Original Scientific Article

SHELTER DOGS AND THEIR DESTINY A RETROSPECTIVE ANALYSIS TO IDENTIFY PREDICTIVE FACTORS: A PILOT STUDY

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ABSTRACT

Consequences of a long stay in dog shelter have particular significance, because, since 1991, the Italian law (14/08/1991, n.281) prohibits euthanasia of dogs unless "they are seriously ill, incurable or proven dangerous". Caught dogs are recovered for a quarantine period in the sanitary kennel, if they are not returned to the owner, they are moved to shelters until adoption or death. The aim of this work was to identify the relationship between dogs characteristics and their destiny in order to define useful predictors to better manage the stay of dogs in shelter. We analysed the records of all dogs recovered in a sanitary kennel from 2005 to 2010 and subsequently moved to shelters (n=771). Descriptive and inferential statistics were performed in order to investigate possible factors that might affect adoptability of sheltered dogs. The characteristics of dogs that spent more time in PVCS, before being transfer to the CR, were: large size, male gender and age between 11 months and 2 years (p ≤ 0,05). Male dogs spent more days in CR, as opposed to female (p ≤ 0,05). In our sample 76% dogs were adopted, 18% were still in the shelter, 4% died and 2% were euthanized. Female dogs were adopted more than males; young dogs more than elderly (over seven years); sizes medium and small more than large. It would be interesting use the data from this research and complete them with information regarding dogs behaviour, to better manage dogs during the stay in shelter and to improve their relocation.

Key words: dog, shelter, welfare

INTRODUCTION

Dogs (*Canis familiaris*) are considered one of the most popular and common companion animals (1, 2). Is estimated that dogs population in Italy is about 7 million (3). In recent decades, growth in demand for pet dogs led to a real explosion of their population, partially powered by the development of dog breeding and domestic litters.The amount of money that people are prepared to spend on their animals' management and health has been growing over the years (4, 5); but multiple factors can interfere on human-animal bond (e.g. behavioural problems). Once the bond is broken, the dog may end up on the street or may be taken directly to a shelter (1). In fact, problematic behaviours showed by dogs can result in abandonment, relinquishment or euthanasia (6).

In the last twenty years many studies were carried out to focus on how tomanage canine overpopulation in different countries, with the aim of identifying solutions, other than euthanasia,for unwanted pets (7, 8, 9, 10). In Italy, sheltered dogs and their welfare are issues of increasing public concerns and interest. Consequences of a long stay in dog shelter have particularsignificance because, since 1991, the Italian law (14/08/1991, n.281) prohibits euthanasia of dogs unless "they are seriously ill, incurable or proven dangerous".

Furthermore, the Italian law 281 of 14/08/1991 provided rules on dog identification: all the owners had to tattoo their dog. In 2003, a new law (State-Regions Agreementon the welfare of pets and pet therapy, 6/02/2003) substituted the tattoo identification with an electronic one, using injectable transponders. Data from injectable transponders are

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managed by regional and local health authorities (ASL) and recorded in on-line database, called National Canine Registry.

In the National Canine Registry are rregistered the identification data of the dogs: progressive number; date of entry in PVCS; breed; date of born; sex; size; system of entry into PVCS; microchip anddate of transfer to CR.

Caught dogs are placed for a quarantine period (according to 281/91 Italian law, the quarantine period is minimum10 days) in the sanitary kennel; after this period, if they are not returned to the owner or adopted, they are moved to shelters where they will remain until the adoption or death. There are many variables that can influence the length of the stay of a dog in a shelter; among these we can identify age, gender, size, behavioural problems and management of the dog. Furthermore, several aspects of life in kennels often lead to behavioural disorders (e.g. separation anxiety) and increase the possibility that adopted dogs are subsequently brought back in shelter (11).

The behaviour and welfare of sheltered dogs is nowadays a growing concern in public as well as scientific opinion. Negative effects on the welfare of dog are multiple and often obvious, resulting in social isolation (12) and in confined spaces (13). Animals forced to live in environments with spatial and social constraints, especially if left in this condition for a long time, tend to develop behavioural problems such as aggression and stereotyped behaviour (14).

Shelter dogs are strongly exposed to different stressors (15), like high noise (16), distortion of the routine, new environment, lack of interactions with conspecifics and humans, prolonged confinement in limited spaces (15) and in general the lack of environmental control (11).

The aim of this study was to investigate possible relationships between dogs' characteristics and their destiny, in order to identify predictors that could be usefully considered to better manage the stay of the dogs in shelter and avoid failures in adoptions.

MATERIALS AND METHODS

Subjects

We analysed the records of all dogs admitted in a big city sanitary kennel (hereafter indicated as PVCS) from 2005 to 2010 and subsequently moved to shelters (hereafter indicated as CR) (n=771).

Data collection

For each dog we reported the identification number, date of entry into PVCS, box of hospitalization, breed prevalent, presumed date of

birth, sex, size (small: <10kg; medium: 10-25kg; large: >25kg), system of entry into PVCS (caught or found dog; entrusted dog for hospitalization or detention or death of owner; abducted dog for abuse; surrendered dog by owner) and microchip number. Moreover we noted the date of transfer from PVCS to the shelter, date of death or euthanasia, dates of adoption, dates of eventual return in the shelter and subsequent adoptions, eventual reported bite. All these data were collected by consulting paper records from the sanitary kennel and on-line records from the national canine registry.

Statistical analysis

Descriptive and inferential statistics were performed using SPSS 19.0 in order to describe our sample and identify relationships between variables.

The Mann-Whitney U test for independent samples was used to test the influence of the gender factor on the days spent in PVCS and CR and the Kruskal-Wallis test for independent samples was used to identify the influence of age, size, breed and system of entry, on the days spent in PVCS and CR.

These analyses allowed us to delineate the characteristics of adopted dogs, of dogs that are still in CR, which died or were euthanized.

RESULTS

Relevant variables with respect to time of permanence in PVCS

The sample consisted of 452 males and 319 females. 286 dogs were mixed breed and 485 were pure breed. The most numerous age categories of dogs entering in PVCS were between 11 months and 2 years and between 3 and 7 years and the most frequent size was medium.

The average stay in PVCS for the dogs of the sample was 35.71 days (ds 37.09), with a minimum of 10 days and a maximum of 382 days.

Taking into consideration all the cases in our sample, dogs that spent more time in PVCS, before being transfer to the CR,were represented by large dogs that spent a mean of 44.7 (±40) days, as opposed to medium and small dogs that spent respectively a mean of 31.7 (± 31) and 25.6 (± 38) days (p ≤ 0,05) (Figure 1).

Dogs that entered into PVCS aged between 11 months and 2 years, stay longer in PVCS (45 ± 35 days) then any other age categories such as dogs aged less than 3 months remains in PVCS, fewer days than the other age categories (9.1 ± 13 days) (p ≤ 0,05) (Figure 2).

Sex of dog has little influence on stay in PVCS, but, on average, males (40.3 ± 40 days) stay longer than females (29.2 ± 32days)(p ≤ 0,05) (Figure 3).
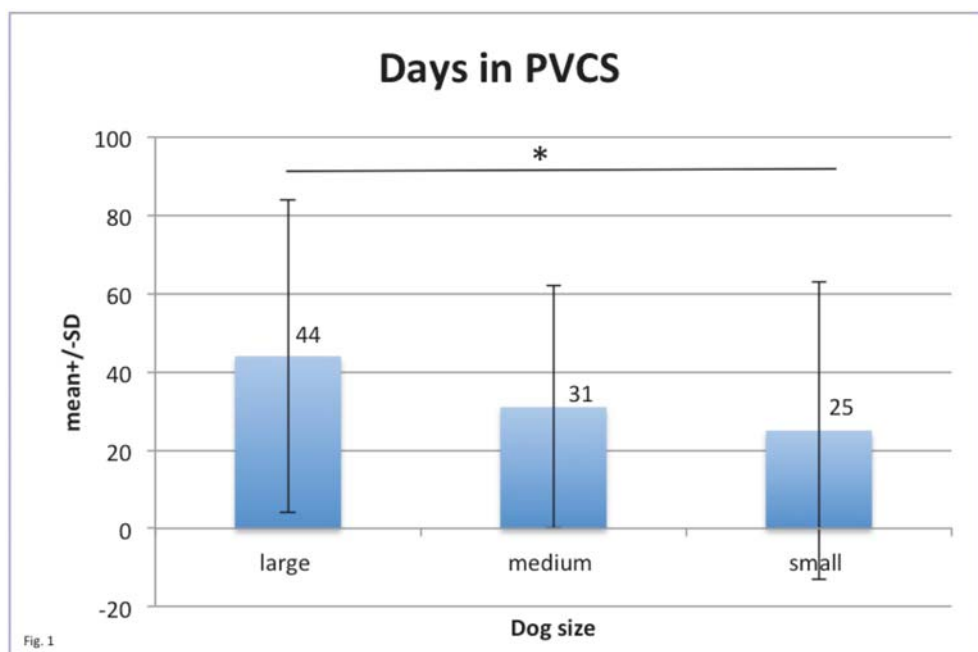
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Days in PVCS
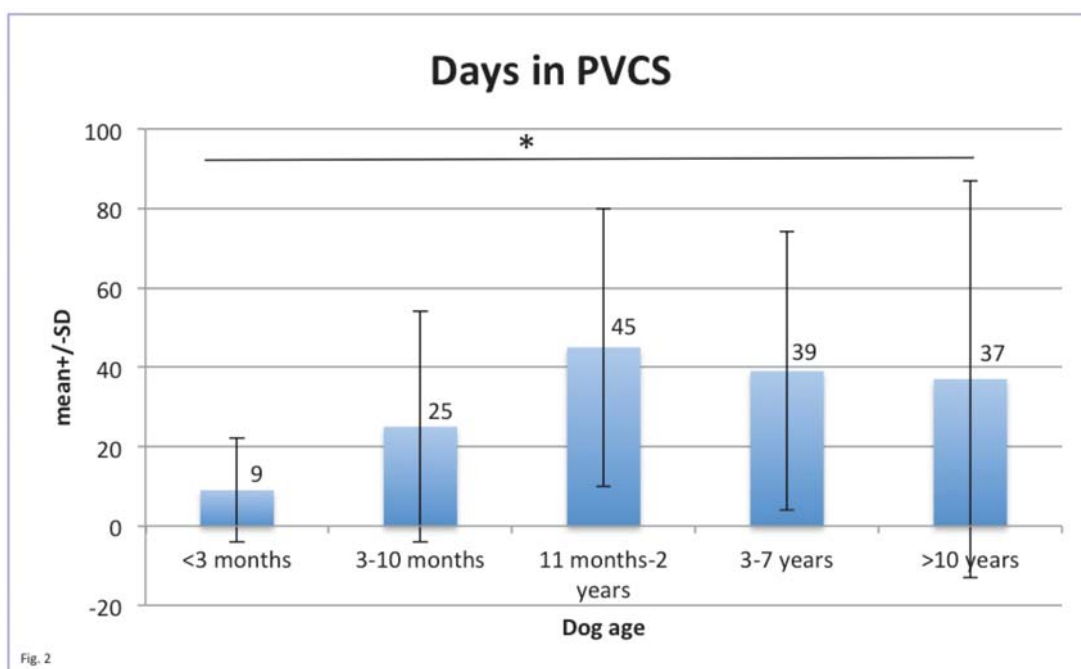

Figure 1. Days in PVCS of dogs sorted by size (Mean ± SD)

Days in PVCS

Figure 2. Days in PVCS of dogs sorted by age (Mean ± SD)

The destiny of the sample after the transfer in CR

In our sample 76.6% dogs were adopted, 17.4% were still in the shelter, 4.3% died and 1.6% were euthanized for medical reason. Female dogs were adopted more than males (85,5% versus 71,5%); dogs over seven years were adopted less than all of others age categories (58%); medium (84%) and small (88%) size dogs were adopted more than large (64%). Male dogs spent a mean of 1139 (±895) days in CR, as opposed to female that spent a mean of 631 (±744) days (p ≤ 0,05) (Figure 4).

Forty-three dogs (6% of the sample) were returned to the shelter once; these dogs were mostly large size males, between 11 months and 2 years of age. A 28 dogs of these dogs (4% of the sample)
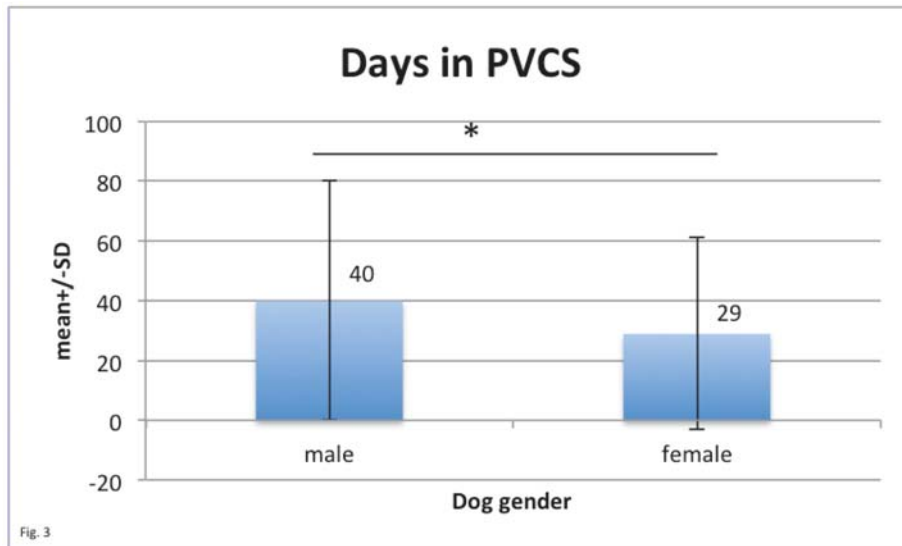
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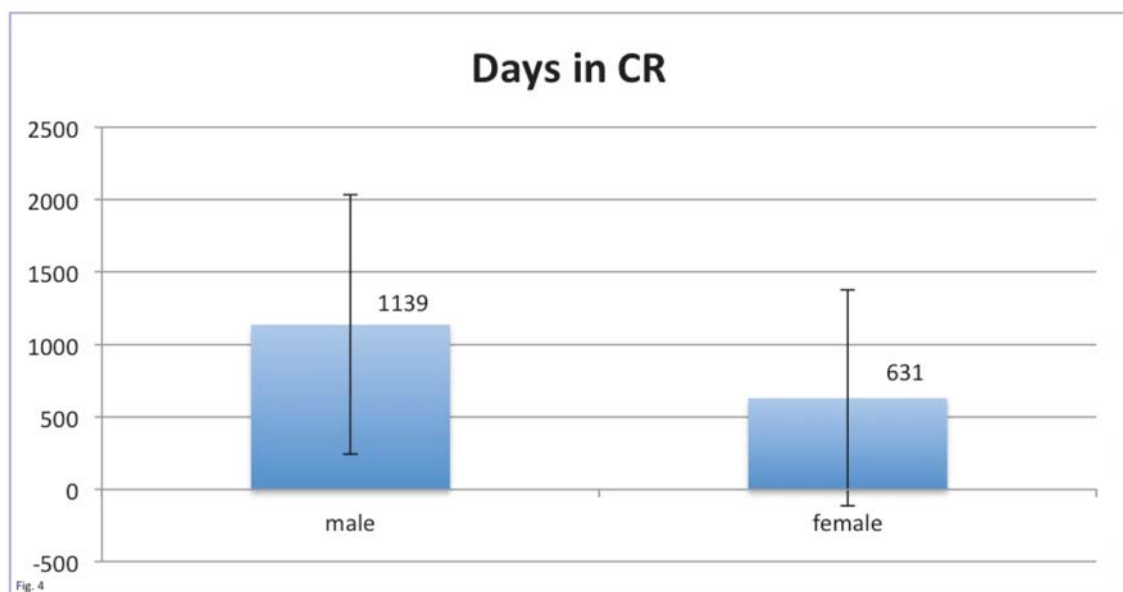**Figure 3.** Days in PVCS of dogs sorted by sex (Mean ± SD)

Figure 4. Days in CR of dogs sorted by sex (Mean ± SD)

were adopted again and 15 of these dogs (2% of the sample) were no longer adopted and are still in CR. Dogs returned to shelter more than once are 1% of the sample (8 dogs); 3 (0,4% of the sample) of these dogs were adopted and 5 (0,75%of the sample) were no longer adopted and are still in CR.

The analysis of the data showed that the regime of entry into PVCS is not a clear predictor factor: the regime of entry and destiny of each dog are not significantly related and vary from year to year.

The sub-group of dogs that were euthanized while in CR was relatively small. Beyond the specifics of each case, it is interesting to note that

no dogs under 10 monthswere euthanized, while for sex, breed and regime of entry is not possible to find particular elements of recurrence.

DISCUSSION

The laws in Italy (Law 281/1991) do not have restrictions in terms of custody of the dogs in kennels and shelters, except in special cases (dogs seriously ill, incurable and proven dangerous). This, even if in accordance with an ameliorative/evolutive approach, it is often leading to overcrowding in

these facilities, potentially damage the quality of life of dogs in shelter, which is already less aligned with physiological and ethological needs of dogs.

Recognizing the most significant variables about shelter dogs destiny would allow to better identify risk factors in order to avoid failures in adoptions.

Our data show that large dogs, dogs caught by kennel operators or found by citizens remain longer in PVCS before being transfer to the CR. Moreover, dogs aged less than 3 months remain in PVCS, on average, less than other age categories. This latter consideration indicates that the puppies have moved more quickly to the CR than older dogs; this is because often the shelter chooses, from the list of dogs to transfer, those involving minor management issues.

Our data shows that female dogs were adopted more than males, young more than elderly (over seven years), medium and small size more than large.

Although there is little in the literature about the influence of sex on dog's adoptability, our findings show that female dogs are choose relatively more than males.

As suggested by Mondelli et al. (1), probably adopters faced more difficulties in managing males because males tend to be more independent and show less-appreciated aspects such as inter-male aggression, sexual problems, and straying tendencies (2). Moreover be sexually intact is associated with a significantly increased risk of relinquishment (17).

Our results are in agreement with Mondelli et al. (1) that report that age affected the stay in shelter. Moreover, in agreement with the results of Lepper et al. (18) and Normando et al. (19), we found that young and adult dogs are adopted relatively more than the elderly (over 7 years of age). Puppies and young dogs are generally preferred to elderly dogs for adoption.

Several studies show that small and medium size dogs are adopted more frequently than those of large size (20, 21), probably because the small and medium size dogs are easier to manage.

With regard to the regime of entry into the sanitary kennel, our study does not seem to provide useful input to the identification of a mode that support the adoption, while the results of Notaro (22), show that the regime of entry into kennel is a valid indicator of desirability of the animal: dogs brought by owner seem to be adopted more easily than those captured by a kennel operator.

The percentage of returned dogs after the first adoption is very low, considering the total sample; this percentage is lower than one of reported in Mondelli's study (1).

According to Martsonand Bennet (14), a factor that negatively influences the risk of falls in kennels and then further withdrawals is the adoption of dogs is advanced age. Our results show, in agreement with Weng et al. (23), an inverse association between age and failure of adoption: dogs returned to shelter one or more times are aged between 11 months and 2 years, mostly male of large size.

In this research were not collected information on the behaviour of dog, however, several studies report a significant correlation between the presence of behavioural disorders and failure in adoption (1, 2). One study has shown that dogs relinquished to shelters have a higher incidence of aggression compared with dogs remaining in homes (24).

Early recognition of some variables potentially significant with respect to the destiny of the dog, would develop more consistent attention, supervise particularly delicate passages and generally improve the conditions of life of the dog in and out of the shelter.

It would be interesting to use the data from this research and complete them with information pertaining to the behaviour of the dogs in the shelter, to better define the profiles, to better manage the dogs during the stay in shelter and to improve their relocation.

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