# Special Report

# A systematic review of the effects of euthanasia and occupational stress in personnel working with animals in animal shelters, veterinary clinics, and biomedical research facilities

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**Background**—The study of occupational stress and compassion fatigue in personnel working in animal-related occupations has gained momentum over the last decade. However, there remains incongruence in understanding what is currently termed compassion fatigue and the associated unique contributory factors. Furthermore, there is minimal established evidence of the likely influence of these conditions on the health and well-being of individuals working in various animal-related occupations.

**Objective**—To assess currently available evidence and terminology regarding occupational stress and compassion fatigue in personnel working in animal shelters, veterinary clinics, and biomedical research facilities.

**Data Sources**—Studies were identified by searching the following electronic databases with no publication date restrictions: ProQuest Research Library, ProQuest Social Science Journals, PsycARTICLES, Web of Science, Science Direct, Scopus, PsychINFO databases, and Google Scholar. Search terms included (euthanasia AND animals) OR (compassion fatigue AND animals) OR (occupational stress AND animals).

**Study Appraisal and Synthesis**—Only articles published in English in peer-reviewed journals that included use of quantitative or qualitative techniques to investigate the incidence of occupational stress or compassion fatigue in the veterinary profession or animal-related occupations were included. On the basis of predefined criteria, 1 author extracted articles, and the data set was then independently reviewed by the other 2 authors.

**Results**—12 articles met the selection criteria and included a variety of study designs and methods of data analysis. Seven studies evaluated animal shelter personnel, with the remainder evaluating veterinary nurses and technicians (2), biomedical research technicians (1), and personnel in multiple animal-related occupations (2). There was a lack of consistent terminology and agreed definitions for the articles reviewed. Personnel directly engaged in euthanasia reported significantly higher levels of work stress and lower levels of job satisfaction, which may have resulted in higher employee turnover, psychological distress, and other stress-related conditions.

**Limitations and Conclusions**—Results of this review suggested a high incidence of occupational stress and euthanasia-related strain in animal care personnel. The disparity of nomenclature and heterogeneity of research methods may contribute to general misunderstanding and confusion and impede the ability to generate high-quality evidence regarding the unique stressors experienced by personnel working with animals. The present systematic review provided insufficient foundation from which to identify consistent causal factors and outcomes to use as a basis for development of evidence-based stress management programs, and it highlights the need for further research. (*J Am Vet Med Assoc* 2015;247:1121–1130)

In 1992, Carla Joinson,[1] a registered nurse, introduced the term compassion fatigue while studying burnout in emergency department nurses. Joinson stated, "compassion fatigue is a unique form of burnout which affects people in caregiving professions; where burnout is overpowering, invasive stress that can begin to dominate us and interfere with our ability to function." Since then, there have been many studies published evaluating compassion fatigue in the human healthcare field.[2–6] Each study used either new definitions or variations and permutations of the existing nomenclature associated with occupational stress.

Subsequently in 1995, Charles Figley[3] described compassion fatigue as equivalent to secondary traumatic stress and defined it as the caregiver's reduced capacity or interest in being empathic or "bearing the suffering of clients" and being "the natural consequent behaviors and emotions resulting from knowing about a traumatizing event experienced or suffered by a person."[3] There is

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a substantial body of evidence on occupational stress in personnel working in human health care and, to a lesser extent, in animal health care. Professionals who work with people or animals, particularly those who are suffering, must not only cope with the normal stress or dissatisfaction of work but also with their personal feelings and emotional response to that suffering. This has been suggested[7] to result from a combination of exposure to several work environment factors (eg, lack of resources) and employment conditions (eg, role overload) and is thought to be cumulative; if not addressed, then feelings of physical and emotional exhaustion, depression, and reduced personal achievement may become a constant.[7]

Individuals working in veterinary clinics, animal shelters, and research facilities perceive the euthanasia of animals for the relief of suffering or for human convenience (eg, controlling overpopulation and working within financial constraints, or within prescribed laboratory management parameters) as one of the main causes of occupational stress.[8–10] Euthanasia within these occupational contexts may be a daily occurrence, and discussions typically focus on topics such as the number of animals killed, the rationale for killing, or the methods used.[11] There has been minimal exploration of the emotional effects of euthanasia on those working with or caring for these animals. In 2006, Figley[12] published *Compassion Fatigue in the Animal Care Community*; this book was developed from his work within the human health care field and initiated the extrapolation of existing nomenclature to caregivers in animal-related professions. However, consistent with the human health-care field, no agreed definition of compassion fatigue currently exists for animal care workers or veterinarians, creating confusion about the concept as well as any differences that may exist between compassion fatigue and other forms of occupational stress. Within this area of study, where many terms, symptoms, and conditions are often used interchangeably, this lack of definitional consensus contributes to the difficulty in identifying those who may be experiencing mental health issues induced or exacerbated by the work that they do. This further invites the question as to what specifically constitutes compassion fatigue for those who work in veterinary clinics, animal shelters, and research facilities, versus in human health care, and whether the current interpretation of compassion fatigue is valid within these occupational contexts.

Compassion fatigue in animal-related professions is most often considered to be a direct result of the impact of euthanasia. However, evidence to date suggests that negative feelings are also induced by other common occupational stressors such as client financial constraints, employee workload, long-term care of patients with chronic diseases, and end-of-life care.[2,3,12–16] Compassion fatigue and the associated negative feelings can also be compounded by feelings of failing a patient, the client, or both.[2,3,10,11,14–16] There is increasing dialogue on occupational stigma and the negative perception of various animal-related work tasks including, broadly, the decision to euthanize, the use of animals in research, and the global push toward the ideals of no-kill animal shelters.[9,14–18] This stigma may further compound the effects of occupational stress and compassion fatigue and lead to emotional dissonance and the potential for emotional contagion not only between those directly involved in these tasks but also to ancillary and support staff such as receptionists and other office workers.[9,14–18]

Since the publication of Figley's book[12] in 2006, there have been a number of studies on occupational stress, compassion fatigue, and secondary posttraumatic stress disorder in the animal care community. Predominantly, this research has been performed in the United States and to a lesser extent in the United Kingdom. Furthermore, the majority of studies focused on animal shelter and laboratory animal environments. As such, it may not be valid to directly apply the results of these studies and the recommendations made by the authors to the veterinary and biomedical research fields worldwide.

Therefore, the present systematic review focused on a subset of specific animal-related occupations in which people may be affected by euthanasia-related stress and occupational stress. These occupations were divided into 2 groups: companion animal caregivers (ie, veterinarians, veterinary nurses and technicians, shelter workers, and animal control attendants) and laboratory animal caregivers (ie, researchers and laboratory animal technicians). Whereas both categories have vastly different occupational contexts, strong evidence exists that little if any difference in levels of euthanasia-related stress and occupational stress symptoms occurs between the 2 types.[9] It has been our experience that most people who work in these fields do so because they love animals and feel an affinity with them. They are rarely aware of the extent to which they will be required to kill animals. Those who work with animals where euthanasia is frequent suffer what Arluke[19] has described as the "caring-killing paradox." They experience moral stress.

The objectives of the systematic review reported here were to review the literature on occupational stress and compassion fatigue in workers in veterinary clinics, animal shelters, and research facilities; to facilitate assessment of currently available evidence regarding occurrence and causal factors; and to review the current use of terminology.

## Materials and Methods

The study was conducted and reported in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement for transparent reporting of systematic reviews.[20] The PRISMA checklist was completed (**Online Supplement eTable 1**; available at avmajournals.avma.org/toc/javma/247/10).

**Eligibility criteria**—Studies were eligible for inclusion if they investigated occupational stress or compassion fatigue in the animal or veterinary field and were published in peer-reviewed journals in English. All study designs in which authors included use of qualitative or quantitative methods were eligible. Qualitative studies were defined as those that utilized open-ended questions to elicit information that was narrative in nature. Quantitative studies were defined as those that utilized data collection methods that required formal statistical analysis. Mixed method studies utilized both statistical and narrative reporting methodologies. No publication date restrictions were imposed.

**Information sources**—Studies were identified by searching the following electronic databases between

January 17 and February 7, 2014: ProQuest Research Library, ProQuest Social Science Journals, PsycARTICLES, Web of Science, Science Direct, Scopus, and PsychINFO. A search was also conducted via Google Scholar. In addition, the reference lists from each of the studies initially included in this review were searched to identify any additional eligible studies.

**Search**—The search strategy was determined prior to study commencement including consensus between authors for search terms. The search terms were as follows: (euthanasia AND animals) OR (compassion fatigue AND animals) OR (occupational stress AND animals). The full electronic search strategy for ProQuest Social Science is provided (**Appendix**).

**Study selection**—The title and abstract of all articles obtained via the search strategy as described were assessed independently by 1 author (RS). Abstracts of articles that initially appeared relevant were imported for assessment of suitability. The full text of each identified article was obtained and read in full by the first author (RS) and subsequently independently reviewed by the other 2 authors (DM and HK). Articles were excluded if they related to human health caregivers or if they described occupational stress or compassion fatigue but did not include any formal evaluations. Studies were also excluded if they addressed an unrelated subject or focused on management strategies or coping mechanisms.

**Data collection and evaluation**—One author (RS) extracted data of interest from eligible studies and and both coauthors (DM and HK) checked the data. Any disagreements were resolved by means of consensus. Eligible studies were not evaluated for indicators of study quality, and because of the variability of study designs (quantitative, qualitative, and mixed methods) a valid assessment of bias could not be conducted. A metaanalysis was not performed.

## Results

**Study selection**—Twelve studies met the inclusion criteria. The search strategy identified 2,694 articles for preliminary screening. On prescreening the title and abstracts, 2,604 articles were identified as irrelevant, yielding 90 papers. After elimination of 14 duplicate articles, 76 were identified for full review. Thirty-eight articles did not meet the eligibility criteria because they focused on grief and stress management in general, whereas another 26 were excluded because they were related to human health caregivers, were editorials, did not include any formal evaluations, or addressed a subject outside the scope of this review (eg, suicide; **Figure 1**).

**Study characteristics**—There was considerable variation in research design among the 12 studies included in this systematic review. The method of participant recruitment and the way in which data were analyzed and reported also varied. Three studies used quantitative methods,[14,21,22] 5 were qualitative studies,[11,17,23–25] and 4 used a mixed-methods approach.[9,15,16,18] Two studies were conducted in Australia,[9,14] and 1 study was concluded in the United Kingdom,[17] with the remaining studies conducted in the United States. Seven of the studies recruited participants from the animal shelter environment, whereas 2 evaluated veterinary nurses or technicians.[14,15] There were 2 studies that recruited participants from multiple occupations, including animal shelter workers and animal control officers,[18] research technicians, veterinarians, and veterinary nurses,[9] and 1 study that evaluated only biomedical research technicians.[17]

### Quantitative studies

Study objectives, research design, and outcome measures for the 3 studies[14,21,22] that were conducted with quantitative methodologies were summarized (**Table 1**). The first formal evaluation of euthanasia-related strain was conducted in 2001 (wave 1 data) and 2002 (wave 2 data) and was described by Reeve et al.[21] Funded by the Humane Society of the United States, recruitment of individuals involved with animal welfare and control was undertaken at 2 consecutive annual Animal Care Expos in the United States. This cross-sectional study utilized a multisection survey, which included all or parts thereof from various assessment scales (ie, a Modified Euthanasia Attitude Scale developed from an Abortion Attitudes Scale,[26] Overall Job Satisfaction Scale [adapted],[27] Job in General Scale,[28] Job Descriptive Scale,[29,30] Work-Family-Conflict Scale,[31] Substance Use,[32] Euthanasia-Related Strain Scale,[20] and Somatic Complaints Scale).[33] The authors of this study[21] reported that for individuals engaged in animal euthanasia, there is a perception that euthanasia-related strain manifests in many diverse forms, from effects on concentration to a direct influence on feelings of happiness and self-worth. Whereas euthanasia-related strain was perceived as a qualitatively distinct type of workplace stress, the intensity can both con-

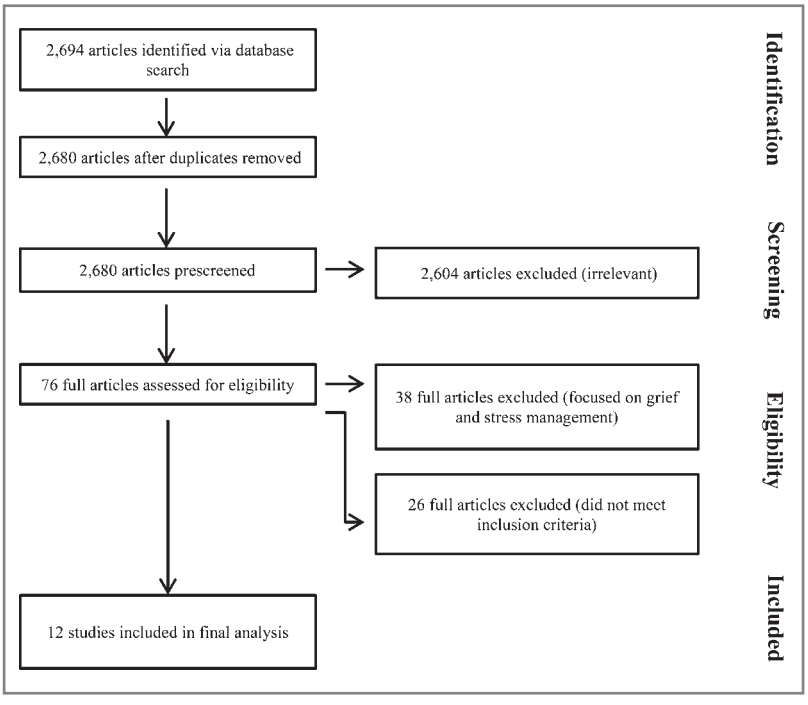


Figure 1—Study flow diagram depicting study selection and inclusion criteria for a systematic review of the effects of euthanasia and occupational stress in personnel working with animals in animal shelters, veterinary clinics, and research facilities.

Table 1—Summary of study characteristics for quantitative studies[14,21,22] identified in a systematic review of the effects of euthanasia and occupational stress in personnel working with animals in animal shelters, veterinary clinics, and research facilities.

| Source | Setting | Sample size | Objectives | Research design | Outcome measures |
|---|---|---|---|---|---|
| Black et al (2011)[14] | Veterinary nurses | 127 | 1. To investigate levels of occupational stress in veterinary nurses, using measures and a theoretical framework<br>2. To examine the possible influence on veterinary nurses' occupational stress of both euthanasia workload and attachment to their own companion animal | Postal questionnaire | Psychological distress<br>Work burnout<br>Job satisfaction<br>Attachment to animals |
| Reeve et al (2005)[21] | Animal care | 335 | 1. To obtain descriptive data regarding animal shelter employee perceptions of euthanasia-related strain (ERS) on their well-being<br>2. To investigate how an employee's attitude toward euthanasia as a practice relates to ERS and well-being<br>3. To gain an understanding of work and organizational differences that may be associated with reactions to performing euthanasia | Multi-section Likert survey | Level of perceived euthanasia-related strain<br>Personal well-being<br>Job satisfaction |
| Rogelberg et al (2007)[22] | Animal shelter employees | 36 | To examine the effects of euthanasia rates, euthanasia practices, and human resources practices on the turnover rate among employees with euthanasia responsibilities at animal shelters | Cross-sectional study using novel survey | Euthanasia practices<br>Euthanasia rate<br>Employee turnover<br>Human resources management practices |

tribute to, and be influenced by, an individual's evaluation of overall job and life satisfaction. Results suggested that euthanasia-related work is linked to a number of well-being outcomes of established importance in applied psychology (eg, posttraumatic stress and vicarious trauma).[21]

Rogelberg et al[22] recruited animal shelters from throughout the United States to examine the effects of euthanasia rates, euthanasia practices, and human resource practices on the turnover rate of employees with euthanasia responsibilities. Congruent results were identified between this study and previous research with euthanasia typically having a negative impact on an involved individual's health and well-being.[3,5,9–11,21,23] With a survey instrument devised by the researchers, this particular cross-sectional study[22] found a significant correlation between euthanasia rates and employee turnover index ($r = 0.36$, $P < 0.05$); that is, higher euthanasia rates were associated with increased employee turnover. Conversely, euthanasia rates for cats were not related to employee turnover. The authors attributed this difference to the perceived level of the shelter workers attachment to dogs being greater than that between the shelter workers and cats. The overall objective of this study was to gain insight into how shelter practices might influence employee turnover, and thus the authors evaluated euthanasia practices including availability of a designated room, absence of other live animals during euthanasia, and removal of euthanized animals prior to entry of another animal to be euthanized. An association between the use of these practices and a decrease in employee turnover was found ($r = –0.36$, $P = 0.05$; and $r = –0.33$, $P < 0.05$ respectively). In contrast, the presence of other live animals during euthanasia and, euthanasia of animals for non-medical or behavioral reasons such as breed, age, or pregnancy, was associated with increased employee turnover ($r = 0.51$, $P = 0.01$; and $r = 0.28$, $P < 0.05$ respectively). Although a number of robust predictors of employee turnover were identified, the study was limited in the ability to make causal inferences because of its cross-sectional nature, the variable employee turnover between shelters, no variation in euthanasia method, and little variability in job rotation.

The first empirical study[14] investigating occupational stress in veterinary nurses in Australia was published in 2011. This study sought to "determine which environmental aspects of the work situation may be detrimental to well being and which factors may operate to reduce job stress." Participants completed a questionnaire regarding demographics, amount of contact with clients, frequency of exposure to euthanasia, and perception of job demands, control, and support. The authors concluded that veterinary nurses were at notable risk for occupational strain because many reported working in a high demand-low control environment. The authors also concluded that there was strong evidence to suggest that the impact of high job demand and low job control may be counterbalanced by positive workplace social support systems.[14] Interestingly, this study reported that greater attachment to one's own companion animal was associated with less job satisfaction rather than more.

### Qualitative studies

Study objectives and research design for the 5 qualitative studies[11,17,23–25] were summarized (**Table 2**). Arluke[11] believed it was important to immerse himself in a single US shelter facility over several months, allowing participants to feel comfortable during the interview process and to be freely observed in all aspects of shelter work. Open-ended, semistructured interviews were conducted with each shelter employee (n = 16) and focused on "exploring how shelter culture helped workers cope with the moral stress of euthanasia."[11] He reported that whereas this particular shelter may have been more concerned about how its staff dealt with euthanasia compared with other facilities, shelter culture as discussed in his article would be recognized by shelter workers in general. Analysis, although not described, was reported

Table 2—Summary of study characteristics for qualitative studies[11, 17, 23–25] identified in a systematic review of the effects of euthanasia and occupational stress in personnel working with animals in animal shelters, veterinary clinics, and research facilities.

| Source | Setting | Sample size | Objectives | Research design |
|---|---|---|---|---|
| Arluke (1991)[11] | Animal shelter | 16 | To explore how shelter culture helped workers cope with the moral stress of euthanasia | Open-ended, semistructured interviews |
| Davies & Lewis (2010)[17] | Biomedical research | 31 | To identify key themes from initial qualitative research and then use those themes to formulate a unique quantitative survey instrument exploring whether emotional dissonance occurs within animal technicians in the United Kingdom | Semistructured focus group interviews |
| Reeve et al (2004)[23] | Animal care workers | 38 | To identify turning-point events, particularly stressful or particularly positive events, that spur changes in employees' attitudes, cognition, and perceived stress regarding euthanasia-related work | Semistructured interview and retrospective narrative to elicit longitudinal autobiographical narratives |
| Rogelberg et al (2007)[24] | Animal shelter | 305 | To gather employee perspectives on what can be done to assist shelter workers in dealing with euthanasia-related stress | Survey, including broad-based open-ended questions |
| Baran et al (2009)[25] | Animal shelter | 242 | To identify and evaluate coping strategies advocated by experienced animal shelter workers who are directly engaged in euthanizing animals | Cross-sectional study using novel survery |

with general magnitude levels. Each magnitude level was assigned a percentage approximation (ie, rarely = 5%, few = 10%, some = 11% to 20%, many = 21% to 50%, most = 50% to 80%, and vast majority ≥ 81%). It was identified that shelter culture served to ease newcomers into performing euthanasia by allowing opportunities to become used to the idea before being exposed to or having to perform it. It focused on technical capabilities and defined the killing of animals as a humane act to end suffering and as a preferable alternative to living under certain circumstances. Employed as a form of self-preservation, shelter culture also may have facilitated moral shift, which is shifting the responsibility of having to kill animals away from themselves to people outside the shelter (ie, those who were seen to create the necessity for euthanasia, neglectful owners, and irresponsible owners who contribute to pet overpopulation). This moral shift also focused on workers in no-kill shelters, specifically; workers wondered how their peers could feel comfortable rejecting unadoptable animals knowing that someone else would have to euthanize them. An inner community network of social support existed and served to shield those who perform euthanasia from those who did not. Arluke[11] also discovered that the attachment of staff members to the animals was naturally formed and was an important aspect of animal care that is considered normal. However, he suggested that strategies are required to protect staff members from the potential issues caused by feelings of loss and grief. Workers who had some influence over the euthanasia selection process and over their own involvement in the act further confirmed within themselves that they were, in fact, caring people.

Reeve et al[23] conducted 38 interviews with attendees at the 2002 Animal Care Expo in Florida. More than half of the participants worked at a humane society, with the remainder employed in animal control, veterinary services, or other animal care capacities that involved euthanasia. With the objective of this study being to identify turning-point events (both negative and positive) that spur changes in employees' attitudes, cognitions, and perceived stress regarding euthanasia-related work, this study utilized unusual methodology. By means of adjustment trajectory graphs, each participant was asked to draw a trajectory line depicting "their own personal story of adjustment to euthanasia-related work."[23] The researchers then used a retrospective narrative concept and semistructured interview format to elicit longitudinal autobiographical narratives that focused specifically on interpreting each individual's graph. The authors reported that emotionally charged events were recollected particularly well over time. From 83 identified turning points, a total of 10 themes were recorded. These themes included a person's first time performing euthanasia, a euthanasia process that is technically difficult or emotionally demanding, increased influx of animals, euthanasia of healthy animals, level of technical training, decreased number of animals euthanized, reduced number of animals euthanized by an individual, improved euthanasia method and coping mechanisms, and interactions with management. Whereas this study identified a number of negative aspects associated with working in animal-related occupations that implicated a variety of workplace and organizational issues, there were also a number of positive aspects that facilitated adjustment to euthanasia-related work. Hence, whereas it is clear that adjustment to euthanasia-related work is arduous, poor adjustment is not inevitable.

Rogelberg et al[24] recruited 305 participants from 62 shelters across the United States to complete a survey investigating what recommendations shelter employees believe would assist them in coping with euthanasia-related stress. Three hundred five usable surveys were incorporated into the final analysis, which used thematic coding techniques to identify and categorize common broad themes for responses. The results of the survey indicated that euthanasia-related stress was certainly a concern to many shelter employees, as demonstrated by the high percentage (80% [244/305]) of employees who provided constructive suggestions and comments. The most frequently mentioned category involved promoting understanding and support between employees charged with performing euthanasia and those working alongside them but who were not involved with euthanasia. Availability

of professional counselors (impromptu or scheduled) was another popular suggestion with some respondents suggesting specific stress management and compassion fatigue seminars being of possible great benefit. Another category that appeared very important to employees was a belief that management should actively seek employee input regarding euthanasia-related decisions and practices. Interestingly, 3.9% (12/305) of respondents reported that they did not experience stress while, in contrast, 4.6% (14/305) felt that nothing could be done to improve euthanasia stress.

Baran et al[25] analyzed responses from 242 shelter employees recruited from 62 shelters across the United States. This study aimed to identify and evaluate the various coping strategies that were being used or advocated by experienced animal shelter employees who were directly involved in animal euthanasia. This cross-sectional study utilized a survey that requested demographic information including length of time and experience in engagement with euthanasia-related tasks. Specific information relating to coping strategies was elicited by posing an open-ended question regarding what recommendations and advice would each respondent give to someone just starting out in this career field in regard to coping with euthanasia-related work tasks. Consistent with other qualitative studies, analysis was conducted with thematic coding analysis techniques and provided 26 distinct categories of coping strategies. However, these could be reclassified into 8 broader types that fit into 2 subcategories: those relating to methods of dealing with euthanasia-related stress on the job (competence strategies, euthanasia behavioral strategies, cognitive or self-talk strategies, and emotional regulation strategies) and those related to methods of dealing with stress after conducting euthanasia-related work (separation strategies, get-help strategies, long-term solution strategies, and withdrawal strategies). The authors noted that whereas respondents were asked advice on coping strategies, they were not asked about coping strategies that were actually used, and there was no attempt to assess the effectiveness of any strategy.

Davies and Lewis[17] conducted 6 focus group interviews with employees from biomedical research facilities across the United Kingdom. These employees covered a broad range of roles, responsibilities, and years of experience. Although methods of analysis were not described, extracts of potential statements were utilized to convey themes of concern regarding the emotional challenges faced by biomedical research technicians. The aims of this study were to elicit these themes of concern and, from these, to develop a unique survey instrument that could then be used to explore emotional dissonance in animal technicians. The focus groups did provide evidence of emotional dissonance as well as probable occurrence of emotional contagion or transference of one's emotions to others. Coping mechanisms made up a considerable part of discussions across the focus groups and included topics such as volume of alcohol consumption and access to social support both within and outside the workplace. Engaging with people facing the same challenges was a popular coping mechanism. However, respondents felt that opportunities to do so were very limited. Social isolation and poor induction protocols for new staff were also high on the list of challenges within organizations. Causes of emotional dissonance within animal research facilities included type of activity engaged in (eg, animal care, scientific procedure, or euthanasia) and the species with which a person worked, with dogs, cats, and primates placed higher on the emotional plane.

### Mixed-methods studies

Study objectives, research design, and outcome measures for the 4 studies[9,15,16,18] identified as utilizing mixed methods were summarized (**Table 3**). A study by Rohlf

Table 3—Summary of study characteristics for mixed-method studies[9,15,16,18] identified in a systematic review of the effects of euthanasia.

| Source | Setting | Sample size | Objectives | Research design | Outcome measures |
|---|---|---|---|---|---|
| Rohlf & Bennett (2005)[9] | Veterinary practice, biomedical research, and animal shelter | 148 | 1. To explore possible identification of perpetration-induced traumatic stress in workers whose occupation required euthanizing nonhuman animals<br>2. To determine whether event or person-related factors influenced stress symptoms | A 22-item self-report survey including 3 open-ended questions | Level of current traumatic stress<br>Job satisfaction<br>Level of perceived social support |
| Foster & Maples (2011)[15] | Veterinary technicians | 79 | To characterize the occupational stress, health status, and coping strategies of veterinary support staff | A Web-based survey and semistructured interviews | Level of perceived occupational strain<br>Coping mechanisms<br>Personal well-being |
| Baran et al (2012)[16] | Animal shelter | 499 | 1. To demonstrate how dirty-work engagement relates to higher levels of strain, job involvement, and reluctance to discuss work while negatively influencing work satisfaction<br>2. To report the differences between the outcomes of dirty-task frequency and dirty-task psychological salience, thereby providing additional insight into the complexity of stigmatized occupations | Survey including a number of open-ended questions | Level of perceived employee strain and work burnout |
| Anderson et al (2013)[18] | Animal shelter | 54 | 1. To understand animal shelter management's perspective on staff reactions to euthanasia<br>2. To identify support programs and policies and to understand the challenges and barriers to offering such services | Cross-sectional survey (17 novel questions) including open-ended questions | Management's perception of employee reactions to participating in euthanasia |

and Bennett[9] investigating the incidence of perpetration-induced traumatic stress recruited animal workers from veterinary clinics, research laboratories, and welfare shelters in the state of Victoria, Australia, who actively participated in animal euthanasia. One hundred fifty participants responded, and 148 of those were included in the final analysis. Participants were asked to complete a 22-item self-report measure that assessed 3 broad fields of current traumatic stress, including intrusive phenomena (ie, recurring nightmares), avoidance phenomena, and hyperarousal phenomena (ie, exaggerated startle response). Participants also answered a number of questions regarding context of euthanasia, exposure to euthanasia (length of time and frequency), type and level of animal-related training, their level of concern about animal death, and social support. Participants were also asked 3 open-ended questions probing their reasons for entering their chosen profession and identifying the best and worst aspects of their current job. The quantitative data analysis served to identify participants who may have been experiencing clinically significant levels of euthanasia-related traumatic stress. Results indicated that 50% (74/148) reported symptoms that fell within a subclinical range and that no participant reported symptoms that fell within the severe range of traumatic stress. However, 39% (58/148) of participants reported stress symptoms that fell within the mild range and 11% (16/148) within the moderate range. From the qualitative data, 4 themes relating to reasons for entering the profession were identified: animal-focused, job-focused, self-focused, and career-focused reasons. Similarly, when asked to identify the best aspects of working with animals, 3 themes arose: satisfaction received from helping and caring for animals, achieving personal goals at work, and the achievement of work-related goals (eg, successfully treating the sick or finding new homes for unwanted animals). Unfavorable aspects of working with animals also elicited 3 themes: aversive work conditions (ie, the smells and mess that can be associated with animal work, the risk of personal illness and injury including zoonoses and bites); dealing with client and owner difficulties (ie, negligence and non-compliance); and animal euthanasia. The results of this study were consistent with those of previous qualitative research, which suggests that involvement in euthanasia-related tasks can evoke traumatic stress reactions in some people, while also providing further quantitative evidence of the incidence of this issue across many areas of the animal care community.

In a study by Foster and Maples,[15] a mixed-method approach was used to characterize occupational stress, health status, and the coping strategies of veterinary technicians. Data were obtained from 79 members of the Alabama Veterinary Technician Association by means of 3 validated survey instruments. The Nursing Stress Scale[34] was modified to suit the veterinary profession and assessed factors including the physical, psychological, and social environments of veterinary practice. This study also used the Short Form-36 Version 2 Health Survey,[35] which has a physical component score and a mental component score. Third, the Ways of Coping Questionnaire[36] was used to elicit thoughts and actions participants used to cope with stressful events and encounters at work. Results of the quantitative assessments indicated that this workforce experienced high stress and a heavy workload and revealed that employees tended to use coping strategies that may adversely affect their health. In the qualitative phase, semistructured interviews were conducted to collect data after survey completion. Five predetermined open-ended questions were used to elicit information and probe for further clarification as necessary. After data analysis, the authors reported 10 phenomena that supported the findings from the quantitative phase of the study. For example, they found that the duties of veterinary support staff are numerous, ever changing, and undefined; the demands on this workforce can become consuming for the dedicated professional; support staff often take the blame for negative outcomes in veterinary settings; and unhealthy coping strategies were being used to cope with stressors in the workplace. Stressors present in the veterinary setting included frequent contact with dead and dying patients, heavy workload, and conflicts with veterinarians. Moral and ethical conflicts felt by veterinary support staff may also have contributed to the mental health of this workforce.[15]

Baran et al[16] incorporated social support theory and conservation of resources theory into their study, which examined "dirty tasks" within the context of occupation as opposed to the more common perspective of taking an occupational perspective to "dirty work." That is, an occupation has many tasks, some of which may be considered disgusting, dirty, or degrading, while other tasks do not carry the same stigma. This study specifically evaluated the task of animal euthanasia performed by animal shelter workers, "demonstrating how dirty work engagement relates to higher levels of strain, job involvement, and reluctance to discuss work while negatively influencing job satisfaction."[16] Four hundred ninety-nine animal shelter workers from 62 shelters across the United States completed a survey constructed from a number of validated instruments and explored quantitative evidence relating to dirty-task involvement and dirty task-frequency. These measures were set at the beginning of the survey and were followed by the qualitative data collection, which specifically tried to assess the psychological salience of the dirty task (animal euthanasia) by posing an open-ended question: "What is the most negative aspect of your job that occurs fairly regularly?" This question was then followed by further quantitative measures that elicited information regarding employee strain, reluctance to discuss work, work satisfaction, and job involvement. The format of questioning appeared to be a purposeful method of ensuring reliability and validity of responses in relation to the dirty task being investigated. Results from this study suggested that being involved in performing a dirty task can negatively affect employee well-being and is a fundamental risk to intrinsic coping resources used to combat occupational stressors. The authors reported that higher levels of dirty-task involvement were related to higher levels of job involvement. That is, rather than withdraw from their work because of strain and dissatisfaction, employees who were tasked with dirty work had a tendency to become more immersed in their jobs.

Anderson et al[18] conducted an exploratory study with a cross-sectional survey design. Managers from 54 animal shelters across Ohio were recruited to complete

a 17-item questionnaire developed by an interdisciplinary team of experts specifically for this study. In addition to personnel and facility demographics, questions focused on management's perspectives on staff reactions to euthanasia, identification of support programs and policies, and understanding the challenges and barriers to offering such support services. The quantitative data relating to employees' response to euthanasia indicated that negative reactions were quite common and included feelings of sadness (83.3% [45/54]), crying (68.5% [37/54]), and anger and depression (both, 57.4% [31/54]). Whereas the majority of shelter managers believed that euthanasia was a notable contributor to employee burnout, fewer felt that euthanasia led to turnover. Support programs were considered important for employees that perform animal euthanasia. However, management indicated that a lack of funding was a common obstacle in providing formal group or individual support services, which were the resources that respondents considered would be most beneficial. Open-ended questions were used to collect qualitative data. However, these data were neither analyzed nor reported in the study; rather, they were "used in an illustrative method to support the findings from the quantitative data."[18]

## Discussion

The present systematic review found that there have been a wide range of approaches to the study of occupational stress in caregivers in animal-related fields. Most of the studies included in this review specifically evaluated animal shelter employees,[9,11,16,18,21,22–25] and 6 of 12 studies evaluated small (< 100) sample groups.[11,15,17,18,23,24] In some instances, pertinent methodological and analytic processes, such as ethnographic analysis[11] and thematic analysis,[17] were incompletely described. Demographic information from participants did not include length of time in the profession in the majority of studies, and only 3 studies[16,22,25] indicated the level of financial and physical resources available to them. No single survey item was found to be common among the studies reviewed; rather, a myriad of surveys, scales, and questionnaires were deployed. This variance in assessed variables, along with omission of methods of qualitative analysis, made it difficult to fully compare results. However, the authors of all 12 studies reviewed consistently reported that working with animals (and performing euthanasia) can generate traumatic stress reactions and compromise the well-being of many animal care workers.

The qualitative data provided evidence and insight into coping mechanisms and various strategies used by employees across the many fields of animal care.[11,18,23–25] However, these methods and strategies were anecdotal and further research is needed to yield high-quality evidence that can inform the development of structured and validated programs designed to help employees manage occupational stress associated with animal care. Longitudinal studies that follow individuals over time are necessary, and these likely should incorporate objective physiologic measures of stress symptoms (eg, measurement of blood cortisol concentration), with psychological evaluations.

Diversity in study design and disparity of terminology proved challenging when trying to determine whether occupational stress equated with compassion fatigue in the present systematic review. Our study selection criteria that specifically restricted potential sources to peer-reviewed journal articles proved to be a major limitation in reviewing compassion fatigue in the context of the animal-related professions targeted in this review. To our knowledge, there have been no empirical studies published that specifically focus on compassion fatigue in animal-related professions. A number of additional materials could have been included had we widened our inclusion criteria to include editorials and reviews.

The most intriguing study identified in this review was that of Rohlf and Bennett,[9] which suggested that perpetration-induced traumatic stress is a possibility in workers who perform euthanasia. This was the only study in which participants were enrolled from across multiple occupational settings (including animal shelters, veterinary clinics and biomedical research facilities), for which the results indicated that the mean level of reported stress as measured with the IES-R (Impact of Event Scale—Revised)[37] did not vary across occupations; however, the reasons for euthanasia were different between the fields evaluated. Related to this, a commonly reported contributor to occupational stress is that of societal opinion and the stigma associated with those who engage in "dirty work"[16] (ie, the euthanasia of animals). Individuals who work in tainted occupations become acutely aware of public perception and the stigma associated with what they do.[16] A number of studies[11,16,22] suggest that social supports are an instrumental coping resource in animal-related work. This stigma can create or further compound internal conflict and identity-threatening circumstances and potentially lead to adverse influences on employee well-being.[16] When considering the results of this systematic review and our personal involvement in and contact with the animal care community, we suggest that improved education and awareness of the positive impact animal care workers have in all fields (eg, research, teaching, animal control, veterinary medicine) should be prioritized to combat misconceptions about their personal character. Therefore, we pose the question as to whether the word perpetration as used by Rohlf and Bennett[9] adds to the negative stigma.

Most studies in the present review surmised that for the majority of personnel studied, exposure to continual occupational stress appeared to foster coping strategies. Rogelberg et al[22] reported that whereas employees in veterinary clinics, animal shelters, and research facilities often suffer considerable burnout, this infrequently led to turnover, perhaps because staff in a caregiving role felt that what they were doing (ie, euthanasia) was something beneficial. This may be true for those who are able to maintain emotional resilience; however this would not account for those workers who cannot do so and subsequently resign from animal-related employment. These employees should be identified and accounted for in future research to fully understand the effects of the unique stressors associated with working in veterinary clinics, animal shelters, and research facilities.

The most commonly applied theory in the study of occupational stress and stress management is the demand-perception-response perspective. This perspective states that stress is directly related to both an individual's perception of the demands being made to them and to their perception of their capability to meet those demands.[38] As Clancy and McVicar[39] report, a mismatch of these perceptions results in an individual's stress threshold or stress "hardiness" being exceeded, therefore triggering a stress response. Many of the studies in this review reveal that workplace social support networks are crucial to minimizing job stress, and perhaps it is this that facilitates counteraction of the negative effects and provides positive influence on those who are feeling stressed or burnt out.

Reeve et al[23] suggest the highest degree of employee turnover occurs within the first year of experience with animal euthanasia, defining those who remained in veterinary clinics, animal shelters, and research facilities for over 2 years as being "survivors." Again, there is a lack of data evaluating those who have left these professions, those who didn't "survive the profession"; why did they leave, and what was the turning point?[23]

There is a lack of dedicated experts available worldwide to work with the animal-related professions in this important field of study. Well designed studies to build a body of evidence-based knowledge are essential and should incorporate evaluation of currently employed coping mechanisms as well as investigate strategies that may prevent clinical symptoms of occupational stress or compassion fatigue. Specifically, longitudinal studies of individual facilities and their employees using validated, consistent questionnaires and structured interviews at pivotal intervals to investigate employee longevity (and turnover) are required. This will facilitate the gathering of evidence on long-term effects of occupational stress and euthanasia-related strain in animal care workers and will also allow insight into whether those who remain in these fields as "survivors" as defined by Reeve et al[23] do so because they become desensitized or because they develop successful coping strategies.

It is important to recognize that there are many other animal-related occupations similarly exposed to occupational stressors for which participants would also be susceptible to compassion fatigue. For example, anecdotal evidence gathered through personal communications suggests that personnel caring for captive animals, zoo animals, and native wildlife suffer compassion fatigue. Slaughterhouse employees, while vastly different in their primary occupational purpose, have also been reported to experience adverse mental health issues directly related to their occupation.[40–42] Also of importance is the emerging literature relating to an increased risk of suicide within animal-related professions, in particular the veterinary profession.[43–45] Whereas this area of study is very relevant in the context of our review, the mechanisms underlying a person's propensity to commit suicide are a complete area of study within itself. Therefore, although the absolute importance and implications of this are well recognized, suicide was excluded from the present systematic review and specifically as a keyword in the search strategy because it was deemed outside the scope of this review.

Our study had several limitations. A wide variety of study design types were included, and a number of studies failed to include details of methods of analysis, preventing assessment of study quality. Because only 12 eligible studies were identified, with different types of personnel and settings, the applicability of our findings may be limited. The high incidence of occupational stress and euthanasia-related strain in animal care workers is of great concern to veterinary clinics, animal shelters, and research facilities alike. Although the present review identified a number of studies that have investigated causal factors and coping mechanisms, it was difficult to fully delineate a comprehensive approach to addressing the issue because of the disparity of investigative methods. The profession uses an array of terms, many of which are applied interchangeably. This precipitates confusion and misunderstanding of occupational stress. A more cohesive and standardized approach to future research and implementation of standard terminology may aid the development of effective programs of early intervention and prevention for individuals at risk working in animal-related fields.

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## Appendix

Full electronic search strategy for the ProQuest Social Science database performed as part of a systematic review of the effects of euthanasia and occupational stress in personnel working with animals in animal shelters, veterinary clinics, and research facilities.

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|---|---|
| 01. | euthan* |
| 02. | animals |
| 03. | 1 and 2 |
| 04. | compassion fatigue |
| 05. | occupational stress |
| 06. | 2 and 4 |
| 07. | 2 and 5 |
| 08. | 4 and 5 |