



A systematic review and meta-analysis of the proportion of dogs surrendered for dog-related and owner-related reasons



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ABSTRACT

Companion-animal relinquishment is a worldwide phenomenon that leaves companion animals homeless. Knowing why humans make the decision to end their relationship with a companion-animal can help in our understanding of this complex societal issue and can help to develop preventive strategies. A systematic review and meta-analysis was conducted to summarize reasons why dogs are surrendered, and determine if certain study characteristics were associated with the reported proportions of reasons for surrender.

Articles investigating one or more reasons for dog surrender were selected from the references of a published scoping review. Two reviewers assessed the titles and abstracts of these articles, identifying 39 relevant articles. From these, 21 articles were further excluded because of ineligible study design, insufficient data available for calculating a proportion, or no data available for dogs. Data were extracted from 18 articles and meta-analysis was conducted on articles investigating reasons for dog surrender to a shelter ($n=9$) or dog surrender for euthanasia ($n=5$). Three studies were excluded from meta-analysis because they were duplicate populations. Other reasons for excluding studies from meta-analysis were, (1) the study only investigated reasons for dog re-relinquishment ($n=2$) and (2) the study sample size was <10 ($n=1$). Two articles investigated reasons for both dog surrender to a shelter and dog surrender for euthanasia. Results of meta-analysis found owner health/illness as a reason for dog surrender to a shelter had an overall estimate of 4.6% (95% CI: 4.1%, 5.2%). For all other identified reasons for surrender there was significant variation in methodology among studies preventing further meta-analysis. Univariable meta-regression was conducted to explore sources of variation among these studies. Country was identified as a significant source of variation ($p < 0.01$) among studies reporting behavioural problems as a reason for dog surrender for euthanasia. The overall estimate for studies from Australia was 10% (95% CI: 8.0%, 12.0%; $I^2 = 15.5\%$), compared to 16% (95% CI: 15.0%, 18.0%; $I^2 = 20.2\%$) for studies from other countries.

The present systematic review and meta-analysis highlights the need for further research and standardization of data collection to improve understanding of the reasons for dog relinquishment.

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1. Introduction

Companion-animal relinquishment is a complex societal issue resulting in homeless animals around the world. It is estimated that over 4 million companion animals enter U.S. shelters annually (National Council on Pet Population Study and Policy [NCPSP], 2009), over 500,000 in Japan (Hart et al., 1998), and over 140,000 in Canada (Canadian Federation of Humane Societies [CFHS], 2010). There has been much debate over this issue, including discussions about its underlying causes and optimal solutions. In order to promote and implement programmes and policies to reduce companion-animal relinquishment, awareness and understanding of the issues leading to companion-animal relinquishment is important.

Companion-animal relinquishment has been defined as when an owner voluntarily gives up ownership or possession of their pet, and includes surrender, euthanasia, and abandonment (Coe et al., 2014). Companion-animal surrender involves an owner giving up all legal claims to ownership of an unwanted pet to an animal shelter, municipal pound, or veterinary clinic (Coe et al., 2014). Understanding why companion animals are surrendered to humane organizations by their owners is a critical step in addressing companion-animal relinquishment (Casey et al., 2009). The role of the human–animal bond (HAB) in the companion animal–owner relationship has been discussed (Case, 1982; Peterson, 2006; Scarlett, 2007), and if the bond is broken, consequences may include animal welfare issues (lack of care, isolation of the dog), public health concerns (stray dogs, risk of dog bites), and relinquishment or euthanasia of homeless companion animals and the negative public perception associated with it.

A scoping review on the breadth and depth of existing literature on the topic of companion-animal relinquishment found that, among 115 primary research articles published worldwide, the majority focussed on dogs (87.8%) (Coe et al., 2014). In addition, the majority of articles included investigation of the reasons for companion-animal relinquishment (73.0%). The reported proportions of reasons for dog surrender have varied between studies. For example, Salman et al. (1998) reported in one study that 7% of dog surrenders were because the owner was moving, whereas, another U.S. study reported that moving was the stated reason for dog surrender in 48.4% of cases (Adkins, 2008). This variation among studies makes it difficult for stakeholders and policy-makers, who are seeking evidence-based information, to make fully-informed policy decisions and to target intervention strategies addressing companion-animal relinquishment. It would be helpful to have an accurate estimate of the reported reasons from the empirical research to provide more exact information to guide evidence-based policy decisions as well as future research in the area.

Systematic reviews are a form of synthesis research that uses transparent and systematic methods to identify, select, and critically appraise research studies to answer a clearly formulated question (Higgins and Green, 2011). When appropriate, combining the results from independent studies (meta-analysis) provides a more precise

estimate of the outcome measure of interest (overall estimate) (Higgins and Green, 2011).

The objectives of this systematic review and meta-analysis (SR-MA) were to establish an overall estimate of the proportion of dogs surrendered by reason for relinquishment, and to characterize the amount and sources of heterogeneity in the estimates across studies.

2. Materials and methods

2.1. Literature search

A description of the electronic search strategy, conducted as part of a scoping review, to identify primary research for inclusion in the current study is available from Coe et al. (2014). A language restriction was imposed at this level to include English articles only. In addition, the reference lists of 77 reviews and commentaries on companion-animal relinquishment identified by the scoping review (Coe et al., 2014) were hand-searched to identify unpublished studies investigating reasons for dog surrender for the current study.

2.2. Study selection and eligibility criteria of the previous scoping review

Identified citations and articles from Coe et al. (2014) included in the present study were managed in DistillerSR software (DistillerSR, Evidence Partners, Ottawa, CA).

2.3. Study selection for systematic review

In the current systematic review, study selection was based on the research question “What is the reported proportion of dogs surrendered for dog-related and owner-related reasons?” The review team consisted of the first author and two research assistants. The 115 relevant primary research articles on companion-animal relinquishment identified by Coe et al. (2014) were included for relevance screening and study selection. A pilot test of the relevance screening tool was performed on 10 articles applying the inclusion/exclusion criteria. Disagreements were discussed and the reviewing proceeded because a kappa value >0.8 was achieved. The titles and abstracts of the remaining 105 articles were then assigned to two reviewers (a research assistant and the first author) to independently screen for relevance. The reviewers discussed conflicts and came to agreement by consensus. If consensus could not be reached, then the second author (JBC) was involved to assist in resolving the conflict. Primary-research articles identified in the scoping review were considered relevant for this SR-MA if they investigated one or more reasons for pet surrender. If this criterion was not met, articles were excluded. If relevance was unclear, then the full article was procured and independently reviewed by both reviewers for relevance.

2.4. Inclusion and exclusion criteria for systematic review

Following relevance screening, a second level of screening was based on the full articles and was included

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