

## The epidemiology of behavioural problems in dogs and cats: a survey of veterinary practitioners

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### Abstract

*Behavioural problems directly affect the welfare of dogs and cats. The existence of a behavioural problem is a factor in the euthanasia and relinquishment of animals to shelters — a significant proportion of companion animals that are abandoned and euthanased are attributed to behavioural problems. Some behavioural problems are linked to stress and anxiety. In order to prevent and treat behavioural problems it is essential to have good epidemiological data. Most studies regarding the prevalence of behavioural problems use data from veterinary behaviourists. To our knowledge, no studies regarding the prevalence of small animal behavioural problems have been conducted in Spain. Therefore, a study was designed to estimate different aspects of canine and feline behavioural problems in Spain from the perspective of the veterinary practitioner. Of 433 valid questionnaires returned during a six month period, 46.2% of veterinarians referred cases to veterinary behaviourists and 12.3% to dog trainers; 34.7% never referred cases. Destructiveness, aggression and house soiling were the most frequent complaints regarding behavioural problems in dogs, whereas house soiling was clearly considered the main behavioural complaint in cats, followed by furniture scratching and excessive vocalisation. Behavioural modification was considered the most effective treatment for dogs, followed by drugs and castration. In cats the most effective treatment was castration, followed by drug therapy and behavioural modification.*

**Keywords:** aggression, animal welfare, behavioural problems, cat, dog

### Introduction

The occurrence of behavioural problems in pets has strong animal welfare implications. For example, canine aggression is considered to be a serious public health problem and very often leads to the euthanasia or abandonment of the dog. Furthermore, behavioural problems as a whole are considered to be an important factor in the euthanasia and relinquishment of dogs and cats to animal shelters (Stead 1982; Patronek *et al* 1996). Several behavioural problems, including separation anxiety in dogs and certain forms of urine-marking in cats, can be attributed to reactions to anxiety or stress (Horwitz 2002a,b; Beaver 2003).

In order to design preventive programs and to develop treatment strategies it is essential to have good epidemiological data about the behavioural problems of companion animals. These can be obtained from three different sources: direct surveys of owners of dogs and cats, databases of small animal behavioural specialists and information from small animal veterinary practitioners.

Data from surveys of pet owners are perhaps the best way to estimate the actual prevalence of behavioural problems in companion animals and all studies conducted using this approach suggest that behavioural problems are very common. For example, in a study conducted in the USA

more than 40% of dog and cat owners reported that their pets displayed one or more behavioural problems (Voith 1985). In another study, also conducted in the USA, the prevalence of behavioural problems in dogs was 87%, with a mean of 4.7 problematic behaviours per dog. The most frequent complaints were jumping up at people (37%) and excessive barking (33%) (Campbell 1986).

In the UK, a survey conducted of 50 dog owners found problematic behaviours in 80% of the animals (O'Farrell 1992). Another study conducted in the UK, which included 722 dogs from 502 different households, found that 76% of dogs had shown aggressive behaviour, 70% inappropriate elimination, 57% pulled on the lead, 48% were easily excitable and 23% behaved improperly when travelling (Lindell 2002).

The differences observed between these studies regarding the most common behavioural problems could be attributed to methodological aspects, for example the way questionnaires were designed, and differences in the ways pets are kept in different countries.

Most studies regarding the prevalence of behavioural problems in dogs and cats suggest that only a small proportion of pets which exhibit problematic behaviours are taken to the veterinarian to solve the problem. Data from a study conducted in the USA suggested that

**Box I Questionnaire.****The epidemiology of behavioural problems in dogs and cats**

1. Are you consulted about behavioural problems?
  - a. Yes.
  - b. No.
  
2. How do you solve behavioural problems?
  - a. Ethology is not a veterinary field.
  - b. I refer all cases to a dog trainer.
  - c. I refer all cases to a veterinary behaviourist.
  - d. I try to solve some cases and refer the rest to a dog trainer.
  - e. I try to solve some cases and refer the rest to a veterinary behaviourist.
  - f. I try to solve all cases myself.
  
3. What proportion of animals euthanased in **your** clinic are attributable to a behavioural problem?  
 \_\_\_ of 10.
  
4. What are the most frequent complaints about canine behaviour?  
 (Please rank from 1 to 9).
  - \_\_\_ Excessive barking.
  - \_\_\_ Aggression.
  - \_\_\_ Destructiveness.
  - \_\_\_ Inappropriate urination and/or defecation.
  - \_\_\_ Overactivity.
  - \_\_\_ Noise phobias (thunderstorm, fireworks, etc).
  - \_\_\_ Uncontrolled during walks.
  - \_\_\_ Stereotypies/compulsive behaviour (self-mutilation, tail-chasing, circling, etc).
  - \_\_\_ Fear of people and/or other dogs.
  
5. In cases of canine aggression, who is the most frequent target of the attacks?  
 (Please rank from 1 to 3).
  - \_\_\_ Family members.
  - \_\_\_ Non-familiar people.
  - \_\_\_ Other dogs.
  
6. What are the most frequent complaints about feline behaviour?  
 (Please rank from 1 to 7).
  - \_\_\_ Aggression towards people.
  - \_\_\_ Aggression towards other cats.
  - \_\_\_ Inappropriate urination and/or defecation.
  - \_\_\_ Overactivity.
  - \_\_\_ Excessive vocalisation.
  - \_\_\_ Furniture scratching.
  - \_\_\_ Stereotypies/compulsive behaviour (psychogenic alopecia, feline hyperesthesia syndrome, etc).
  
7. Which of the following treatment options do you consider most useful to treat aggressive problems in dogs?  
 (Please rank from 1 to 3).
  - \_\_\_ Castration.
  - \_\_\_ Behavioural modification.
  - \_\_\_ Drugs.
  
8. Which of the following treatment options do you consider most useful to treat aggressive problems in cats?  
 (Please rank from 1 to 3).
  - \_\_\_ Castration.
  - \_\_\_ Behavioural modification.
  - \_\_\_ Drugs.

70–75% of reported behavioural problems were never considered serious or dangerous enough to seek professional advice (Anderson & Vacalopoulos 1987). In the aforementioned study by O'Farrell (1992), only 25% of the owners that reported behavioural problems in their pets considered them to be seriously problematic. Furthermore, a study conducted in the USA found a high prevalence of potentially problematic behaviours in a population of cats that were otherwise considered by their owners to be well-behaved pets: scratching was reported

by 60% of the owners, 36% reported aggressive behaviour towards other cats and 16% reported house soiling and excessive vocalisation; however, none of the owners had looked for professional help at the time the study was carried out (Morgan & Houpt 1990). The motives for not seeking professional advice are diverse and could include a lack of proper information regarding the nature of behavioural problems, the potential value of behavioural therapy to correct them, as well as the relatively tolerant attitude of most dog and cat owners.

The databases of small animal behaviourists contain many epidemiological studies. One of the most comprehensive studies was conducted at the Small Animal Clinic at the University of Pennsylvania from 1905 telephone calls regarding canine behavioural problems and 720 regarding feline behavioural problems. In dogs, the most frequent problem was aggression (46%), followed by inappropriate elimination (20%), destructive behaviour (16%), fear related problems (9%) and excessive barking (5%). In cats, inappropriate elimination was clearly the most common problem (66%), followed by aggression (25%) (Borchelt & Voith 1996).

Data from other studies show that aggression is invariably considered the most frequent complaint regarding canine behaviour, reported in 42–59% of all cases seen by small animal behaviourists (Overall 1997a; Beaver 1999). Regarding feline behaviour, the estimated prevalence of inappropriate elimination varies between 40% and 75% of all cases attended by behavioural specialists (Overall 1997b).

To the best of our knowledge, no comprehensive studies have been conducted regarding the prevalence of behavioural problems from the perspective of the small animal veterinary practitioner, and no information is currently included in applied small animal behaviour textbooks. However, differences could exist between the most common behavioural problems present in the canine population, those attended by behaviourists and those seen by veterinary practitioners. In addition, comparisons between different kinds of studies could be difficult when using data from surveys of the general population and data from animal behaviourists; the former usually focus on symptoms, whereas the latter usually focus on specific diagnoses. For instance, a veterinary diagnosis of separation anxiety can appear in a survey of dog owners as a combination of destructiveness, excessive vocalisation and/or inappropriate elimination.

This relative lack of information conflicts with the central role played by the veterinary practitioner in providing clients with information regarding the early recognition of problems and the ways to treat them. According to data from the American Animal Hospital Association (AAHA), approximately 50% of owners have consulted their veterinarian about behavioural problems on at least one occasion (AAHA 1993). Furthermore, a similar study found that 68% of clients that go to a veterinary practice for any reason also ask questions in relation to canine and feline behaviour (Beaver 1999).

The interest of small animal veterinary practitioners in behavioural issues is also related to economical reasons. In the USA, an annual loss of 15% of patients was linked to the existence of behavioural problems (Sigler 1991).

This study was designed to estimate different aspects of canine and feline behavioural problems from the perspective of the veterinary practitioner; because of the implications to Public Health, a specific interest was shown to problems of aggression.

## Materials and methods

A questionnaire was sent by mail to 3000 small animal veterinary practices listed in Spain. To encourage participation, an introductory manual about aggression in dogs was advertised and sent as a gift to all veterinarians that responded to the questionnaire. The period for returning questionnaires was limited to six months.

Questions ranged from those that asked about a veterinarian's attitude when facing a behavioural problem, to those that asked for an estimate of the most frequent behavioural problems seen by Spanish veterinarians and the general methods used to treat them (Box 1).

To avoid misinterpretations regarding questions about the distribution of behavioural problems, it should be noted that veterinarians were asked about the most frequent behavioural complaints (eg symptoms) rather than about specific clinical diagnoses. All data were analysed using SPSS® 10.0 for Windows (SPSS Inc, Chicago, USA). From a methodological perspective, questions were divided into two groups:

Questions 1–3 required simple descriptive statistics.

Questions 4–8 required every veterinarian to provide a rank for the different answers. A Friedman test was used to analyse all data for each question, assuming that answers were not independent. A Wilcoxon test was used to compare pairs of answers. Questions 4 and 6 yielded 36 and 28 comparisons respectively. Consequently, significant *P* values for these questions were reduced according to Sidak's correction ( $1-[1-P]^n$ , *n* being the number of comparisons). According to this analysis, clusters of behavioural problems were established.

## Results

A total of 451 replies were received, of which 433 were suitable for analysis.

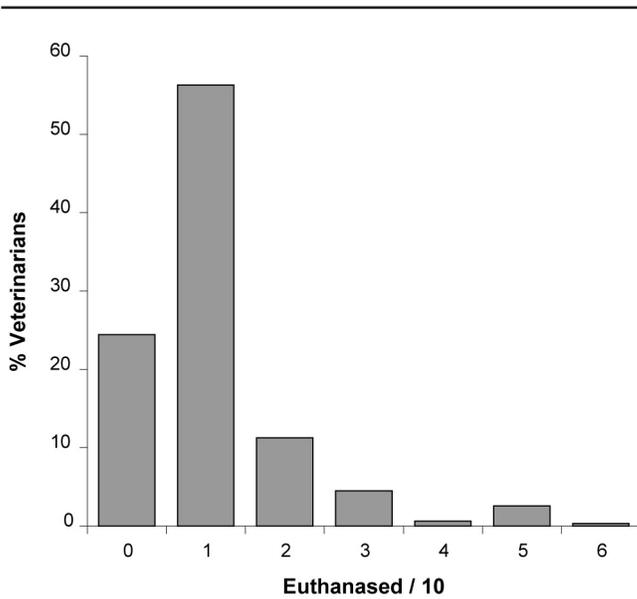
### General information: questions 1, 2 and 3

In response to question 1, 98.3% (*n* = 400) of the veterinarians who replied to the questionnaire were consulted about behavioural problems in dogs and cats. From the 85% (*n* = 340) of veterinarians that responded to question 2, 99.7% considered the solution to behavioural problems to be a veterinary responsibility. The majority of veterinarians referred behavioural cases: 46.2% referred to veterinary behaviourists and 12.3% to dog trainers. However, 34.7% of the veterinarians never referred behavioural cases; 6.8% of questionnaires showed multiple answers for question 2. Of the 76.0% of veterinarians who answered question 3, 57.0% (*n* = 311) estimated that at least 10.0% of euthanasia cases were carried out because of a behavioural problem (Figure 1), whereas 19.0% of veterinarians estimated that at least 20.0% of euthanasia cases were due to problematic behaviours.

### Distribution of behavioural problems: questions 4, 5 and 6

The veterinarians who responded to question 4 (*n* = 236) thought that destructiveness was the most frequent complaint regarding canine behavioural problems, followed closely by

Figure 1



The number of dogs and cats estimated to be euthanased because of behavioural problems for every 10 animals euthanased (mean = 1.1, n = 311).

aggression and house soiling; less frequent problems included a lack of control during walks, overactivity and stereotyping. The results of the Friedman test for question 4 showed significant differences between the answers ( $P < 0.05$ ). Comparisons by pairs showed that non-significant differences could be established between excessive barking, aggression, destructiveness, and inappropriate urination and/or defecation that were consequently grouped in one single cluster. Noise phobias took the fifth position, followed by a cluster including social fears, lack of control during walks and overactivity. The last position was assigned to compulsive disorders (Figure 2a).

According to question 5, other dogs were the most common target of canine aggression (39.2%), followed by non-familiar people (36.5%) and family members (24.3%) respectively (n = 398). The results of the Friedman and Wilcoxon tests (after Sidak's correction) showed significant differences between family members and the other two options ( $P < 0.05$ ).

It was concluded that inappropriate elimination was the most frequent behavioural problem in cats, followed by furniture scratching, and a cluster of excessive vocalisation and aggression towards people and other cats; overactivity and compulsive disorders shared the last two ranking positions (Figure 2b).

#### Treatment of behavioural problems: questions 7 and 8

Veterinarians considered behavioural modification to be the most useful tool in the treatment of canine behavioural problems, followed by drugs and castration. In feline behaviour the most useful treatment option was castration, followed by drug therapy and behavioural modification (n = 252); the results of the Wilcoxon tests indicated significant differences between all pairs ( $P < 0.05$ ).

## Discussion

Only 15% of the 3000 veterinarians who received the questionnaire decided to get involved in the study; therefore, it is possible that the results were biased towards those practitioners showing greater motivation for clinical ethology and animal welfare issues. Data on the percentage of referred cases, the proportion of dogs and cats euthanased because of behavioural problems, or the willingness to use behavioural modification techniques may have been lower if the whole Spanish veterinary community had been involved in the study. The vast majority of veterinarians considered clinical ethology to be a veterinary field and referred cases on a regular basis: 46% referred behavioural consultations to other colleagues and only 12% referred to dog trainers. However, more than 35% of practitioners never referred cases, neither to other veterinarians nor to dog trainers; the reasons for this could be diverse.

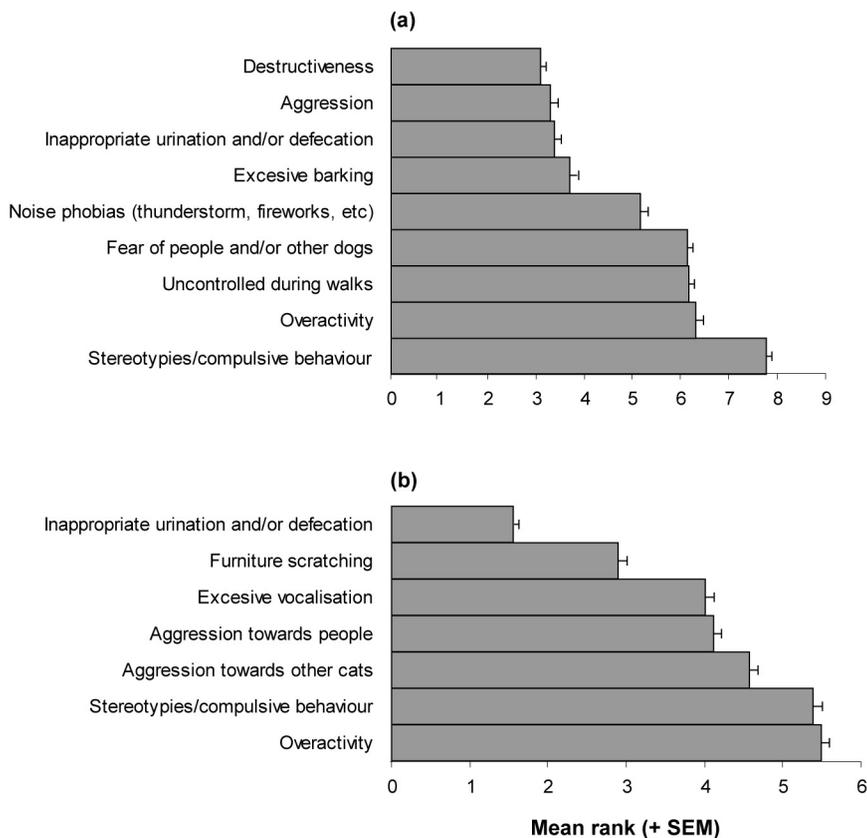
On one hand, many Spanish veterinarians could be reluctant to refer cases to specialists. According to a survey conducted in Spain in 2003 of 230 veterinary practitioners, 18% never referred cases to other colleagues and 65% referred less than 10% of their total caseload. Only 17% referred more than 10% of their cases (Asis Veterinaria personal communication).

In other countries, like the USA, the situation may be comparable. A survey conducted in the USA showed that veterinary practitioners were still reluctant to refer cases to specialists (Thomson Veterinary Healthcare Communications 2003). For example, 42% declared to be able to solve all consultations themselves, and 20% declared that they were suspicious about referring clients because of a lack of communication between the specialist and their own veterinary practice. Furthermore, the readiness to refer a case to a colleague depends on the specialty. From a list of 14 clinical fields, clinical ethology was ranked in 12<sup>th</sup> position regarding the veterinarian's willingness to refer cases, followed only by dentistry and radiology. More specifically, only 51% of the surveyed veterinarians considered referring cases to behaviourists, whereas this percentage rose to 94% for ophthalmology and 88% for orthopaedics (Thomson Veterinary Healthcare Communications 2003). There may be also multiple reasons for these differences between ethology and other clinical specialties. In this sense, veterinarians may still be less well-trained to recognise and treat behavioural disorders compared with other fields or they may simply fail to fully accept behavioural medicine as a veterinary field. Although the situation has changed dramatically during recent years, a study conducted in the USA in three general veterinary practices indicated that most dog and cat owners believed that their veterinarians should be able to deal with behavioural consultations. However, at the same time, the perception of those owners was that veterinarians were not properly trained in this subject (Case 1988).

On the other hand, most veterinary behaviourists and dog trainers in Spain are concentrated in major urban areas, like Barcelona and Madrid. According to data from the Spanish Small Animal Veterinary Association (AVEPA) there are

**Figure 2**

Mean rank (+ SEM) of the most frequent  
(a) canine and (b) feline behavioural  
problems.



still many areas in which no behaviour specialists are listed. This relative lack of qualified specialists could be even more pronounced regarding cats. In a survey of 30 animal behaviourists by the Animal Behaviour Consultant Newsletter in 1987, 29 reported to treat cats; however, it should be noted that not all behavioural problems were treated by veterinarians or animal behaviourists and that most dog trainers were not able to solve feline cases (Overall 1997a). Furthermore, full length telephone or internet consultations are uncommon in Spain at present.

Concerning euthanasia, more than 75% of veterinarians estimated that at least 10% of all pet losses were related to behavioural problems. In the USA, 50–70% of animals taken to shelters were euthanased because of their behaviour (Overall 1997a). Another study conducted in Scotland estimated that 39% of the total of dogs and cats that were euthanased for no medical reasons involved behavioural problems (Stead 1982).

Regarding the range of canine behavioural problems, it is interesting to note that aggression was considered to be as frequent as destructiveness, excessive barking and inappropriate elimination. These data contrast with data from most veterinary behaviourists, where aggression is by far the most frequent complaint. A study collecting data from three behavioural referral practices — one in Canada and two in the USA — found that 59% of 743 cases attended were because of aggression (Lindsay 2001). The main reason for

this divergence could be that the owner's tolerance for behavioural problems such as destructiveness and improper elimination may be higher than for aggression, even in its milder presentations. In addition, the referral of aggressive dogs may be easier for the veterinary practitioner than for dogs exhibiting other problematic behaviours. In fact, behavioural problems are very frequent, but only some of them are serious enough to require the intervention of specialists. In the aforementioned survey by O'Farrell (1992) of 50 pet owners in the UK, only 20% of dogs were considered to be perfectly behaved pets, whereas 20% of owners believed that their dogs did things that caused definitive inconvenience. Finally, it should be remembered that an undetermined proportion of aggressive dogs could be attended by dog trainers directly, with or without the knowledge of the veterinarian.

The actual prevalence of noise phobias was probably underestimated by Spanish veterinarians by ranking this problem fifth. A survey of 1422 dog owners from California, USA, indicated that 20% of dogs exhibited fear of loud noises (Campbell 1986). In another study, 38% of 2018 owners reported dogs showing fear of loud noises (Lindsay 2001). However, only a small percentage of all cases attended at referral practices were related to noise phobias (Landsberg 1991). Again, noise phobias are behavioural problems that are easy to live with and may even be considered normal by most dog owners. In human

medicine, the six month prevalence for specific phobias is 5–10%, although only a small proportion of patients seek professional advice (Kaplan *et al* 1994).

As a whole, aggression towards people was clearly the most common scenario for aggression in dogs (61%); these results are comparable with those from veterinary behaviourists. According to different studies, people are by far the most common target of aggressive dogs presented to veterinary behaviourists. Aggression towards people was the most frequent complaint (79%) of 515 telephone calls made to the Animal Behaviour Clinic of the University of Pennsylvania (Borchelt & Voith 1996).

In this study, aggression towards non-familiar people (37%) was considered to occur more frequently than towards family members (24%); data from public health statistics are similar to these results. A study carried out in Australia reported that the family dog was involved in 25–33% of all bites (Podberscek & Blackshaw 1991). Unfortunately, there are no extensive studies on dog bite epidemiology conducted in Spain to allow closer comparisons. These findings contrast with data from veterinary behaviourists, where owners are considered the most common target of dog aggression. In one study, on dominance related aggression, aggression towards family members accounted for 62% of all aggressive dogs that were referred to behavioural specialists (Landsberg 1991). The higher proportion of dogs showing aggression towards people found in the caseloads of veterinary behaviourists may again reflect aspects more related to the owner's perception, rather than to the nature of the problem itself; aggression directed to themselves could be more difficult to tolerate by dog owners than the one directed towards non-familiar people or other dogs.

Regarding feline behavioural problems, this study found that inappropriate elimination was considered the most frequent behavioural complaint; this finding is consistent with data from most animal behaviourists. Inappropriate elimination was considered the most common diagnosis by 29 small animal behaviourists (49% of all consultations) (Overall 1997a). Data from the Behavioural Services of the Veterinary Teaching Hospital at the Barcelona School of Veterinary Medicine also indicated that inappropriate elimination was the main behavioural complaint in cats (40% of all consultations) (Fatjó *et al* 2002).

This study found that feline aggression was considered the second most frequent behavioural problem seen by small animal behavioural specialists. In the 1996 study, cited in Overall 1997a, of 29 behaviour specialists, aggression accounted for 35% of all feline cases; an estimation almost identical to the one observed at the Barcelona School of Veterinary Medicine (36% of all consultations about feline behaviour) (Fatjó *et al* 2002).

Interestingly, in the present study furniture scratching was considered the second most common complaint. However, it should be noted that the prevalence of aggression would have been higher if both these categories included in the questionnaire had been pooled. Nevertheless, the frequency of furniture scratching was still higher than the

one given by the behavioural specialists. In fact, furniture scratching was not one of the main complaints about feline behaviour considered by veterinary behaviourists (Overall 1997a), but is very frequent in the whole cat population; in a survey conducted in the USA, furniture scratching was reported by 60% of cat owners (Morgan & Houpt 1990). It is interesting to note that all cats in this study were considered to be well-behaved pets that were never taken to the veterinarian for this reason.

Aggression in cats appears to be perceived by most owners as a rather normal and tolerable behaviour. One study indicated that during the life span of a cat, 54% exhibited hissing from once per month to once or more per week, and 60% scratched or bit people occasionally (Borchelt & Voith 1987). However, it is possible that only those showing intense aggression, or having less tolerant owners, were taken to the veterinarian.

This study found that aggression towards people was ranked higher than towards other cats; this figure differs from data collected from the databases of small animal behavioural specialists. The 1999–2000 Annual Report of the Association of Pet Behaviour Counsellors (APBC) considered aggression towards other cats (23% of all cases) to be more frequent than towards people (12% of all cases) (Heath 2002). Similarly, information from the Behavioural Services of the Veterinary Teaching Hospital at the Barcelona School of Veterinary Medicine indicated that aggression towards other cats was more frequent (65% of all aggression cases) than towards people (35% of all aggression cases) (Fatjó *et al* 2002).

On the subject of how to treat behavioural problems, Spanish veterinarians that participated in the study showed different approaches to treating the behavioural problems of dogs and cats. Behavioural modification was found to be a more effective method of treating canine, rather than feline problems. This may reflect the popular believe that the solution of canine behavioural problems is more closely linked to training than for feline problems. Castration was thought to be a more efficient method of correcting behavioural problems in cats than in dogs. This observation is consistent with the fact that the overall effectiveness of castration is higher in cats than in dogs. For example, castration has an estimated success rate of 90% for correcting urine-marking in cats, whereas it is only useful in 50% of cases of dogs with the same behavioural problem (Horwitz 2002b; Houpt 2002).

### Conclusions and animal welfare implications

The small animal veterinary practitioner is usually the first professional consulted regarding a behavioural problem. According to the data from this study, some differences could exist between the prevalence of behavioural problems estimated by small animal veterinary practices and specialist behavioural referral centres. Epidemiological studies conducted from the perspective of the veterinary practitioner can help to improve and focus preventive and educational programs on those complaints most frequently reported by pet owners and this could help to increase the welfare of companion animals through a reduction in the abandonment and euthanasia of dogs and cats.

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