more demanding than caring for an animal with a physical problem. The impact of behavioral problems extends from the individual patient to the caregiver and relatives, but also broader society (i.e. visitors to the home or passers-by). Furthermore, many misconceptions about behavioral disorders live in society (i.e. 'the dog is not really sick', 'it is the caretaker's fault, as the dog is not well raised'), which lead to loneliness and a feeling of not being seen or understood amongst the caregivers (Buller and Ballentyne, 2020). In cats, this higher impact of behavioral problems compared to medical disease could not be demonstrated, potentially explained by the fact that the societal impact does not reach as far (e.g. visitors may be exposed to an aggressive cat, but problems rarely include casual passers-by), and in cats, even more than in dogs, behavioral disorders may be minimized and misunderstood, also by the caregivers themselves (i.e. the cat is just 'a bully'). Both factors may also contribute to the above mentioned finding that cat caregivers reported more commonly not to treat a behavioral problem. Furthermore, subtle behavioral alterations in the early stages of chronic stress (e.g. decreased appetite, playing less (Amat et al., 2016)) may be overlooked, however, once physical complaints arise (e.g. house soiling, vomiting), the impact on caregivers may increase. A well-known illustration of this interconnection between physical and behavioral health, is the Pandora syndrome as described by Buffington (2011), commonly known as feline idiopathic cystitis, the most prevalent form of feline lower urinary tract disease (FLUTD). Stressful events trigger episodes of cystitis and potentially urinary obstruction resulting in complaints of hematuria, dysuria and discomfort. Although speculative, this link with chronic stress might be found in the present dataset, given the high proportion (19.2%) of urinary tract problems reported by the caregivers.

Ghent University position statement: What should veterinarians know about companion animal behavior?

The results of this study indicate that behavioral problems are common in Belgium and that they also impact caregiver welfare. Moreover, it has been demonstrated that caregivers often seek advice from their veterinary general practitioner. In-depth know-ledge of companion animal behavior is therefore key for Belgian veterinarians. In the next paragraphs, the authors aim to refresh and summarize the key concepts of companion animal behavior to assist veterinarians in their practice. This Ghent University position statement - supported by the Clinical Behavioural Team and Ethology and Animal Welfare Research Group - contains seven aspects to keep in mind about companion animal behavior in veterinary practice. A summary is given in Table 7.

Firstly, the authors advocate for an integrated view on animal health, recognizing that behavior is an integral component of an animal's overall welfare, calling for close collaboration across disciplines. Physical health problems in animals have an associated behavioral aspect, necessitating comprehensive treatment plans. For example, when an animal is given bench-rest following surgery, its need for enrichment and novelty remains. Similarly, an animal suffering from lower back pain may exhibit aggression or anxiety during play due to discomfort.

A second point to highlight is that animals have ethological needs, defined as "a specific behavioral pattern that must be performed regardless of the environment, even when the physiological needs addressed by the specific behavior are satisfied" (Jensen and Toates, 1993). The expression of species-specific ethological needs is essential for an animal's mental well-being, and therefore, failing to meet these needs leads to stress and welfare issues. For example, cats have an intrinsic need to hide and observe from a distance (preferably from a height) to be able to feel safe (Kry and Casey, 2023).

Third, accurate diagnosis in veterinary medicine begins with the careful observation of an animal's behavior and its interaction with its caregivers. Caregivers may not reliably observe their pets' behavior (Mariti et al., 2012; Van Belle et al., 2023) or make their own interpretation, both of which hinder accurate diagnosis. Instead, the authors advise veterinarians

Table 7. Ghent University Opinion Statement containing the seven key points to remember when giving behavioral advice in veterinary general practice.

Seven key points on companion animal behavior problems in practice
1. **Health[2] – The connection between physical and mental health** Understand that companion animal behavior is interwoven with every other discipline in veterinary practice, and that a change in behavior can be among the earliest indicators of an underlying issue. Mental health influences the physical condition, and vice versa.
2. **Back to ethological basics** Every animal, regardless of whether behavioral problems are reported, should be able to fulfil its ethological needs. This will prevent behavioral disorders and other welfare problems from arising.
3. **Observation is key** Observing an animal's behavior, including understanding its function(s), is key for prevention, diagnosis and treatment of behavioral problems.
4. **Detect in time, keep things fine** Early recognition of behavior disorders is crucial to prevent escalation and serious welfare issues.
5. **It's not just about pills – the four pillars of behavioral treatment** A behavioral disorder will never be solved with medication alone. Treating cases involves four pillars: (1) caregiver education, (2) environmental management, (3) behavioral modification, and (4) potential support of psychopharmaceuticals.
6. **Don't guess – let a behavioral specialist assess** Recognize and accept your own limits in behavioral medicine. Inappropriate handling of behavioral disorders might harm pets, caregivers and passers-by. Timely referrals to behavioral experts are necessary.
7. **Caring with compassion** Behavioral problems in pets may form a threat for the psycho-social welfare of caregivers. Attention should be given to caregiver burden during veterinary consultations.

to train themselves in observing companion animal behavior (Menor-Campos et al., 2022) including e.g. body posture and gait, vocalizations, social behavior and appeasing signals, which provide valuable information on the emotional welfare of the animal in the context of the exhibited behavioral problem. Besides home visits and observing the patient while roaming free in the consultation room, the use of video fragments that owners take prior to the appointment are recommended as a helpful tool.

Fourth, early recognition of problematic behaviors is critical to prevent serious welfare issues. Behaviors that initially appear as benign from a caregiver's perspective, such as tail chasing, could be indicative of underlying physical and mental welfare issues (Tynes and Synn, 2014, Burn, 2011). Similarly, generalized anxiety may initially present itself as subtle avoidance behaviors or excessive monitoring of perceived threats, but can cascade into aggression in response to benign stimuli. For instance, fear of fireworks can become a generalized fear of noises (Ballantyne, 2018). Promptly identifying these red flags and acting accordingly is key to prevent escalation and allow more effective treatment.

Fifth, behavioral medicine is a multifaceted discipline and should follow a structured approach. As a start, it should be determined whether any underlying physical health issues are present, as these can influence behavior (and vice versa) and should be adequately addressed if present. Afterwards, a risk assessment has to be carried out to evaluate the impact on all stakeholders. Next, a tailored treatment program is formulated based on the individual needs of the patient, building upon four pillars: (1) caregiver education on the behavioral needs and body language of their pets, as well as insight into the problem, treatment plan, and prognosis, (2) immediate management of the environment to reduce stressors and to provide rapid relief, (3) behavioral modification strategies for long-term behavioral adjustments, and (4) the possible support of psychopharmaceuticals. In this whole process, ongoing owner compliance is pivotal.

Sixth, veterinary general practitioners play a crucial role in educating caregivers about normal behavior (e.g. ethological needs, stress signals) and guiding them on behavioral issues. As seen in the present study, veterinarians are often a primary source for behavioral advice. This presents both an opportunity to have a positive impact and a risk of harm if recommendations are not well-founded. In this respect, recognizing the limits of one's expertise is important as well as prioritizing timely referrals to a qualified veterinary behaviorist rather than waiting until all other options have been exhausted.

Seventh, it is important to recognize that companion animal behavior profoundly affects not only the animal but also the caregiver. The burden of managing problematic behaviors can be overwhelming,

leading to frustration, guilt and even relinquishment. This has also been shown in the current paper via the higher perceived effort scores related to caring for a sick animal. Veterinarians have the opportunity to guide caregivers through the care for their animal, while maintaining or even strengthening the human-animal bond, and in the meantime, enhancing the trust between caregivers and veterinarians.

Study limitations

Several limitations of this study should be noted. Bias in the collected data is suspected due to the methodology employed, i.e. caregiver report via an online survey (Van Belle et al., 2024). Convenience sampling implies that participants' households are self-selected and biased (i.e. social media access) rather than a random population sample. Furthermore, caregivers may not always provide reliable data on the behavior of their pets, as (1) they may not be the best observers of their companions' behavior due to a lack of knowledge, observational skills, or perceived relevance (Van Belle et al., 2023), and (2) deliberate or unconscious under- and overreporting may be present related to caregiver demographics and/or specific bias (e.g. social desirability). Furthermore, certain response options in the survey required interpretation rather than descriptive observations, which increases judgment variability (e.g. what is understood by 'anxiety' may be more variable than 'jumping up'). Therefore, the reported prevalences of physical and behavioral problems cannot be seen as confirmed diagnoses. Also terminology related to behavioral expertise (behavioral coach, behavioral veterinarian) might not have been clear to owners, specifically as the required qualifications for these professions are not strictly regulated. However, the current study aimed to understand the viewpoint of caregivers on their pets' health rather than providing a precise diagnosis of behavioral disorders. If the latter is the objective, further research might focus on behavioral problems seen by professionals (veterinarians, behaviorists), or caregiver reports should be complemented with objective evidence including video footage and brain imaging [Salden et al. (2025) as an example].

Second, the survey collected data at the household level rather than the individual animal level. This approach gave caregivers flexibility in whether they completed the survey for one or more animals, facilitating broad caregiver participation, but restricting the ability to draw detailed conclusions from the data, including correlations. As an example, comorbidity between physical and behavioral problems, illustrating the integrated definition of health, could not be directly assessed. Some indications were present in the data – the large proportion of households reporting both physical and behavioral problems and the overrepresentation of feline urinary problems hinting towards FIC, illustrating the importance of further research exploring this connection in Belgium. Furthermore, future research may also wish to further explore caregiver burden in Belgian households using validated scales (Spitznagel et al., 2017).

CONCLUSION

The current study originated from the integrated definition of health as a state entailing more than physical integrity alone: attention for mental aspects is key. The authors explored the health status of companion dog and cat populations in Belgium using a survey for their caregivers. Both physical and behavioral problems were commonly present, with a variety of behavioral problems reported by caregivers, hinting towards behavioral disorders such as anxiety and repetitive behaviors. Moreover, behavioral problems, especially in dogs, have a potentially large impact on caregiver welfare due to the associated increased effort of caring. These results, combined with the importance that caregivers attach to advice from their vet, underline the importance of understanding companion animal behavior in general practice. Therefore, in this article, the key points for dealing with behavioral cases to assist veterinary general practitioners are summarized; however, referral to a behavioral specialist may be an appropriate course of action in certain cases and this should be done sooner rather than later. Interdisciplinary collaboration helps ensure the best possible health and welfare for companion animals.

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Supplementary materials

The questions of the survey used in this article can be consulted in the supplementary materials in the online version (https://openjournals.ugent.be/vdt). For the Dutch version of the survey questions, see the online attached PDF "National Survey NL".

Table S1. Descriptive statistics of the perceived effort score to care for their dogs among Belgian caregivers (N = 976).

	Perceived effort			
	None	**Physical**	**Behavioral**	**Both**
Valid	572	217	117	70
Missing	0	0	0	0
Median	2.0	2.0	5.0	4.0
Mean	2.7	3.0	4.1	3.7
Std. Deviation	2.9	2.9	3.0	3.2
IQR	5.0	5.0	5.0	5.6
Minimum	0.0	0.0	0.0	0.0
Maximum	10.0	10.0	10.0	10.0
25th Percentile	0.0	0.0	1.0	0.0
50th Percentile	2.0	2.0	5.0	4.0
75th Percentile	5.0	5.0	6.0	5.8

Table S2. Descriptive statistics of the perceived effort score to care for their cats among Belgian caregivers (N = 1793).

	Perceived effort			
	None	**Physical**	**Behavioral**	**Both**
Valid	1221	322	150	100
Missing	0	0	0	0
Median	2.0	2.0	2.0	5.0
Mean	2.5	2.8	3.2	4.2
Std. Deviation	2.7	2.7	3.1	3.1
IQR	5.0	5.0	5.0	5.3
Minimum	0.0	0.0	0.0	0.0
Maximum	10.0	10.0	10.0	10.0
25th Percentile	0.0	0.0	0.0	1.8
50th Percentile	2.0	2.0	2.0	5.0
75th Percentile	5.0	5.0	5.0	7.0

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