ATTRITION OF VETERINARIANS FROM CLINICAL PRACTICE AND THE INFLUENCE OF MORAL DISTRESS

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Summary

The veterinary profession is recording anecdotal reports of workforce shortage despite surplus expectation. There are two reasons for this concern: a) the time taken to fill available veterinary practice positions is longer, and b) the percentage of intention to leave professional practice is increasing. It is anticipated that these issues arise from veterinarians leaving practice rather than a reduced intake into the profession. Due to the critical role veterinarians have in society, maintaining an adequate workforce is paramount, prompting necessary research to understand the reasons that might be associated with veterinarians leaving clinical practice. Previous research in veterinary attrition has focused on specific groups, such as farm animal veterinarians and emergency clinicians. Only recently has investigating strategies that improve overall retention in veterinarians received attention. Previously reported reasons for attrition include: having emergency duties, poor work-life balance, poor salary, negative work environments and occupational stress. A phenomenon known as moral distress, has been related to career attrition and staff turnover in medical professionals. Moral distress is defined as the psychological and emotional anguish a professional experiences when confronted with a situation where they cannot undergo what they consider to be the morally correct path. This phenomenon has been linked to emotional distress in veterinarians but received limited investigation in veterinary clinical practice. Due to the magnitude of the deleterious effects on staff wellbeing and patient care as well as its relationship with job abandonment in healthcare professionals, an investigation of moral distress and its relationship to attrition from clinical practice was deemed warranted. This dissertation aims to identify why veterinarians leave clinical practice, and establish a possible link between attrition from practice and moral distress.

Firstly, the literature on moral distress in veterinarians was examined for a clear definition. A theoretical model was developed illustrating how exposure to a moral conflict can create a moral deliberation pathway into moral distress. The literature for healthcare professionals exposes moral distress as a possible cause for staff turnover, indicating that a similar contribution could occur in veterinary clinicians. A qualitative exploration of attrition from clinical practice was performed using this theory. A thematic analysis was conducted to understand why former veterinary clinicians had left clinical practice. Two themes emerged: Personal Factors and Work Experiences. It is ascertained that a combination of these two themes influenced veterinarians to leave practice. Several sub-themes within these two broad categories emerged, outlining a detailed list of factors hypothesised to be associated with attrition in veterinarians, including moral and ethical conflict. Following the qualitative study, a survey was disseminated among current and former veterinary clinicians to test the association between factors identified in the qualitative study and attrition from practice. The results link attrition from clinical practice to: working longer hours, having on-call duties, working for lower salaries, working in metropolitan regions, being motivated by social purpose, experiencing lower burnout and lower compassion satisfaction, being dissatisfied with scheduling, and experiencing low personal job satisfaction. The results in relation to burnout and

compassion satisfaction need to be interpreted in the light of the scale limitations when used in a retrospective fashion.

A scale for veterinary clinicians (MDS-V) was created to evaluate the influence of moral distress. The MDS-V has three sub-scales: 1) team relationships that compromise patient and client care, 2) conflicting client interactions, and 3) situations perceived as personal threats. Although moral distress was not significantly associated with attrition, it is associated with psychological ill-health in veterinarians and medical professionals. Therefore, it is important to understand moral distress in order to mitigate its deleterious effects. This study provides a better understanding of this phenomenon in veterinarians.

Aims of the dissertation

1. To explore the pathway of moral distress when exposed to a moral conflict in veterinarians.

2. To understand the reasons for former veterinary clinicians to have left practice.

3. To develop a moral distress scale to measure moral distress in veterinary clinicians.

4. To assess the risk factors associated with attrition from clinical practice (including moral distress) in veterinarians.

Thesis declaration

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

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Name: Alejandra I. Arbe Montoya

Signature:

Date: 13/09/2022

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Manuscripts included

List of publications

1. Arbe Montoya, A.I., Hazel, S., Matthew, S.M. and McArthur, M.L. (2019*), Moral distress in veterinarians.* Veterinary Record, 185:20 631-631. https://doi.org/10.1136/vr.105289

2. Arbe Montoya, A.I., Hazel, S.J., Matthew, S.M. and McArthur, M.L. (2021), *Why do veterinarians leave clinical practice? A qualitative study using thematic analysis.* Veterinary Record, 188:1 49-58. https://doi.org/10.1002/vetr.2

3. Arbe Montoya, A.I., Hazel, S., Hebart, M. and McArthur, M.L. *Risk factors associated with attrition from veterinary clinical practice.* The Australian Veterinary Journal Nov 99:11 495-501. https://doi.org/10.1111/avj.13111

Articles in manuscript form

1. Arbe Montoya, A.I., Matthew, S.M., Jarden, A. and McArthur, M.L. *Moral and Ethical Conflict and Moral Distress in Veterinarians: A Mixed-Methods Approach.* Article not yet submitted, presented in manuscript form

2. Arbe Montoya, A.I., Hazel, S., Jarden, A., and McArthur, M.L. *Attrition from veterinary clinical practice: The contribution of motivations to be a veterinarian, professional quality of life, job satisfaction, work-life balance and moral distress.* Article not yet submitted, presented in manuscript form

Tables, figures, and supplementary materials

Tables

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List of abbreviations

AVA: Australian Veterinary Association

WLB: Work-life balance

MD: Moral distress

CPD: Continuous professional development

GDV: Gastric dilation and volvulus

OR: Odds ratio

PCA: Principal component analysis

CFA: Confirmatory factor analysis

EFA: Exploratory factor analysis

MMD-HP: The Measure of Moral Distress for Healthcare Professionals

MDS-V: Moral Distress Scale for Veterinarians

RVP: Rural Veterinary Practice

GFI: Goodness of fit index

RMSEA: Root mean square error of approximation

TLI: Tucker-Lewis Index

MMSS: McCloskey/Mueller Satisfaction Scale

MJS: Measure of Job Satisfaction

CS: Compassion satisfaction

CF: Compassion fatigue

Chapter 1: Review of the literature

The current state of the veterinary workforce

Veterinarians look after the health of companion and food-production animals. Out of those, veterinary clinicians fulfil key roles in animal agricultural economics, biosecurity, public health, animal welfare, wildlife, and stray animal care[1-8]. Therefore, the sustainability of the veterinary workforce is important. The number of registered veterinarians has seen an increase in Australia[9-13] and overseas[14-16]. For example, the Australian Veterinary Association (AVA) reported 11,418 registered veterinarians in June 2016[17] which increased to 12,769 by June 2018[18] and to 13,993 by December 2021[10]. The Australian Department of Employment, Skills, Small and Family business reported that in 2019 the completion of veterinary courses leading to registration increased by 15% compared to 2017[19]. Other Australian surveys report an increase in the intake numbers of veterinary students and an increase in veterinary graduates[11-13], and universities produce between 500-710 veterinarians yearly through their seven veterinary schools[12,20]. Furthermore, Professionals Australia reports that universities produce graduate numbers that exceed job growth[21]. Similarly, in 2015 the AVA also reported a potential surplus of veterinarians in the workforce[22]. In the US, a veterinary workforce study suggested that the supply of veterinarians would exceed the demand by 12.5%[14]. Other US studies estimated that the capacity to provide veterinary services will exceed the demand for those services projected to 2025 and suggests possible underemployment[23]. Despite this expected surplus, several reports have indicated the perception of a 'shortage' of veterinarians in Australia[19,24] and overseas[25,26]. This labour shortage has culminated in the veterinary profession returning to the shortage occupation list in the UK[27] and being added to the Priority Migration Skilled Occupation List (PMSOL) in Australia[28].

The notion of a veterinary labour shortage is based on two factors: more job opportunities (job advertisements) for veterinary clinicians both in Australia[10,21,24] and overseas[27], and recruitment challenges for veterinary practices[10,18,19,24,27]. More than double the advertised veterinarian positions from 2010 to 2016 indicates an increase in job opportunities[21]. In terms of recruitment, private agencies report that veterinary practices are taking longer to fill advertised jobs[24]. In 2021, 31% of veterinary practices were taking over 12 months to fill their vacancies[10] which is an increase from 24% in 2019[18]. Although appearing to be relatively new for the veterinary profession overall, difficulties attracting and retaining staff has been reported in rural veterinary practice for over a decade[29,30]. The problem with recruitment seems to be associated with more experienced veterinarians and production animal veterinarians[2,27,30,31]. Furthermore, staff turnover (veterinarians leaving a place of employment) can play a role in workforce issues. The latest AVA workforce survey reports that 61% of the new job advertisements for veterinarians were replacing a veterinarian leaving[10]. Therefore, understanding the reasons for veterinarians leaving both their workplace (staff turnover) and the profession altogether (career attrition) is important.

The terminology of employee career attrition and staff turnover is used in the literature interchangeably. In teachers, authors define career attritions as teachers that 'stop teaching' before retirement[32]. Employee turnover, on the other hand, has a broader definition. Employee (staff) turnover involves workers leaving a place of employment or organisation[33-35] but it does not necessarily involve stopping their occupation altogether. In this dissertation we discuss attrition from veterinary clinical practice where the veterinarian has stopped working as a clinician before retirement. However, given the limited literature on career attrition in veterinarians and the possible overlap on the reasons for the two, literature in relation to staff turnover will also be discussed.

Career attrition rates in other professions vary. Professions which are reported to have problematic attrition rates include teachers (attrition rate between 30-50%)[32] and medical nurses (approximate attrition rate 21-39%)[36-38]. However, exact attrition rates are difficult to obtain even in these well-researched industries. For example, Weldon reports an inconsistency with the rates reported for teacher attrition over the years[32]. In medical nurses the concern is regarding how the attrition rate relates to the demand for nurses regardless of the number per se[38]. A similar scenario might occur in veterinary clinical practice, where the concerns regarding attrition rates could be more closely related to the demand for the professional rather than the percentage in itself.

Workforce retention

Managing career attrition is vital for workforce equilibrium. A 1990s survey found that 98% (75% full-time equivalent) of surveyed veterinarians remained working as veterinarians in one capacity or another[39], and it estimated that the average length of a veterinarians' working life in Australia was 20 years[39]. Another longitudinal study reported that 77% of their respondents remained doing veterinary work after 15 years of graduation[40]. A more recent report showed that in 2014 only 4.8% of UK surveyed veterinarians were working outside the veterinary profession and had an intention to leave of only 9.3%[41]. However, the intention to leave the veterinary profession in the UK escalated significantly to 37% in 2018[42]. In Australia, a recent AVA workforce survey describes a 19% intention to leave among their respondents in 2018, a 7% increase from the 13% reported in 2016[17,18]. More recently, a 2021 Australian study reports that 27% of 800 surveyed veterinarians were intending to leave veterinary medicine and out of those intending to leave, 41% were mid-career veterinarians[43]. These numbers refer to stopping or intending to stop veterinary work, not necessarily clinical practice, as data includes veterinarians choosing a non-clinical role within their profession. Attrition and intention to leave veterinary clinical practice has been less explored despite suggestions that veterinarians may not be leaving the profession altogether, just clinical practice[16]. Staff turnover rate (where veterinarians change their place of employment) has received more attention. The Lincoln Institute, in a media release in 2017, reported a staff turnover of 39% and an intention to leave veterinary practice of 37%[24]. Turnover overseas was also similar with 43.7% of veterinarians responding that were likely or highly likely to leave their place of employment within the next two years[27].

Similarly, a New Zealand article reported that 44% of recent graduates leave their first job in practice within the first two years, and a further 16% intend to leave their first job[44]. The workforce issue seems to be associated with low number of veterinarians despite yearly increases in numbers of graduating veterinarians[27]. Despite the essential insight workforce surveys and descriptive studies provide, they narrowly focus on a specific veterinary cohort (e.g. farm animal veterinarians)[31,45], intention to leave the profession entirely[17], or staff turnover[27]. The only report of veterinary clinical attrition is found in a private company's media release, reporting a 37% intention to leave veterinary clinical practice in Australia in 2019[24]. The current attrition rate of clinical veterinarians in Australia is undetermined by peer-reviewed empirical means. Considering the importance of clinical veterinarians for the welfare of companion and production animals, the contribution of clinical veterinarians to the Australian economy, and the notion of staff shortages mostly focused on veterinary clinicians; understanding why veterinarians leave clinical practice is paramount. Although some report that increasing numbers to satisfy employment vacancies could solve recruitment issues, caution is suggested over this measure since not long ago (2015) veterinary jobs were scarce compared to applicants[25]. Others propose the best strategy is to focus on retention of veterinary professionals[46]. Considering that in the latest AVA workforce report (2021), 61% of the advertised jobs were to replace a veterinarian who was leaving[10], focusing on retention seems plausible as an appropriate strategy.

Reasons for attrition in the veterinary profession

To improve retention of veterinarians in the workforce, it is important to understand the reasons for attrition. Reasons for attrition from veterinary clinical practice altogether have not been fully explored. The veterinary literature reports turnover intentions[18,47], reasons for leaving a specific employment field (e.g. emergency[48], rural veterinary practice[30,31,45]), reasons for staff turnover[27], and leaving the profession as a whole (including non-clinical roles)[18,47]. Some of these reasons possibly overlap with attrition from clinical practice: therefore, they are worth understanding.

Veterinary attrition and staff turnover worldwide

Reported reasons for career attrition, staff turnover, and turnover intentions often overlap. In terms of staff turnover, work-life balance (WLB), management and salary were the three main reasons reported by a cohort of UK veterinarians[27]. Similarly, a descriptive study on US emergency veterinarians found that all veterinarians intending to leave the field of small animal emergency objected to the working hours and schedules[48]. This North American study also found they mostly disliked the work environment, found the work stressful, and reported experiencing burnout[48]. Similar responses were found in those veterinarians who had already left small animal emergency practice[48]. New Zealand new graduates' reasons for staff turnover include 'toxic work environments' and lack of support[44]. Overlapping themes can be seen in Australia as reasons for overall career attrition, including personal preferences, desire to work in a non-veterinary role, poor working conditions in practice, and

salary[18,24,40]. However, the specifics of some variables, such as 'personal preferences' or 'toxic work environment', were not clearly conceptualised in those descriptive studies making homogenous interpretation of the variables difficult. More information on reasons for attrition and staff turnover was acquired from research in veterinarians working in rural veterinary practice.

Rural and farm animal veterinarians

The majority of research has focused on reasons for veterinary attrition from rural or farm (also described as food-producing) animal practice[7,30,31,45,49-52] as the group concerned with shortages[25,29,50-53]. The most frequently reported reasons for leaving rural or farm animal practice were dissatisfaction with working hours (particularly with after-hours duties) and perception of low financial return[29-31]. Other reasons included lack of opportunities for career diversification[30], practice atmosphere[31], family concerns[31], and having no support from an experienced colleague[45]. An Australian report considered links between local shortages in production animal veterinarians and rising costs in rural communities, long hours, reluctance of producers to utilise veterinary services, and lack of social opportunities for themselves and schooling options for their families[7]. Furthermore, although there are some protective elements such as the type of work and enjoying the 'rural lifestyle'[30,49], there were concerns regarding hours of work and fair remuneration with Australian rural veterinarians[30]. It is important to acknowledge that studies used in rural or food-producing animals do not represent the overall population of veterinarians.

Overall summary of reasons across literature

Overall, the veterinary literature relating to career attrition and staff turnover do share some commonalities. Salary, for example, is repeatedly mentioned as a source of concern[52,54]. Poor remuneration was a significant reason for both attrition and staff turnover in Australian veterinarians in rural veterinary practice[30], non-rural Australian regions,[39,40] and overseas[27,31,49]. Some industrial reports mention stagnant wages for veterinarians, who are reported to earn 10% less than the average for all professions[21]. Perception of poor remuneration could contribute to poor morale[21] and, consequently, job dissatisfaction. Veterinarians have reported perceptions of renumeration being low since the 1990s[39], and a deterrent for future shelter veterinarians in the US[55]. Another commonality is dissatisfaction with working hours, high workload and perception of poor work-life balance (WLB)[27,30,31,41-43,47,54]. Average working hours in New Zealand[54], Australia[19] and the UK[41] are 40 hours per week or more which is higher than the recommended full-time equivalent of 38 hours per week. It has been suggested that more flexible working hours and schedules, and good WLB are important for staff retention and career longevity[42,48,56]. Finally, practice atmosphere, negative (referred to as toxic) workplaces, isolation and lack of support were found as reasons for staff turnover in veterinarians[31,44,45]. The work environment looks importantly associated with negative work experiences in the first year of practice, which could shape the future career of veterinary graduates[57]. Practice atmosphere and culture has been associated with the relationships with management and other colleagues, which was also associated with turnover intentions in UK veterinarians[27].

Leadership played a critical role as the availability of role models was the strongest predictor for retention in a recent veterinary survey[42]. Furthermore, mentorship is stated as an important strategy to retain veterinarians in rural veterinary practice[50], with collegiality being an important factor as well[42]. Despite extensive research around veterinary attrition from areas of veterinary practice, as yet, the contribution of moral distress to attrition is unresearched in the veterinary field. In other professions, moral distress[58,59] was included in the association with reduced staff retention, together with similar factors, such as salary[60,61], negative work environments[59], hours of work[61], overwork[61], and lack of support[59,61-63].

Occupational stress, job dissatisfaction, and moral distress

Other pertinent factors linked to staff turnover and career attrition in other professionals require exploration in veterinarians, including occupational stress[64], job dissatisfaction[65-67] and moral distress[58,59,68].

Occupational stress

Occupational stress (when job demands exceed the employee's coping resources[69]) is not uncommon in veterinary practice[41,42,70-74]. A 2014 report from the UK state almost 90% of respondents found veterinary work stressful[41], and 21% of another cohort say they could not cope with the stress, with 48% experiencing burnout[42]. Furthermore, veterinarians experience more psychological stress than the general population in the US[75]. In a 2005 Australian survey, 75% of female veterinarians and 57% of male veterinarians reported experiencing significant levels of work-related stress[76] associated with long hours of work, working after-hours, low pay and appreciation, lack of familiarity with medical conditions and procedures, and lack of experience with some animal species[76]. In a Queensland study, most veterinarians (over 70%) considered their veterinary work caused a significant amount of stress both five years and ten years after graduation[76,77]. One of the studies reported that veterinarians with less responsibility for animals were less likely to consider their veterinary career stressful than those with more animal responsibilities[76].

Job dissatisfaction

Job satisfaction indicates a positive relationship between an employee and their job[78,79]. When this relationship is negative (job dissatisfaction), attrition (and staff turnover) tend to increase[67,78,79]. Job dissatisfaction can also be associated with reduced work engagement[80,81], burnout[79,81], and (in healthcare professionals) quality of patient care[78,79]. In non-veterinary professionals, the relationship between job dissatisfaction and attrition is significant[67,78,82], and job satisfaction in recently graduated medical nurses has been associated with increased retention[82]. Although this factor holds importance, its conceptualisation has been inconsistent throughout the veterinary literature, and requires further empirical research on possible links with attrition in the veterinary profession. Indications of a relationship between job satisfaction and attrition in veterinarians exist. For example,

some North American production animal veterinarians who reported intention to leave farm animal practice also reported low satisfaction with their occupation and less enthusiasm and pride in their job as farm animal practitioners than those with no intention to leave farm animal practice[83]. Additionally, less joy derived from the chosen field of work was cited as a reason for intention to leave in emergency veterinarians[48]. Sources of job dissatisfaction in veterinary practice have been: dealing with clients, low work-life balance, and the physical and emotional impacts of the job[27]. Finally, although moral distress (also discussed in relation to ethical dilemmas) has been associated with occupational stress in veterinarians[84-87] no studies have explored its association with career attrition in veterinarians.

Moral distress

An area that has been linked to attrition in the healthcare profession[58,59,68] but under-researched in the veterinary profession is moral distress. In medical nursing research, moral distress is defined as the psychological and emotional anguish a professional experiences when confronted with a situation where they cannot take what they consider to be the morally correct path[88,89]. Moral distress in healthcare professionals has deleterious effects such as burnout, compromised patient care, compromised professional integrity, decreased job satisfaction, and contributes to increased staff turnover[58,59,90-95]. In veterinarians, moral distress has been reported[85,86], but research is limited compared to medical professionals. Furthermore, the influence of moral distress on veterinary attrition from practice is not known. Due to the magnitude of deleterious effects moral distress can have in the professional experiencing it as well as in patient care and its relationship with staff turnover in healthcare; it was decided to explore the contribution of moral distress to veterinary clinical attrition. The second chapter of this thesis reviews the literature concerning moral distress in veterinarians.

Limitations of the current veterinary literature and gaps in knowledge

Authors reporting on attrition in teachers and healthcare professionals conclude that the reasons for this problem are multifactorial[59,62,63,96], and often act in combination[63]. The problem is broader than addressing job deterrents such as low salary[96]. Still, these concepts are under-researched in veterinary sciences. A deeper understanding of the multifactorial reasons for veterinary clinical attrition, how those factors interact with each other, and the contribution of moral distress is needed. The previously cited studies in the veterinary literature have used qualitative analysis of open survey responses and descriptive statistical analysis to understand staff turnover, career attrition and attrition from specific areas of veterinary practice[27,31,40,45,48,49,52]. Furthermore, previous qualitative studies are limited to free-text analysis without in-depth interviews[49], missing a deep exploration and contextualisation of the reasons for attrition in former veterinarians. Quantitative studies have performed descriptive data analysis without statistical modelling[27,31,48,52,97] to understand the research question (why veterinarians leave clinical practice) in light of confounders. One study had statistical modelling to assess interactions between variables, but the outcome variable was retention in farm animal practice[45]. Another study

was on staff turnover after one year in practice of newly graduated veterinarians[54]. Neither study evaluated attrition from veterinary clinical practice in general. Statistical modelling to assess the reasons for attrition from practice using validated scales is yet to be done. Statistical modelling would allow the assessment of multiple variables in light of each other (all else being equal) rather than as individual constructs[98] which is important to reduce the effect of confounders. As previously mentioned, these studies have focused on an area of clinical employment, intention to leave, staff turnover, and leaving the veterinary profession altogether, but not on leaving clinical practice. Furthermore, although moral distress is associated with staff turnover in medical professionals, and ethical challenges have been associated with work stress in veterinarians, veterinarians' moral distress as a possible reason for attrition has not been empirically studied.

The following dissertation starts with a review of the literature concerning moral distress in veterinarians (chapter 2), where the concepts of moral conflict, moral stress and moral distress are defined, and a moral deliberation model is theorised. We continue with an in-depth qualitative analysis of reasons for attrition using semi-structured interviews and qualitative methodologies unveiling why 26 former veterinary clinicians left practice (chapter 3). During these interviews, the concept of moral distress in this cohort of veterinary graduates was also explored which is reported in chapter 5 where moral distress is evaluated in more depth. After the initial interviews, a survey was developed from the qualitative results to assess hypothesised reasons for veterinary clinical attrition in a larger cohort of veterinary clinicians. This survey also included a section on moral distress which was used to develop a moral distress scale in chapter 5. The survey results are presented in three studies. The first one (chapter 4) evaluates demographic factors and working conditions, such as hours of work and salary in relation to attrition from veterinary clinical practice. The second one (chapter 5) uses the results of the moral distress section of the survey to develop a moral distress measure for veterinary clinicians. In this chapter an analysis of free-text answers on additional sources of moral conflict is also conducted. Finally, in chapter 6, potential relationships between variables, such as professional quality of life, job satisfaction and moral distress and attrition from veterinary clinical practice are reported.

Thesis methodology and outline of methods

A mixed-methods approach

To get a better understanding of the reasons that might be associated with veterinarians leaving clinical practice and the influence of moral distress, a mixed-methods approach was chosen. By choosing both qualitative and quantitative methods of investigation, a broader exploration of the human behaviour and context around reasons for attrition can be reached[99,100]. The results of the initial qualitative exploration can provide more depth in the understanding of a phenomenon or human behaviour which can then be measured in a quantitative method in a larger population. Utilising both qualitative and quantitative methods also enhance triangulation since the

research question is explored by two different methodologies[101]. Qualitative information is based in empirical observation without being controlled by quantitative parameters which has the advantage of capturing information that may be missed by quantitative control[99]. When information is then measured by quantitative mechanisms, our confidence that the results are a representation of the measured phenomenon is enhanced, leading to an overall better understanding of the data[99]. As Todd[99] explains, qualitative research focuses on 'understanding' their subjects and quantitative is aimed to 'measure' an action or event[99]. Using both methods allow a synergistic approach to the research question where we can both understand the reasons behind veterinarians leaving practice and also measure the possible contribution to attrition of those variables. The quantitative approach can lead to a numerical explanation of hypothesis emerging from the qualitative exploration and inversely, the qualitative approach can provide the theoretical explanation for results seen in the quantitative analysis[99]. Initially, the focus is on individuals and their experiences to be followed with the measurement of such experiences in a larger cohort.

Qualitative methodology

An initial qualitative approach allows the researcher to explore pathways that might be opened by interview questions permitting the researcher to understand a complex process in more detail than through quantitative methods[99,102]. Through this exploratory step, we unveil the phenomena of veterinary clinical attrition and moral distress in former veterinary clinicians with little predisposed ideas or previously developed concepts[103]. In chapter 3 through in-depth interviews, we are able to understand the circumstances surrounding the experiences of veterinarians in relation to their decision to leave practice. This understanding is achieved by the interviewer being able to acquire more information by asking follow up questions in specific topics as well as allowing the participants to discuss the research topic in their own terms and in as much detail as they are willing to share[102-104]. Qualitative investigation also occurs in chapter 5 where the experiences of moral distress by former veterinary clinicians is described and by analysing free-text survey answers in relation to moral and ethical conflict in a cohort of current and former veterinary clinicians. Inclusion of a free-text response section allows the respondents to expand on potential aspects of moral conflict beyond the structured survey questions which otherwise would have been missed.

The philosophical assumption underling this research is more closely related to an Epistemological perspective as described by Creswell[102] than other described philosophical assumptions (Ontological, Axiological, and Methodological). Although the researcher does not conduct field work, the main researcher is a veterinarian in clinical practice placing the researcher as an 'insider'[102]. Furthermore, the researcher relies on quotes and experiences of the participants as the evidence to be analysed[102]. In terms of interpretative frameworks; postpositivism[104] underlies the work in this dissertation. The enquiry follows related logical steps, uses different types of data analysis, is based on previously developed theories and hypotheses and, although we do not

attempt to interpret the results as cause-effect, the interpretation of the results in relation to the research question is cause-effect orientated[102]. In a postpositivist paradigm, a probable truth and critical objectivity can be achieved[105,106]. However, there is a risk of compromising on diversity of perspectives and requiring additional triangulation techniques to achieve the desired accuracy[106]. Accuracy and rigour were ensured by following the guidelines of Braun and Clarke[100,107], Liamputtong[104], Creswell[102], and Tashakkori and Teddlie[101]. The principal researcher who was a veterinary clinician before the commencement of the study, aimed for a level of prolonged engagement, and thus being immersed in the 'culture'[101,102] of veterinary clinical practice. This information was disclosed to the participants (through the participant information forms in both the interviews and surveys) in the hope to encourage the participants to 'open up' with more ease reducing the chances of withholding information[104]. Triangulation was obtained by having authors of different fields revising the data and the manuscripts, acquiring data from different locations, fields, and areas of veterinary practice, and ultimately using quantitative methods to further investigate our qualitative results[101]. Reflexivity was achieved as the principal researcher underwent a process of critically reflecting on their own biases as a veterinary clinician who has experienced moral distress. By creating such self-awareness, the risk of unconsciously imposing their perspective on participants was reduced[104]. However, it is acknowledged that the beliefs and personal history of the principal researcher can influence how this thesis is written[104]. Other methods to ensure rigour included: reaching saturation in the sampling of interview participants, member checking where three randomly selected interviewees confirmed that the transcription of their interviews represented their observations[101], inter-coder agreement where over 90% agreement was achieved in both the coding of the interviews and free-text answers[108], and the peer review process of both publications and thesis examination ensuring independent audit of the qualitative data[101].

Description of quantitative methods and treatment of missing data

Chapter 4,5 and 6 arise from the answers to a survey which was developed based on the findings of chapter 3 and the qualitative portion of chapter 5. The survey was distributed to Australian veterinary graduates and included demographic information as well as scales to measure factors hypothesised to be related to veterinary clinical attrition. Additional questions on moral distress were added in order to perform a factor analysis and develop a scale to measure moral distress in veterinary clinicians. The survey asks both current and former veterinary clinicians to rate some of their experiences in clinical practice. The survey uses the veterinary career motivations questionnaire, Stamm's Professional Quality of Life measure (ProQOL)[109], sub-scales of job satisfaction measures, a work-life balance measure for general workers, and the moral distress scale developed in chapter 5. It is important to acknowledge that the ProQOL is intended to measure professional quality of life at a given point in time (within 30 days). We are using the measure to get possible indications of professional quality of life in veterinarians that have left clinical practice potentially a long time ago. The measure was not designed to be used in this manner[109]. However, considering that there are few scales that can measure

psychological phenomena in such a retrospective way, we decided to use this measure despite the limitations and eliminate the 30-day timeframe from the instructions given to respondents. It is important to understand that the results that arise from this final chapter are interpreted in the light of the limitations of the measure and are used only as potential indications for future research.

There were 962 responses downloaded on February 16th 2020. Out of which 42 were either mock responses (the candidate and test subjects had answered in order to check the quality of the survey) or had not answered the consent form and thus were blank. This left a total of 920 valid responses. Out of 920, 39 were excluded since they did not answer the outcome variable (whether they had left clinical practice) or were over 75% incomplete leaving a total of 881 responses for the initial analysis. The analysis of the demographic variables was separated from the psychometrics analysis since 108 participants did not answer the psychometric measures. It is possible that respondents were less likely to respond to questions that might have been perceived as intimate or intrusive leading to response bias[110,112]. In order to prevent the loss of those 108 demographic responses, it was decided to analyse the demographic responses (chapter 4) and the psychometric responses (chapter 6) separately. From the 881 responses, 84 former veterinary clinicians (9% of total) were excluded from both the demographic and psychometrics analysis due to being retired as the research question was to investigate reasons associated with attrition from veterinary clinical practice before retirement. The analysis of moral distress did include the 84 responses of retired veterinarians.

It was an ethics committee requirement to allow respondents to skip questions. Therefore, some missing data required management. Missing data was a concern for analysing the schedules sub-scale from the job satisfaction measure. One item of the sub-scale relates to satisfaction with parental leave. Since participants were allowed to skip questions, there was an important number of participants that skipped this question (n=103). Reviewing this pattern of missingness, we suspected that the non-respondents might have been non-parents and therefore this question was not applicable to them. To avoid selection bias against the respondents that skipped this question, it was decided to impute the response of that variable as ‘3’ (neither agree nor disagree) and use those responses in the regression model. Imputation of missing data can lead to reduced variability in the dataset and could lead to an inaccurate estimation of the missing values[110]. Imputation of these variables was deemed necessary to avoid the selection bias mentioned above and to retain a sizable sample to minimise loss of statistical power[110]. Imputation bias was minimised by theoretically explaining the pattern of missingness[110]. Listwise exclusion of missing data where only complete answers are included in the statistical analysis was used for both logistic regression models after imputation of ‘3’ to the job satisfaction measure. Using a listwise exclusion for the model resulted in only having 629 cases for the descriptive analysis and 600 cases for the analysis of the psychometric variables. Listwise deletion reduces the degrees of statistical power[111]. However, using listwise exclusion was still deemed appropriate in our studies since there was a proportionate

number of cases in both outcome groups (staying and leaving clinical practice), the sample was still large enough to yield appropriate results, and both regression models met the required assumptions.

Out of the 920 valid responses, 643 (70%) answered the moral distress survey. This might be because the moral distress survey was at the very end of a relatively long survey and some participants reported difficulties answering it on a mobile device or because the nature of the questions could have been perceived as intimate or intrusive[112]. The exploratory and confirmatory factor analysis for the moral distress component was completed on the 643 answers. Where respondents selected 'not applicable' was coded as '0'. The confirmatory factor analysis used maximum likelihood as the estimation method. There was also a qualitative analysis of free-text answers responding to the following question: *Thinking back to your time as a veterinary clinician, were there any other elements that you considered to cause moral or ethical conflict? (please specify).* This qualitative analysis was done on 261 codable responses. Table 1 shows a breakdown of the data numbers used for each analysis.

Table 1: Breakdown of data used for the different analyses.

	Total number of responses (%)	**Outcome variable (%)**	
		Staying in clinical practice	**Leaving clinical practice**
Total downloaded answers	n = 962		
Total valid responses	n = 920 (100%)		
Total responses for demographic analysis	n = 881 (96% of 920)	581 (66%)	216 (25%)
Demographics regression model	n = 629 (71% of 881)	459 (73%)	170 (27%)
Total responses for the psychometrics analysis	n = 773 (84% of 920)	568 (74%)	205 (27%)
Psychological variables regression model	n = 600 (78% of 773)	439 (73%)	161 (27%)
Total responses of moral distress scale	n = 643 (70% of 920)	416 (65%)	227 (35%)
Total codable responses for free text analysis	n = 261 (28% of 920)	172 (66%)	91 (34%)

Ethics

This project received ethics approval from the University of Adelaide Ethics Committee (H-2017-229). Ethical considerations included acquiring informed consent from participants, ensuring that the participants were able to stop the interviews and surveys at any given time, provision of mental health crisis phone numbers, safeguarding confidentiality and anonymity, and ability to skip questions or answer 'not applicable' on the surveys. Every participant (for both the interviews and surveys) was presented with an information sheet describing the nature of their participation in the study. Participant recruitment for the interviews included word of mouth contact in a passive form where the researcher was not contacting possible participants but people contacted the researchers themselves. To ensure mental health safety for the participants, the interviewer had a valid mental health first aid certification and contact details for mental health crisis were provided to the participants. The lead researcher received guidance from a clinical psychologist (principal supervisor) to conduct the interviews in psychologically safe way for the interviewer as well. Confidentiality was ensured by not disclosing details about the participants in the manuscripts that might compromise their anonymity and by maintaining their documentation in a locked cabinet. In relation to the surveys, they needed to be of appropriate length (recommended not longer than 30 minutes), the surveys needed to have the option for a 'not applicable' answer and ability to skip questions if desired. State based mental health hotlines were also provided at the end of the survey.

Summary

In the following pages we will explore reasons for attrition from veterinary clinical practice and the influence of moral distress. Initially, in chapter 2, the concept of moral distress in veterinarians will be defined in the light of the literature. In chapter 3, the reasons for clinical attrition in a group of former veterinary clinicians will be described and a number of themes will emerge. During these interviews the topic of moral distress will be discussed with the participants. The results from chapter 3 will inspire a survey asking the prevalence of certain factors hypothesised to be related to attrition in a larger group of veterinary graduates. To avoid excluding responses that only addressed demographic factors, we will divide the analysis for reasons for attrition in two studies. In chapter 4 we focus on demographic and work-related factors. To understand the influence of moral distress on attrition from clinical practice, we needed to further understand moral distress in veterinary clinicians. In chapter 5 we will analyse both the process of moral distress development in the former veterinary clinicians and develop a moral distress scale from an adaptation of a validated scale for healthcare professionals. In chapter 6 we analyse the potential relationships indicated between selected psychometric variables (including moral distress) and attrition from veterinary clinical practice.

Ideally, we would have liked to evaluate every sub-theme that arose from the analysis in chapter 3. However, it would have been logistically not possible due to the length of the survey and finding adequate existing measures. Furthermore, if no existing measure was found for any given theme, we would have liked to create our own (as we did with moral distress) but time restrictions for the dissertation did not allow for this process. Finally, we would have liked to have two different surveys, one exclusively for moral distress and the development of the measure and a different population to test the measure and the other variables. Due to time constraints that was not possible.

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Chapter 2: Moral distress in veterinarians

Summary

As discussed in the introduction of this thesis, moral distress is a phenomenon that leads to emotional anguish and occupational stress in those professionals that experience it. Moral distress has been associated with attrition in healthcare professionals and has also been associated with reduced patient care. Moral distress has been widely studied in other professions but lacks deep investigation in veterinary clinical practice. To better understand moral distress in veterinarians a review of the current literature was conducted. The following chapter was published in The Veterinary Record in 2019.

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Moral Distress in veterinarians

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Abstract

Moral distress is a psychological state of anguish that has been widely studied in healthcare professionals. Experiencing moral distress can lead to problems including avoidance of patients and increased staff turnover. Moral distress in veterinarians has not yet been explored to the extent seen in the human medical field, and there is limited data regarding moral distress in veterinarians. However, it is expected to be prevalent in these professionals. So far, it has been reported that veterinarians commonly experience moral conflict, ethical challenges and ethical dilemmas during their career. These conflicts in association with other modifying factors such as personality traits can lead to the experience of moral distress. In a profession with known levels of occupational stress and reported mental health problems, exploring the area of moral distress and its effects on the professional wellbeing of veterinarians is important. Further studies such as developing a moral distress scale to measure this issue are needed in order to evaluate the incidence of this problem in veterinary professionals. Furthermore, assessing a possible relationship between moral distress, mental illness and attrition in veterinarians would be useful in developing intervention strategies to minimise the experience of moral distress and its associated negative consequences in veterinarians.

Introduction

The veterinary profession is at the centre of the ethical treatment of animals. Since veterinarians participate in almost every aspect of animal use they are considered to be a key influence on how animals are treated in society[1]. However, veterinarians also have a duty to serve their human clients and to meet the expectations of their communities[2]. These duties can sometimes oppose and veterinarians will find themselves in situations of conflict of interest. Such conflicts may then become an additional source of stress for veterinary professionals[2,3].

Conflicts of interest for veterinarians include ethical dilemmas and moral conflicts[1-6]. An ethical dilemma occurs when a professional is unsure of the best path of action with no obvious way to prioritize one action over another[3,6,7]. A moral conflict occurs when the professional is aware of their own morally correct path but is unable to follow it satisfactorily due to internal or external constraints[8]. Throughout the literature one can find that authors use the concepts of 'ethical issue'[1] 'ethical conflict'[7,9], 'ethical dilemma'[6], 'ethical challenge'[2,5], 'moral issue'[10,11] 'moral stressor'[12], 'moral problem'[2,13,14] 'moral conflict'[8] and 'moral challenge'[12] interchangeably.

For simplicity, this review will use the terminology of: 'moral conflict' as a situation that conflicts with the professional's personal morals[8,10], 'moral stress' as the stress elicited by experiencing a morally conflicting situation[15-17] and 'moral distress' as the psychological disequilibrium experienced from being constrained from following the perceived correct moral path[10,12,18,19]. In accordance with Morley *et al*[20], moral distress occurs when there is 1- the experience of a moral event, 2- the experience of 'psychological distress' and 3- a direct causal relation between 1 and 2 together. These requisites are necessary and sufficient conditions for moral distress to occur.

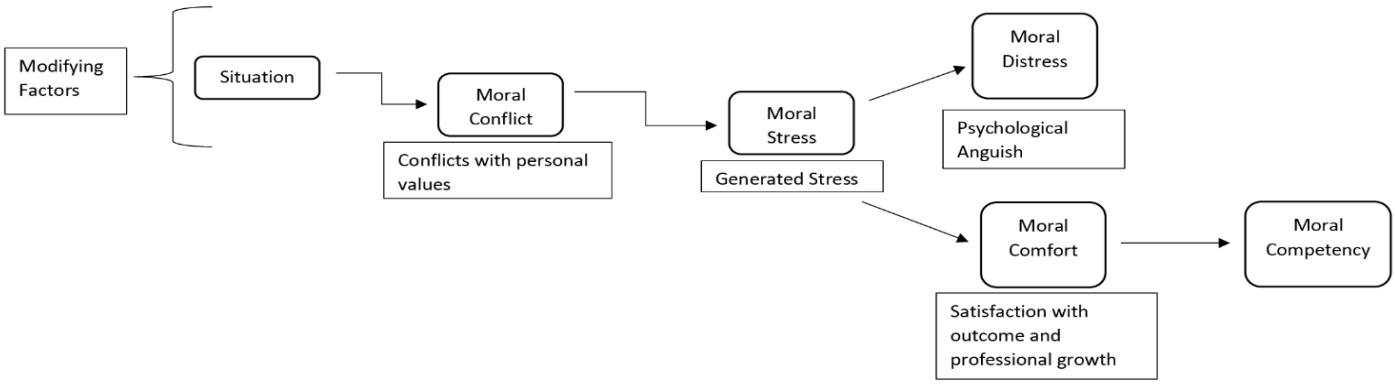
Morally conflicting situations lead to the experience of moral stress[16,21], but not necessarily moral distress. For example, as described by Rollin, euthanasia of healthy animals is an important moral stressor in veterinarians[16,21]; however, veterinarians will deliberate on this moral conflict differently[2,5,12] and objectionable euthanasia will not be a source of psychological distress in many veterinarians[22]. The development of moral distress from a moral conflict is influenced by both internal and external factors, including personality and other occupational stressors[12]. These factors not only impact the perception of a situation as a moral conflict but also have an effect in each step of the deliberation process the professional undergoes from the exposure to a moral conflict to a final resolution of the situation.

This reasoning process has been outlined in veterinarians[2,5] and described as the *moral deliberation process* in medical professionals[23]. The moral deliberation process in healthcare professionals is commonly influenced by factors including: personality, gender, level of ethical reasoning (how nurses reason when faced with an ethical dilemma and implement that decision)[24] and professional knowledge[25]. In veterinarians the professional's

personal experience, emotions and experiences of others[5], as well as personal beliefs regarding animal value and organisational obstacles[2], will guide the path of how veterinarians make ethical decisions when faced with moral conflict[2,5]. Figure 1 is designed to represent this process based on a pattern observed by the authors in the systematic review of the literature by Mares, and incorporates the models developed by Corley, Epstein and Wilkinson[13,14,23,26] for healthcare professionals. It outlines the moral deliberation process and the role of modifying factors within this, using examples drawn from the veterinary and medical nursing professions. For example, trait perfectionism has been associated with experiencing higher levels of psychological distress in veterinarians when exposed to a moral conflict[12] and moral competency has been associated with experiencing lower levels of moral distress[14].

Figure 1: The moral deliberation process. The figure shows the step by step process professionals experience when a morally conflicting situation is encountered.

Figure 1: The moral deliberation process and outcomes



Moral distress in healthcare professionals

Moral distress was initially defined by Jameton and Wilkinson when discussing the ethics of nursing[10,18]. Since then moral distress in healthcare has been discussed and redefined several times[27,28]. It is often described as the psychological disequilibrium a professional encounters when internal and/or external constraints prevent them from following what they perceive to be the correct moral path[10,13,14,18]. The definition we prefer by Morley *et al*[20].requires there to be a moral event, 'psychological distress', and a link between the two, without the requirement for any constraints. It can be theorized that moral conflict and moral distress stem from a conflict within one's professional role, based on ethical responsibilities. A moral distress scale (MDS) for nurses has been created and validated[29], then revised and validated for other healthcare professionals (MDS-R)[30], to investigate this. In the veterinary industry the term (described as moral stress) was introduced by Rollin a very particular type of stress that occurred when animal care workers had to euthanise animals for objectionable reasons[16]. This definition was limited to only one situation that could elicit moral stress in animal care workers and currently several other situations have been reported to elicit a similar type of stress in veterinarians[3,6,9]. However, as of yet there is no validated moral distress scale developed for veterinary professionals in order to measure this issue.

Moral distress has been explained as a violation of one's professional integrity and obligations[13]. This can then develop into an underlying perception of infringement of a person's moral integrity and feelings of belittlement, impotence and isolation. Such emotional burden can devastate one's moral sensitivity where the professional may stop recognizing or engaging in morally challenging situations[31]. It has been established in the medical profession that unrecognized moral distress has a negative correlation with wellbeing and is associated with low job satisfaction as well as career attrition and increased staff turnover[21,23,24,26-28]. In veterinarians, there is little work done on the relationship between moral distress and attrition. Other reported consequences of moral distress include conscientious objection, development of anxiety, anger, frustration and burnout[27,31], avoidance of patients[10,14] which can compromise the patient care the professional is able to provide. While detailed research on this is yet to be conducted in the veterinary profession, the potential implications are concerning.

Career attrition and increased staff turnover has been routinely reported in the healthcare professions as a deleterious effect of moral distress. Nurses and other healthcare professionals experiencing high levels of moral distress are more likely to leave their current position or the profession altogether[10,14,27,29,30,32-34]. For example, a study in 2007 that surveyed nurses and physicians regarding their perspectives on the care of dying patients, found that 45% (n=90) of registered nurses from a particular institution had left or were considering leaving their position due to moral distress[34]. Hamric *et al*. found a high proportion of both physicians and nurses had left or were considering leaving their occupation due to moral distress (16% (n= 36) and 30% respectively (n=163))[30].

Little research has occurred into relationships between moral distress and career attrition in veterinarians. Given concerns about the implications of moral distress[9] and the limited information regarding attrition in the veterinary profession, investigating linkages between these could prove fruitful.

The concepts of moral competency and moral comfort have been proposed in medical nurses as potential positive alternatives to moral distress[14]. Moral competency is the ability to understand morally conflicting situations and use good judgement, intention and behaviour when responding to these[14]. This competency develops through the professional growth and learning that results from experiencing and compassionately and effectively dealing with moral conflict. Moral competency has been reported in medical nurses to increase the likelihood of achieving moral comfort, which is the feeling of satisfaction that accompanies successfully resolving a moral conflict[14]. Moral competency may also modify the outcome of moral conflict for individuals with high moral integrity, which is adherence to moral values affecting the sense of dignity and self-respect[14]. Corley stipulates that, for example, nurses with high moral integrity but lack of moral competency are those that are at higher risk of developing moral distress[14]. Hamric proposes additional measures to alleviate moral distress in medical professionals[19]. These include recognizing moral distress when it occurs, speaking up and insisting on dialog with the involved parties, understanding the root of the moral conflict and whenever possible addressing it[19]. The notion of moral (or ethical) reasoning has been highly regarded in healthcare professionals [24] and studied in veterinarians[2,5,35] and veterinary students[36-38]. Although the relationship between ethical reasoning and moral distress is yet to be established some authors suggest that developing ethical (moral) reasoning to be important to avoid developing moral distress in these professionals[39].

Moral distress has also been discussed in other professionals. This includes: police officers[40], the military[41,42] and veterinarians. In veterinarians, authors have established the presence of moral conflicts and moral distress as well as a connection between moral stress and occupational stress[2,6,9,12,21]. However, a deep understanding of the problem in this field is lacking. In a profession, such as veterinary medicine, where high levels of mental health problems[43-46], occupational stress[44,47,48] and burnout[44,49,50] have been identified, it becomes imperative to investigate factors such as moral distress that may be contributing to this.

Moral conflicts in veterinary professionals

Similar to other healthcare professionals, veterinarians can find themselves in situations involving conflicts of interest. For example, there are times where providing best patient care will conflict with what is best for the organisation, the patient's owners or other patients[2,3,7,9]. A similar scenario has been noted in medical nursing[14,18]. However, some conflicts are unique to the veterinary profession and not experienced by other professional bodies.

Veterinarians are required to balance competing human and animal interests[1]. For example, veterinarians are called to respect their clients' autonomy and at the same time uphold the welfare of their animal patients[2]. They carry the obligation to fulfil their responsibilities towards their clients, their colleagues, the profession, their animal patients and the public[2]. At the same time, they deal with the moral status and value of animals as a continuously contested moral claim[2,3,7]. As pointed out by Tannenbaum: '*Veterinarians are confronted daily by the central ethical fact underlying all human-animal interaction: animals as well as humans often have legitimate interest and moral claims that flow from these interests'* (Pg. 1)[1]. Therefore, veterinarians as a profession are called to serve both the interests of animals and people[1]. On one hand they are expected to promote and value the welfare of animals and should not condone nor take part in animal suffering[2,51]. Public expectations of veterinary duties align with this perception of veterinarians being the voice for the wellbeing of animals. For example, Morgan and McDonald argue that if and when veterinarians engage in harmful practices to animals (even at a client's request) they may advance the deterioration of public trust in the veterinary profession[3]. On the other hand, however, veterinarians are expected to fulfil their client's and employer's needs which, in some instances, may oppose the needs of the animals under their care[1,3]. It is concluded that society requires a profession that sometimes serves the interests of animals, sometimes the interests of humans and sometimes the interests of both[3]. These differing requirements often produce situations of moral conflict which can then lead to moral distress.

The complexity of veterinarians' obligations contributes to different perceptions of the role of the veterinarian even amongst veterinary staff and colleagues. There is little consensus on whether veterinarians are to be advocates of their patients, serve their client's best interest or merely act as informants to provide the clients with the necessary information[3]. For example, an in-depth qualitative study reviewing the responses of veterinarians to ethical dilemmas concludes that veterinarians disagree on the fundamental importance of life and death in animals. This study uses the example of food veterinarians believing that the animal's life is there for the benefit of the producer, which contrasts with the views of small animal veterinarians who have a wider breadth of opinion regarding the value of an animal's life[2]. This diversity of opinion amongst veterinary professionals regarding the value of animals as the focus of veterinary care is unique to the veterinary profession and generates many uniquely conflicting situations. Understanding the moral conflicts experienced by veterinarians is the initial step to comprehending moral distress in veterinary medicine.

The presence and impact of moral conflicts in the veterinary profession were first discussed nearly thirty years ago. Rollin presented the concept of moral stress in veterinary professionals such as shelter workers, laboratory technicians and veterinarians involved in the culling of animals[16,21]. Moral stress was described as a very specific occupational stressor that cannot be alleviated by regular stress-relief management techniques[21]. Such commentaries have initiated dialogue regarding moral stress in veterinarians and influenced research into moral stress in shelter workers. Recently, a study surveying 889 North American veterinarians established the

presence of moral conflict and moral stress in veterinarians. The authors hypothesised veterinarians may not recognize moral distress but describe a situation as 'sad' or 'upsetting' and that many veterinarians consider moral conflicts as just part of veterinary practice[9]. However, there is a paucity of research examining the psychological effects of moral stress in veterinary clinicians. Currently, experts discuss the serious, insidious and harmful effects of moral stress in veterinarians [9,52] and consider the exposure to ethical dilemmas (as moral conflicts) to be an important source of stress and distress [6,9] as well as the biggest contributor to compassion fatigue [17]. However, empirical data in this area are limited.

Moral conflicts as part of ethical dilemmas are experienced frequently by veterinarians. For example, a UK study reports that 57% of surveyed participants experienced one to two ethical dilemmas per week and 32% experienced up to five ethical dilemmas per week. Only 5% of the participants reported experiencing no ethical dilemmas [6]. Although this paper provides evidence of what the authors perceive as morally stressful situations (described as ethical dilemmas) in veterinarians it only surveyed 58 participants, which may not be representative of a larger cohort of veterinary clinicians. A survey in North American veterinarians regarding ethical conflicts reports that 32% of the participants often encountered conflicts with clients in how to proceed in terms of patient care. It found that 45% of the participants were sometimes asked to do something that felt like the wrong thing to do and 62% responded that there were times they felt they could not do the right thing[9]. The most common obstacle to do the right thing was the client's finances and sometimes the employer's or practice's policies. Commonly veterinarians concede in doing the requested procedures because of the legal status of animals as property[9].

Veterinarians may also experience a moral conflict when they perceive an inability or failure of the client to provide care for the patient[2,6,9,12], with euthanasia being the most extreme example of this. Moses reports that 29.3% of their participants sometimes or often receive what they consider to be inappropriate requests for euthanasia and that this is a source of some distress to almost 45% and severe distress to 18.7% of respondents or their staff [9]. Concerns about the perceived impact of euthanasia on the veterinarian's psychological wellbeing have led to this potential moral conflict receiving the most attention from authors[16,21,53-58]. There is consistent empirical data confirming a relationship between animal euthanasia, moral stress and psychological anguish in shelter workers[16,59]. Furthermore, Whiting and Marion report a syndrome similar to PTSD for workers asked to cull hundreds of healthy pigs in an epidemic event[53]. Bartram and Baldwin include in their literature review the possibility of a relationship between euthanasia of animals as one of several risk factors for suicide in veterinarians[60,61], but empirical evidence does not support this claim[22]. Tran, in a cross-sectional study that surveyed 540 Australian veterinarians, found no relationship between administration of objectionable euthanasia (euthanasia that the veterinarian did not agree with) and the mental health variables assessed (depression and suicidal behaviour). Frequent euthanasia (including objectionable euthanasia) had a weak positive relationship with depression, but the influence of this in the variance of depressed mood was small (1%)[22]. Similarly, a

Canadian qualitative study reports that most of the veterinarians interviewed would perform convenience euthanasia, with their decision being influenced by their perception of the owner-animal bond[62]. Neither of these studies, however, discuss the number of objectionable euthanasia the participants performed or the overall effect of other forms of moral conflicts on the prevalence of psychological ill-health. Overall, they suggest that while euthanasia may be an important occupational stressor for veterinarians, analysing the relationship between moral conflicts and other modifying factors associated with occupational stress and psychological ill-health in veterinarians could give us a better understanding of their combined impact in the veterinary profession.

The literature outlines other common moral conflicts for veterinarians, for example: observing and reporting animal abuse, dealing with colleague incompetence, conflict of opinions between colleagues, breaking client confidentiality, lack of use of analgesia, performing unnecessary procedures, providing care they consider futile and inappropriate provision of medications and certificates[2,6,9,12,63]. However, the moral conflict experienced most commonly is client economic constraints impairing appropriate care for the patient[6,9,56,64]. A recent survey of 1,122 veterinarians found that 77% of the respondents viewed economic limitations as a moderate or primary contributor to professional burnout[56]. This view was verified by the positive correlation found between respondents' perceived economic limitations from clients and their level of self-reported professional burnout[56]. Most respondents felt that economic constraints limited their ability to provide the level of care they wanted. This finding is consistent with the finding that financial constraints are an ethical dilemma consistently encountered by Danish veterinarians[64]. While neither of these studies explicitly examined moral distress, the authors conclude that clients' economic limitations are an important cause of career dissatisfaction and burnout[56] and a major psychological challenge for the participating veterinarians[64].

How veterinarians perceive a situation as a moral conflict, frame moral questions and deliberate on ethical decisions is ingrained in the veterinarian's own morality, experiences, background, emotions and judgement. Therefore, what one person may find unethical or immoral another may not[2,5,7,65,66]. Each step in the moral deliberation process is affected by several modifying factors. These factors include, among others, their own morality, perceptions of animal value, expectations of clients, role perceptions, experience, colleagues' advice, formal training, intuition, logical thinking and self-awareness/avoidance of self-harm[2,5]. The veterinarian may then act in several ways depending on the specifics of the conflict. The veterinarian then may choose to report a case to animal welfare authorities, alter their method of communication to be more persuasive, proceed to euthanise an animal, act without the owner's permission, use deception, refuse service, terminate the veterinarian-client-patient relationship or offer that a charity or themselves to take ownership of an animal[2]. The most common response from surveyed veterinarians was lengthy discussion about the situation with clients or peers [9]. Whether or not these actions result in moral distress or moral comfort will depend on their own morality, contextual factors relating to the situation, and intrinsic factors such as self-awareness and personality.

The conditions required for the development of moral distress from moral stressors have seen limited investigation in the veterinary profession. The intrinsic and extrinsic factors that modify the response of the veterinarian will impact the perception of a situation as a moral conflict and the subsequent moral deliberation process. The outcome of the moral deliberation process will depend on whether these factors are perceived as leading to the anguish of moral distress or the satisfaction of moral comfort. The veterinary context is different from other healthcare settings[67]. The differences between situations that veterinarians face in contrast to their medical counterparts are enough to require further research in veterinary professionals, rather than extrapolating only from medical nurses or other healthcare providers.

Modifying factors and outcomes of the moral deliberation process for veterinarians

While some of the modifying factors that influence the response to a moral stressor have been described in the literature, the overall relationship between moral distress, modifying factors and the effect these may have on a veterinarian's mental health, their ability to provide care, job satisfaction and attrition is yet to be investigated. The literature in medical nurses describes some of these modifying factors as constraints[10,19]. However, there are many other modifying factors that are not necessarily considered constraints[8], such as personality traits[12] and the moral value the individual places on animals[2]. The development of a moral distress scale contextualised for veterinarians would be useful to further assess the impact of moral stress on the mental health of veterinary professionals.

One factor confirmed to influence the development of moral distress in veterinarians is personality. Personality traits such as neuroticism and trait perfectionism have been linked to experiences of anxiety, depression and lower well-being in veterinarians[12,68]. A study involving 363 UK veterinarians concluded that personality traits have a stronger influence on the outcome of occupational stressors than environmental factors. It also concluded that veterinarians who have high neuroticism traits experienced significantly higher levels of occupational stress[68]. Furthermore, the cross-sectional study by Crane *et al*., surveying 540 Australian veterinarians, established a relationship between trait perfectionism and moral distress. This study concludes that the presence of trait perfectionism enhances and increases the risk of developing moral distress from moral conflicts in the surveyed veterinarians[12].

There is no literature discussing the influence of moral competency and moral integrity in veterinarians as there is in medical nurses. However, a UK study that evaluated ethical reasoning in 65 veterinarians concluded that the ethical reasoning skills of clinical veterinarians may be insufficient to meet the demands of the job[35]. Some authors have discussed education in ethics as a potential tool to understand ethical reasoning and potentially reduce the development of moral distress[39]. For example, Avery explains that an understanding of welfare and ethics can alleviate the guilt and stress that veterinarians can feel when exposed to euthanasia[54] and Richards

mentions that formal training in bioethics was an important contributor to ethical decision making in the participants of her study[5]. However, a survey of North American veterinarians found that 71% (n=889) reported receiving no conflict resolution training while at university[9]. It could be theorized that education in ethics could modify the development of moral comfort instead of moral distress. Developing ethical knowledge and improving moral competency has been shown to alleviate moral distress in medical nurses[14]. The hypothesis is that a similar response may take place in veterinarians[5,9].

Occupational stressors have been reported as modifying factors in the development of moral distress in medical professionals. There is little evidence of the effect of occupational stressors in veterinarian's moral stress but there is wide evidence supporting the presence of occupational stress in these professionals[44,47,48,69]. Common occupational stressors such as longer working hours per week contribute to the higher perceived stress experienced by veterinarians when faced with moral conflicts[12]. Public perception has also been reported as an important occupational stressor when a veterinarian is perceived to fail their professional duty to protect animals[2,53]. All these factors contribute to the stress experienced by the veterinarian in their daily duties and may modify their moral deliberation process.

The relationship of moral distress in veterinarians to professional attrition has not been widely explored. In the US, despite work-related stressors, a large percentage of veterinarians stay in the industry[69]. Similar reports have emerged in Australia, with expectations of an oversupply of veterinarians in 2015[70]. A longitudinal study that surveyed 134 veterinarians 20 years after starting the veterinary science course at The University of Queensland reported that after 15 years 77% of the respondents were still doing veterinary work[71]. However, paradoxically, in Australia there is an anecdotal increase of employment need for veterinary clinicians with two or more years of experience (Eagleton, pers. comm.). It is possible that this is related to increased professional stressors which may include moral distress. For example, a relationship has been established between occupational stress and veterinary career attrition. In a cross-sectional study surveying over 11 000 US veterinarians, 16% of the participants planning on leaving the profession reported serious psychological stress whereas only 9% of those not planning to leave the profession reported similar stress[69]. A report on euthanasia technicians mentions that these professionals recommended to their colleagues to leave the job if the moral stress of euthanasia became unbearable[57]. Although this study was performed in shelter workers who were not veterinarians, there is a possibility that a similar scenario could be seen in veterinary clinicians. These findings highlight the need for further research into the relationships between veterinary career attrition and work-related stress, including the lightly explored area of moral distress.

Conclusion

Moral distress is an important occupational stressor that has deleterious effects on the professionals that experience it. Moral distress stems from situations related to conflicts of interest, which when perceived to go against the professional's own morals can lead to emotional and psychological anguish. The development of moral distress from the experience of moral conflict is modified by several factors that impact each step of the moral deliberation process. Veterinarians are frequently exposed to morally conflicting situations which often stem from conflicts of interest between clients, patient needs, professional duties and social expectations. However, moral distress in veterinarians has not been widely studied. There is correspondingly limited evidence to understand the relationships between moral distress, psychological outcomes, modifying factors, job satisfaction and attrition in veterinarians. Given the high levels of psychological distress they experience, investigating the effects of moral distress in veterinarians becomes imperative in the hope of improving their wellbeing. Further studies could include the development of a moral distress scale for veterinarians and evaluating the relationship between moral distress and job satisfaction, wellbeing and attrition in veterinarians.

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Chapter 3: Why do veterinarians leave clinical practice? A qualitative study using thematic analysis

Summary

Moral distress is an important occupational stressor experienced by veterinary clinicians. Moral distress has been associated with attrition in healthcare professionals but this relationship has not been investigated in veterinary clinicians. Furthermore, attrition from clinical practice is yet to be fully investigated in the veterinary profession. As mentioned in chapter 1, studies in relation to attrition and retention in veterinarians have limitations. Previous studies have reported intention to leave or attrition from the profession altogether or have focused on specific cohorts such as new graduates or veterinarians in rural practice. As of yet, an in-depth investigation of reasons for attrition from veterinary clinical practice is yet to be done. From this exploration we can assess whether moral distress emerges as a contributing factor for attrition from veterinary clinical practice. In chapter 3 we will explore the reasons for attrition from veterinary clinical practice using thematic analysis. This study was published in the Veterinary Record in 2021.

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Why do veterinarians leave clinical practice? A qualitative study using thematic analysis

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Abstract

Background

Veterinarians have an important role in society and having an adequate veterinary workforce is not only important for their communities but also nationwide. Lately, there have been anecdotal reports regarding veterinary practices struggling to find clinicians as well as evidence of mental ill-health in veterinarians. Furthermore, the Australian Veterinary Association annual workforce survey shows an increased percentage of veterinarians intending to leave practice from 2017 to 2019. Although many factors for attrition have been described in other professions, reasons for veterinarians to leave practice are not well understood.

Methods

This study investigated why veterinary clinicians leave clinical practice by using Thematic Analysis to analyse 26 semi-structured interviews of former veterinary clinicians in relation to their work experiences and reasons for leaving. Interviews were done from February-April 2018 either face to face, via teleconferencing or telephone. Participants were recruited from each Australian state except for New South Wales.

Results

The results showed that a combination of personal and work-related factors influenced the participants to leave clinical practice. In Personal Factors participants described the internal and external circumstances that impacted on their personal lives such as personal relationships, experiencing negative thoughts and emotions, physical and mental health, core motivations and beliefs, alternative professional and personal interests. On the other hand, Work Experiences described situations, experiences and statements directly related to the participant's

veterinary clinical work such as workplace relationships, employment conditions including remuneration and working hours and clinical experiences such as negative clinical outcomes. Furthermore, interlinkages between these two themes were revealed in participants' responses.

Conclusion

This study highlights factors that contribute to attrition from veterinary clinical practice. The narrative indicates that the interlinking of such factors influenced the decision-making process to leave clinical practice in this cohort of former veterinary clinicians. Further research is required to understand the full implications for veterinary clinical practice and inform intervention strategies for retention.

Introduction

Having an adequate veterinary workforce to meet the needs of society is critical[1-4] and attention is needed to understand the factors that drive it. This is particularly the case because concerns with the supply of veterinarians have been raised. In 2015, the Australian Veterinary Association (AVA) suggested a potential oversupply of veterinarians and predicted underemployment[5]. A 2018 economic model report on veterinary professionals (not on veterinary clinicians) in the USA concluded that the number of small animal veterinarians grew faster than the demand, stagnating veterinary salaries[6]. However, veterinary workforce surveys released in 2019 report that Australian veterinary clinical practices, regardless of their geographical location, struggle to fill their positions, some waiting over 12 months to fill vacancies[7,8]. Furthermore, the percentage of veterinarians working in a 'non-veterinarian role' such as teaching, business management, computer programming increased from 18% in 2017 to 27% in 2019[7,9]. Whether this paradox can be explained with normal labour market fluctuations or if attrition of veterinary clinicians is indeed a problem for the veterinary industry is not clear.

Employment models in non-veterinary industries suggest that elements of personal, organisational and environmental factors contribute to voluntary employee turnover from a workplace or organisation[10-13]. For example, Lee and Mitchell's[11] Unfolding Model of employee turnover mentions work-related factors (e.g. change of company ownership) and personal factors (e.g. values, learned experiences) as potential 'shocks' that trigger employees' decision-making path to leaving a job. In veterinary sciences studies have reported reasons for veterinarians to resign including: poor remuneration[8,14], perceived stress and anxiety[8], parental and family care[7] and change of interests[14]. However, the complex relationship between these factors and attrition is yet to be fully explored.

This study aims to understand what factors are associated with a veterinarian's decision to leave clinical practice. This was achieved by analysing the working journey and decision-making process of 26 former veterinary clinicians resulting in attrition from clinical practice. A qualitative research approach was used in light of the dearth of empirical data investigating attrition in veterinary clinical practice, since this allows for deep exploration when an area is not yet well understood and allows wider understanding of the participants' experiences and perspectives[15-18]. Furthermore, this qualitative analysis sets the initial exploratory basis for future quantitative research in this area.

Methodology

A qualitative research design was used to understand the contextualized subjective experiences[16,19,20] in former veterinary clinicians. The methodology used was inductive (builds concepts and theories from the data)[16], the

methods were thematic analysis as described by Braun and Clark[18,19] and the coding followed the guidelines by Saldaña [21].

Participants

Participants were recruited through social media platforms, AVA social media groups and communications sent by four of the seven Australian Universities that offer the veterinary degree. Recruitment occurred from December 2017 until March 2018 and stopped when data saturation (no new categories or links between categories were found) was reached [22]. Participants did not have an established relationship with the research project and researcher goals were not discussed during interviews. The selection criteria required participants not to be currently engaged in clinical work, defined as: 'diagnosis and treatment of animal patients either individuals or herds'. Selection criteria also included: having worked in clinical practice in Australia for six months or longer and have stopped clinical practice no longer than ten years ago. Participants gave informed consent and the project received Human Ethics approval by The University of Adelaide (H-2017-229).

Interviews

A total of 30 semi-structured interviews were conducted following the in-depth interview guidelines of Liamputtong[16] after a pilot test of four interviews. The initial part of the interview asked the participants about their working journey including the positive and negative experiences they had while in practice. The second part of the interview asked the participants to describe why they left clinical practice. The outline of the interview can be found on Appendix 1. After initial recruitment and data analysis, the sample population was narrowed down to include only former veterinary clinicians that had left clinical practice prior to retirement. A total of 26 interviews were analysed after this exclusion.

Description of participants

Twenty-six interviews were selected for thematic analysis. Participants all lived in Australia, had worked as veterinary clinicians for at least six months and had left clinical practice for no longer than 10 years. Out of those, 18 identified as female. Furthermore, nine had worked in small animal practice only, 14 had work in both mixed or production animal practice as well as small animal and three had worked in a combination of small animal practice and other type of veterinary clinical practice such as zoo animal practice. Only five participants had worked in metropolitan region only, two had worked in rural or semi-rural regions only with the remaining participants having worked in both metropolitan and rural regions. The years of experience in clinical practice ranged from one to 40 years. The time since leaving practice ranged from four weeks to 10 years. The participants' current occupation varied with 15 still working in the veterinary profession in a non-clinical capacity.

Analysis

Interviews were conducted in person, via videoconferencing or telephone from February 27th 2018 – April 28th 2018. The interviews took between 36 and 110 minutes each. All interviews were audio recorded with the interviewees' permission and then the transcripts were de-identified. The interviews developed into an in-depth exploration of the veterinarians' clinical journey with a focus on the factors that influenced their decision to leave practice. Although participants described both negative and positive work experiences, only the experiences that were associated with the research question (influential factors to leave clinical practice) were included in the analysis. The transcripts were checked for accuracy by comparing the audio recordings and the text prior to analysis and analysed using NVivo 12®. A total of three (12%) of the interviews were randomly selected for member checking, where the transcript was reviewed by the participant to ensure the responses were conveyed correctly, and feedback was accounted for in the analysis[16,23].

The data coding structure was developed with input from all four authors: a veterinarian currently working in practice (AAM); two veterinarians currently working in academia (SMM, SJH); and a clinical psychologist currently working in academia (MLM). Data analysis started as open coding of the entire dataset (generating multiple patterns from the data) completed by the main author (AAM) followed by selective coding (organising found patterns into structured themes) to identify initial themes and sub-themes [21]. The structure of themes and sub-themes was reviewed iteratively by all four authors, with additional discussion on coding of individual quotes between AAM and SMM. A final review was conducted on the dataset to ensure no additional subthemes were found and that all codes were associated with one subtheme only. A codebook was created containing the themes and sub-themes identified in the analysis, together their descriptions and illustrative quotes. This was reviewed by all four authors and revised to ensure accuracy in coding. Inter-coder agreement was established by two of the authors (AAM and SMM) independently coding three (12%) of the interviews. Consensual agreement was evaluated using transcribed paragraphs as the unit of analysis. Across the interviews analysed, pre-discussion agreement was 67% and post-discussion agreement was 97%[24].

Results

Participants' decisions to leave practice were influenced by two main themes: Personal Factors and Work Experiences, each with several sub-themes. Interviews suggested that elements of both Personal Factors and Work Experiences interacted with each other and acted as facilitators in the decision to leave clinical practice; a process that is represented in Figure 1. The results below contain a description of each theme and sub-theme, together with the way in which factors combined in influencing participants to leave practice. Each of these are illustrated by sample quotes. Further quotes illustrating each sub-theme and the relationship between these in

influencing participants' decision to leave can be found on Appendix 2 (Personal Factors) and Appendix 3 (Work Experiences).

Figure 1: Representation of the combination of themes contributing to the participants' decision to leave veterinary clinical practice

Personal Factors (Appendix 2)

This theme describes the internal and external circumstances related to the participant's personal lives. Personal factors were at times impacted by veterinary clinical work, at the same time the participant's personal lives also influenced clinical work.

Personal Factors has six subthemes: Alternative professional interests; Motivation, character and beliefs; Negative thoughts and affectivity; Other activities and personal time; Personal relationships; and Physical and mental health and fatigue.

1.1 Alternative professional interests: Participants described other professional interests and opportunities for work, whether they occurred prior to veterinary training or developed during their time as a clinician.

> *I had always thought of doing similar work to what I'm doing now, in more food-security-based work (…) I came into vet school already thinking that that's what I wanted to do* [P13]

1.2 Motivation, character and beliefs: This sub-theme encompasses the personal perceptions that shaped the participant's view of their surroundings and thus clinical practice. This includes the motivations they had to become a veterinarian, their perception of their own character; beliefs regarding capabilities, confidence and limitations as well as their personal values.

> *I don't like animals being treated as commodities, (…) I didn't want to be dealing with cows and things that were just considered as units of production (…) I need to make it my job to make life better for animals and to be their voice ultimately. That's where it's all came from.* [P6]

1.3 Negative thoughts and affectivity: Affectivity is described as an individual's experience of emotions, either positive or negative[25]. In this case negative affectivity refers to negative thoughts that can elicit a negative emotional state. Negative thoughts and affectivity described during the interviews often (but not always) arose from experiences as a veterinary clinician.

> *I was thinking: "I'm so tired that if I just crash the car, then I wouldn't have to go to work", and I was like, "Oh, okay. This is really bad" like that's not good.* [P7]

1.4 Other activities and personal time: Participants described their ability (or lack of) to participate in other activities such as hobbies and sport and being able to relax. This sub-theme was also often discussed in relation to clinical work as their schedules and other working conditions had an impact in the participants' personal time.

> *I couldn't do any regular social activities, sports activities or whatever that required a regular attendance on the weekends so that was quite frustrating.* [P18]

1.5 Personal relationships: This sub-theme describes the participant's personal relationships with family, friends, care giving responsibilities and support networks, how they were impacted by their clinical work and how they influenced their decision to leave practice.

You miss out on dinners. You miss out on seeing your children in the evenings. Catching up with friends in the evening as well. [P22]

1.6 Physical and mental health and fatigue: This sub-theme contains the influence of both physical and mental health to the participant's decision to leave practice. This includes poor mental health as well as the mention or description of physical exhaustion and fatigue whether work related or not.

As time went on, I started having mild notions of panic attacks, racing heart, sweaty palms, nausea (…) I started having heart arrhythmias a week after that. [P24]

Work Experiences (Appendix 3)

This theme relates to situations, experiences and statements directly related to the participant's veterinary clinical work. In this theme participants discussed what it was like for them to work as a veterinary clinician. Furthermore, work experiences at times were interlinked. For example, P7 describes the link between their workload, inability to get a break and inability to deliver the desired standards of patient and client care in the following quote:

(…) There were scheduling issues there. I was always getting double booked. I was always getting things squeezed in. I never had lunch (…) I struggled with that because I knew that we could do better for the clients and for their pets and weren't because we're just trying to do as much as possible. [P7]

Work Experiences is divided in three sub-themes each with component categories.
2.1 Clinical experiences: This sub-theme refers to experiences that are intrinsic to clinical work. Participants discussed: moral and ethical conflict, patient care and professional growth. In moral and ethical conflict, participants discussed situations that conflicted with their ethical and moral values, how they responded to such situations and the emotional impact that such conflict had on them.

'It conflicts with generally your morals because, as a vet, you want to help animals and they're *saying* [clients]*, "No. This value is not enough to warrant that." It's a bit tough.'* [P22]

In patient care participants discussed aspects related only to the diagnosis and treatment of animal disease and care. This included areas of clinical work they did not enjoy or found stressful (e.g. emergency work, surgery, dentistry), adverse clinical outcomes and situations where they were not able to meet their desired standards of care.

'I broke the mandible of the cat and I felt awful, and I became very sheepish or reluctant to do cat dentistries pretty much thereafter (…) I hated doing cat dental'. [P26]

Finally, participants mentioned boredom and their inability to upskill as a clinician in professional growth.

'It does become quite monotonous, just teeth, and ears, and lumps, and vaccinations, and stuff.' [P3]

2.2 Employment conditions: This sub-theme relates to working conditions which were unrelated to the diagnosis and treatment of patients and were more managerial in nature, often job specific. These are divided in: Pay and remuneration; Safe working conditions; Workload and schedules and Other employment conditions. Pay and remuneration is where participants discussed dissatisfaction with wages and perception of their value as well as the financial pressure from practices to increase profit.

'The financial reward wasn't equitable to my skill set and what was expected of me both from the clients and the boss.' [P14]

Participants also mentioned the importance of safe working conditions including concerns regarding their health and safety and situations when they were injured at work.

'I had an accident preg testing a cow. I preg tested a heifer that jumped the fence and pretty much destroyed my elbow.' [P4]

A category that was discussed at length by several interviewees was related to work schedules and workload. This included the amount of work, time available to complete such work and how these impacted their work-life balance (if they were staying back completing medical records) and patient care (if they are required to care for more patients than time allows).

'*I would start at 8:00am and routinely not finish until 10:00pm. That's not being on call. That's just a day.'* [P15]

Finally, working conditions that were key elements to the participants' decision to leave, but had no individual category, were categorized in one group called 'Other employment conditions'. This category includes experiences such as involvement with regulating authorities, litigation and requirements for registration.

'(…) when you go to registration, each year, they ask how many CPD [Continuing Professional Development] *points you have. I have zero.'* [P8]

2.3 Workplace relationships: This sub-theme relates to human interactions within the participant's workplace which were often negative. It was divided in relationships with: Clients; Employer; and Peers and team. Relationships with clients that actively influenced the participants to leave practice include the stress and sadness elicited from a client being unable to care for their animal, as well as resentment with clients and their demands.

(…) *just the volume of it* [client interactions] *was not conducive to [laughs] my happiness (…) just the volume of clients. Just the volume of clients and meeting new people throughout the day is tiring.* [P18]

Relationships with employers was a common influential factor for disillusionment with clinical practice and several participants reported negative relationships either with the owner of the practice, practice management or managerial hierarchies. The presence of a 'toxic work environment' and bullying was mentioned by some interviewees as well.

'*He* [employer] *was quite passive-aggressive. The amount of emotional and manipulation and just blackmail that was put onto me (…) I could recognize that he was being emotionally manipulative.* [P15]

Finally, some participants described negative inter-colleague experiences that influenced their decision-making to leave practice, including isolation from colleagues, lack of support from peers and pressure from support staff to increase workload.

'I felt betrayed by the other vet who said I had done a really bad job.' [P25]

Combination of factors

The narrative of each interview suggested that personal factors and work experiences were interlinked in participants' experiences, and that a combination of these influenced the participants' decision to leave clinical practice (See Figure 1). For example, P12 described the combination of lack of a salary increment and having an alternative profession as an influential factor for attrition.

Then the pay stopped. It didn't stop [laughs] it stopped increasing. [Work Experiences – Employment conditions – Pay and remuneration] *I just kept looking at it and thinking well, I had another career that I could be earning a lot more and working a lot less.* [Personal Factors – Alternative professional interest] *That was the*

deciding factor in the end. I could double the pay and work two days a week rather four days a week. [chuckles] [P12]

Furthermore, some of these interactions influenced participants in their decision to leave practice. For example, throughout their interview, P21 described a combination of stress associated with clinical work, family commitments, personal beliefs and a career alternative contributing to their decision to leave clinical practice which can be summarized in the quote below:

(…) [there were] *things that I didn't like about the job. You can't pick and choose. You can't not do some of the job. You can't just say, "I'm not going to get* [a patient] *hit by a car* [Patient care] *because I feel it's a bit stressful* [Negative thoughts and affectivity]*" [laughs] It's just not possible. I thought, "At this stage of my life, do I really want a job that's going to really stress me out?* [Negative thoughts and affectivity] (…) *it just wasn't the type of job that I felt that I could cope with while I was also managing three children* [Personal relationships] *(…) Also, I just don't think that's where my strengths lie* [Motivation, character and beliefs]*. I worked elsewhere before. I've had a really great job elsewhere. A couple of great jobs. Just really worked out that my strengths lay elsewhere.* [Alternative professional interests] [P21]

Discussion

This study aimed to understand the reasons why former veterinary clinicians leave clinical practice. Two major themes emerged: Personal Factors and Work Experiences, each with several sub-themes. Furthermore, the participants' decision to leave practice was influenced by elements of both themes and these appeared to be interlinked. Similar findings regarding such combination of factors have been reported in previous employee turnover research where the relationship between more than one factor is expected[10,11,26] and the decision to resign is often multifactorial[10-13,26-29]. Moreover, the Unfolding Model of Voluntary Employee Turnover[11] shows a four-path decision-making process in employees' decision to resign that contains interlinked personal and work-related variables. These variables include: a triggering work-related event, personal characteristics, values and memories, presence of a job alternative and slow development of job dissatisfaction. More specifically, the results from this study resemble a model presented by Dubey[12] in employees of humanitarian organisations which indicated: Personal, Work-related and External factors as the main categories for employee turnover. Finally, Iverson[13] also reports similar variables in hospital employees indicating that employee turnover was influenced by personal, environmental (job opportunity) and job-related variables as well as employee orientations[13]. The current study suggests that veterinarians seem to follow similar patterns when they choose to leave clinical practice.

Motivations, character and beliefs

Perceptions of values and beliefs that emerged as an influential aspect for the participants and included factors that motivated them to be veterinarians as well as observations of their values, own capabilities, limitations, confidence and personalities. At times, elements of this sub-theme were interlinked to other personal factors or work experiences. For example, some participants discussed their lack of confidence in relation to some clinical activities (such as surgery) which became a source of stress (negative affectivity). In employee turnover theory both Lee and Mitchell[11] and Mobley[10] suggest that employees' personal characteristics and perception of personal fit in a company take part in the resignation process. Veterinarians may benefit from recognizing their own self perceptions and the impact of these in their work which may improve their emotional intelligence and job satisfaction. For example, self-awareness has been proposed to improve clinical encounters in physicians[30] and a similar link could be hypothesized in veterinarians between self-awareness, clinical outcomes and job satisfaction. Another practical implication to improve retention involves understanding employees' values and beliefs and what motivates them to choose clinical practice. It has been suggested that facilitating an individual's particular set of motivations can increase fulfillment with work and job satisfaction[31]. However, further research to establish a relationship between motivations, character and beliefs and attrition from clinical practice is needed to develop more specific retention strategies.

Negative thoughts and affectivity

Affectivity is recognized as an individual's experience of emotions, either positive or negative[25], and has been shown to have a relationship with job satisfaction[32,33]. The development of a negative emotional state (negative affectivity) was a recurrent topic among participants and this usually developed from negative thoughts. Although most factors eliciting negative thoughts and affectivity related to veterinary work, some participants also related it to personal factors. Similarly, former farm animal veterinarians report feelings of boredom, dissatisfaction and frustration, which contrast with the feelings of love and enjoyment towards the work described by retained farm animal veterinarians[34] and indicate a possible relationship between affectivity and attrition from clinical practice. Exploring the relationship between negative thoughts and affectivity and attrition from clinical practice using validated psychometric measures in veterinarians may prove an important future research avenue in investigating the sustainability of veterinary practice and to develop precise, evidence-based retention strategies.

Participants reported a variety of work experiences that elicited negative emotions. These included perceived low standards of patient care, negative clinical outcomes, moral conflict, lack of support from employers and interpersonal conflict. Some participants explained that these were exacerbated by fatigue and working long hours as well as intrinsic personal factors such as the way they approached cases and their perceived personalities. Similar work-related factors have been found to lead to disillusionment[35], work-related stress[36-38] and burnout[39] in veterinarians. Prior research has shown personal factors such as personality traits can

exacerbate occupational stress[40,41]. Although further research is required to understand the complexity of these relationships, it highlights working conditions that can trigger negative cognition and emotion (e.g. working long hours, negative clinical outcomes) in veterinary clinical practice. Identifying and managing those working conditions could be helpful in reducing negative affectivity in veterinary clinicians

Moral conflict

Moral conflict has been defined as a situation that conflicts with a professional's personal values[42] and moral distress is described as the psychological anguish that a professional can experience when they are unable to follow their desired moral path[43,44]. Both have been reported to lead to negative emotion and stress in veterinarians[36,40,42,45-47] and influence attrition in medical professionals[48-50]. Situations that created moral conflict were described by several interviewees including perceived animal negligence, clients' inability to pay for services and euthanasia of unwanted animals. Furthermore, in some participants moral conflict and stress contributed to their decision to leave practice. The veterinary literature reports sources of moral conflict similar to those reported by the interviewees[36,42,45,51-53], but there is limited research regarding the development of moral distress and its contribution to veterinary attrition. These findings suggest the veterinary industry needs to further investigate moral conflict in veterinary clinicians and seek strategies to measure and mitigate its emotional impact.

Working hours and workload

Working hours and workload, often related to work-life balance, were discussed by participants as contributing to their decision to leave practice. In UK farm animal veterinarians, after-hours work was a contributing factor for attrition since clinicians that were less often on call were more likely to stay in practice and those that reported poorer work-life balance were more likely to leave[54]. Work-life balance has been an important factor discussed by veterinarians in Australia and overseas[34,55-57] and along with work-family balance, it is a key aspect of job satisfaction in other professionals[58,59]. Workload itself regardless of scheduling was also a contributor to leaving clinical practice. Participants mentioned their inability to get through their workload on time, together with the perceived impact on patient care and their own fatigue. Similar findings arose from a UK survey in which 42% of recent graduates felt that expectations regarding workload were unreasonable[60] and an Australian study where veterinarians reported not having enough time per patient as a source of stress[37].

Control over work conditions, including speed of work, improves job satisfaction in veterinarians[61] suggesting that increasing autonomy in clinical activities, flexibility in working schedules and workload may increase job satisfaction. Job satisfaction is considered crucial to retention in medical nurses and childcare staff[62-64], indicating that further research into this relationship for veterinarians could prove useful.

Patient care, support and workplace and client relationships

When discussing areas of work they found stressful, some participants discussed the link between an adverse clinical outcome, lack of support and the impact on their clinical confidence. Some also discuss negative interactions with clients and the stress elicited by clients' demands. Although there are limited data regarding the effect of adverse clinical outcomes in veterinarians and its the relationship with attrition, a survey of US veterinarians reported that 30% of respondents experienced emotional distress in relation to medical errors and adverse clinical outcomes[65]. In physicians, medical errors and adverse clinical outcomes contribute to depression, low self-worth and sleep deprivation[66,67]. Furthermore, a relationship between client complaints and intention to change careers has been found in small animal internists[68]. Participants mentioned the relationship between support from employers and peers when adverse situations occurred. The literature also reports veterinarians discussing lack of support from employers as a contributor to stress[35,37]. Although adverse clinical outcomes and negative client interactions can be unavoidable in practice a supportive workplace can mitigate the emotional impact of those. For example, peer and clinical supervision[69] may play a key role in mitigating their emotional consequences and increase job satisfaction in veterinary clinicians. Furthermore, clinical decision-making in a supportive environment can improve confidence building in veterinarians[56] and supporting development could reduce staff turnover[70].

Pay and remuneration and other employment conditions

The combination between high work-related stress and low remuneration was mentioned as influencing the decision to leave practice by some participants in the current study. This mirrors the relationship between remuneration, high work-related stress and attrition in medical nurses[63]. Remuneration has been recognized as a key reason for employee turnover in other industries[27] and an important reason for intention to leave in Australian and UK veterinarians[7,8,14,54]. Furthermore, work satisfaction was mostly associated with satisfaction with income for male employed veterinarians and self-employed veterinarians of both genders[55], suggesting that improving remuneration may be an important influential factor for preventing attrition in veterinary clinicians.

Other employment conditions described by participants as influencing their decision to leave practice included occupational health and safety and registration requirements. Occupational health and safety was mostly discussed due to potential career ending consequences. Considering that a current survey reports that up to 71% of Australian veterinarians are injured at work[71], it may still be an important area of improvement for the veterinary industry. Finally, registration requirements for regulatory authorities such as the Veterinary Surgeons Board were mentioned as an important work-related reason for leaving practice by one participant and alluded to by others. Although these other employment conditions were not recurrent in most interviews, for some participants they were a triggering factor to leave clinical practice. The impact of registration requirements and authorities on clinical attrition in veterinarians warrants further investigation.

Alternative professional interests

Having another career option facilitated the decision to leave clinical practice for several participants, who continued working in what they considered adverse working conditions until they were able to move to a suitable job. This mirrors employee attrition models in healthcare and medical support workers[13,72] where job opportunity is an important contributor for staff turnover. Furthermore, having an alternative job is a crucial factor for attrition in employee turnover theory which defines the pathway and associated factors for employees to leave their jobs[10,11,26].

Overall implications

Taylor[73] describes two types of employee turnover: 'Controllable'; where the contributing factors can be controlled by management such as aspects of job dissatisfaction and 'Uncontrollable' where the contributing factors are outside of managerial control. There are aspects of the work such as working hours and increasing remuneration that can be directly controlled by leadership, additionally, employers could work towards enhancing contextual resources such as mentorship and establishing a supportive work environment thought to enhance resilience[74] and have a positive impact on retention. In this study some influential factors could be considered uncontrollable by employers, such as employee background, personal relationships and the emotional responses of individuals. However, some of these factors are within the control of individuals, and workplace training in enhancing resilience and emotional intelligence may have a positive effect on retention.

Limitations

The experiences and subjective perceptions of participants in this study may incur an individualistic and memory bias in recollection of events[16]. This was addressed to some extent in the study design by including only former veterinarians that had left clinical practice less than 10 years ago. Furthermore, some interviews were held over the phone or via video conferencing which may reduce the rapport between interviewer and interviewee possibly reducing disclosure, however there is little evidence suggesting that telephone interviews reduce quality in qualitative data[75]. Recruitment bias may have influenced the results, since participants may have been more willing to share their stories than other former veterinarians that left the profession not necessarily due to negative experiences. While the coding of participants' interviews was not reviewed by the participants themselves, interpretation bias was reduced by the use of iterative development of the coding structure based on review and input from multiple members of the author team[16]. The communicability of the final coding structure was confirmed with inter-coder agreement.

Conclusion

The reasons for veterinary clinicians to leave practice are complex: Work Experiences and Personal Factors were identified as the two main themes in these interviewees. The discussed factors, in combination, ultimately influenced attrition from clinical practice by the participants. Although there are personal factors that cannot be controlled by leadership in clinical practice like employee's background and values there are others that if strategically implemented (such as flexible working schedules and clinical peer support) could decrease stress, improve job satisfaction and potentially increase retention. Future quantitative research could explore how job satisfaction, moral stress, burnout and work-family conflict impacts attrition in veterinary clinicians. The results of these studies could be used to inform critical retention strategies for the profession.

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Supplementary materials

Appendix 1: Interview Questionnaire

Demographic information
Age
Gender
Year of graduation
University of graduation
Number of years working as a veterinary clinician
Area of clinical work *Ex: small animals, equine etc.*
Regions/ areas of clinical work

Open ended questions:
Two areas will be explored with broad open-ended anchor questions*

- Work Experiences:
o What was your role during clinical practice?
o Please describe the activities you performed during clinical practice
o What aspects of the job did you find enjoyable?
o What aspects of the job did you find challenging?

- Reasons for leaving:
o Please tell me about the factors that motivated you to become a clinical veterinarian.
o Please tell me about the circumstances surrounding your decision to leave clinical work

*****_Further questions will be developed during the interview according to your answers. You are free to stop the interview and not to answer particular questions._

Appendix 2: Table of the Personal Factors theme

Alternative professional interests
20 out of 26 participants shared responses coded to this sub-theme
Other professional interests and opportunities for work, occurring either prior to veterinary training or developed while in clinical practice
P1: *I remember thinking when I was younger, "Oh, I really want to be a department vet".*
P20: *Immediately after graduating, I was offered a PhD candidature (…)*
P8: *I started a bachelors of medicine and bachelors of surgery (…) I still did horse work on the side (…)*
P25: *My interest had changed and I wanted to have a business, but I decided I didn't want to have a vet clinic (…)*
P12: *(…) my life was different because I come from a completely different career and different industry. Then I always had that to compare it to (…)*
Motivations, character and belief
23 out of 26 participants shared responses coded to this sub-theme
Personal perceptions that shape the participant's view of their surroundings. Includes: the motivations they had to become a veterinarian, their values, perception of their own character; core beliefs and beliefs regarding capabilities, confidence and limitations
P13: *Always having animals, I really wanted to be a vet from a little kid. I was also quite academically inclined (…)* [Motivation]
P4: *When you're a bit older and bit more experienced, you tend to put your foot down and say, "This is not acceptable (…) It's totally unacceptable in my view (…) to get these young vets straight out of uni and expect them to do 36 hours without a break. Totally unacceptable.* [Values]
P2: *I generally don't like things that I don't feel I am good at.* [Perception of own character]
P15: *I am very an all or nothing person (…) I like to give it 100% and if I can't give it 100% I'm kind of not prepared to give it 50%.* [Perception of own character and capabilities]
P24: *I think it was my core beliefs that were affecting, my core beliefs of not ever being good enough, not wanting to fail.* [Core belief]
Negative thoughts and affectivity
24 out of 26 participants shared responses coded to this sub-theme
Negative thoughts and affectivity refers to negative thoughts that can provoke a negative emotional state which can be elicited from experiences in clinical practice.
P1: *I think it just got to a point where I felt terrible as a human being.*

P6: *I was stuck in the middle having to carry, taking on their* [clients] *anger and their guilt. I would be feeling for them, and for the animal, and taking all of that on myself which was a huge emotional burden to bear (…) getting to the point where you feel like you can't feel anymore.*
P16: *When I wasn't suffering from a crippling lack of self-confidence I actually liked to work.*
P11: *I was- got angry and anxious (…) particularly being at work, feeling really angry (…) I felt really angry, I feel hurting it* [patient]*, hurting myself*.
P17: *I just continually lacked confidence that I knew what I was doing.*
Other activities and personal time *18 out of 26 participants shared responses coded to this sub-theme* Ability (or lack thereof) to participate in other activities such as hobbies and sport and being able to relax
P5: [Work/clinical practice] *did get in the way of life balance like sort of you if wanted to, you know, get into a sporting team or sort of set up a regular exercise program.*
P12: *(…) that's the whole thing with the vet, you're never completely switched off, I don't think.*
P23: *I wasn't really able to relax very well (…) It's really distracting. It doesn't so much affect the balance of time that I'm spending on things, but it affects the balance of attention that I can give to different things.*
P26: *Maybe it's that notability that you just can't relax. Not just that, you don't know whether the phone's going to ring or not (…) You just can't really relax even though you're not working.*
P4: *(…) you don't go to the gym, you don't eat well, you don't do all these things (…) just work and there's nothing else you do.*
Personal relationships *19 of 26 participants shared responses coded to this sub-theme* Personal relationships with family, friends, care giving responsibilities and support networks
P1: *I was with a guy, the guy who I'm now married throughout that whole time (…) we certainly did not see each other. We were just like ships in the night basically.*
P19: *I think I probably became more withdrawn actually. I went out less. Got less social life (…) I know my parents were very worried about me (…)*
P11: *(…) if I got tired or anxious then I wouldn't spend quality time with the kids (…) relationships would probably be affected because I will just be tired or preoccupied.*
P26: *It* [work] *was a little bit family unfriendly (…) if we had sick kids, as well, it was getting a bit stressful trying to work out, between my wife and I, who'd have to stay home with our sick child.*
P21: *I didn't ever get to dinner; it was actually my engagement dinner. [laughs]*

Physical and mental health and fatigue *18 of 26 participants shared responses coded to this sub-theme* Physical health (or lack of) and mention of fatigue. This sub-theme includes clinical mental illness as well as the mention or description of physical exhaustion and fatigue whether work related or not
P3: *(…) it wasn't burnout, but it was exhaustion. It got pretty exhausting (…)*
P7: *I've always had issues with anxiety, depression, and excessive compulsive disorder (…)*
P9: *I had my own surgical journey (…) which highlighted my allergies, which is just escalated off the charts. I'd been diagnosed with anaphylactic and had an EpiPen (…)*
P10: *Physically very draining. Mentally straining. [chuckles] I got very tired. (…) physically and mentally very, very tiring (…)*
P23: *I would feel my heart in my chest at the noise of the phone (…) I used to have a physical reaction to the sound of it ringing.*

Appendix 3: Table of Work Experiences theme

Clinical experiences – Moral and ethical conflict
15 of 26 participants shared responses coded to this sub-theme
Circumstances that caused ethical dilemmas where the participant was unsure of which path was more ethical and moral conflict where the situation exposed the participant to a direct conflict with their own values
P6: *It's really, really difficult. There'd be times when you'd have to euthanize 100 cats only in one day. (…) That's distressing because it was a production line of cats coming to you and sometimes it was mothers with their litters of kittens. It was just horrific. That was really hard to deal with.*
P16: *It's not ethical to make me sell dog food and worming pills to people who don't necessarily need them.*
P21: *I certainly think you get challenged with your moral issues. There's that undercurrent of, "Am I doing the right thing" constantly.*
P14: *(…) the pet shop used to come to us and want puppies euthanize if they had too much stock (…) I refused actually. I said I wouldn't do it so I did find that really conflicting because for me, that was an ethics issue.*
P3: *That just doesn't sit well with me. To communicate the treatment options to the client, I believe that is the ethical approach but my boss was wanting me to say, "This is what we need to do" (…) it's unethical to provide them* [clients] *with* [only] *one choice (…)*
Clinical experiences – Patient care
18 of 26 participants shared responses coded to this sub-theme
Aspects related only to the diagnosis and treatment of animal disease and care including inability to provide desired standards of care, aspects of the work they did not like or found and negative clinical outcomes
P14: (…) *you weren't giving anyone the best you, and you knew that you are effectively letting down that patient at the back.* [Inability to provide desired standards of care]
P4: *My first GDV was with a nurse holding a textbook (…) That shouldn't happen but it did* [Inability to provide desired standards of care]
P26: *I didn't really want to do too much surgery* [Aspect of the work they did not like]
P25: *(…) it really was a point where if that caesarean had really gone really well and they had been happy and live puppies, potentially, I would have stayed longer in the industry.* [Negative clinical outcome]
P21: *The anesthetic death was a big one (…) It was perfectly healthy, dead. It was so traumatic for everybody.* [Negative clinical outcome]
Clinical experiences – Professional growth
17 of 26 participants shared responses coded to this sub-theme
Boredom and their inability to upskill as a clinician

P22: *(…) you've learned the majority of stuff you need to know to do 90% of the things you do every day, vaccinations, fleas, can be a bit repetitive in that sense. Also, just not learning new things and not being able to apply them very regularly if you do* [learn] *them.*
P8: [to] *do one particular specialty which you can do with veterinary science these days. In my day, you couldn't. I think that had a little bit to do with it (…)*
P15: *You can only see so many skin cases and vaccinate so many of the animals before you just want to jump in front of a bus or something. [laughs]*
P12: *I got to the point where I was quite happy with most GP consults, I was happy with dentals, I was happy with most surgeries, but I didn't find them overly challenging (…) getting a little bit bored with the job (…)*
P17: *After three or four years, I lost interest in further study. I stopped reading. My knowledge base just remained static. If not declining (…)*
Employment conditions – Pay and remuneration *21 of 26 participants shared responses coded to this sub-theme* Dissatisfaction with wages and perception of their value as well as the financial pressure from practices to increase profit
P10: *I think veterinarians are not paid anywhere near what they should be paid (…) the financial reward is very low.*
P13: *(…) you're not paid for out of hour's research to try and work out how I can get to the bottom of this case (…)*
P16: *(…) there was definitely a you-need-to-sell-more kind of vibe. Like, "Why haven't you sold dog food and worming pills to these people?"*
P4: *I effectively got constructively dismissed from my last job. Their argument was I was not generating enough money per hour on farms*
P22: *(…) probably another one is the wages as well. They're pretty low compared to other professions (…)*
Employment conditions – Safe working conditions *7 of 26 participants shared responses coded to this sub-theme* Safe working conditions. It includes concerns regarding health and safety and situations of work-related injury
P4: *I've had two shoulder reconstructions. I've now had two elbow reconstructions. I've had knee surgery. I've broken toes. I've broken ankles. All with work.*
P17: *I've always had this fear of being injured*
P10: *I suited up but I had failure in the equipment and I actually got exposed, massively exposed (…) I realized then that if the horse had Hendra, I had three weeks to live.*
P14: *We used to hold them* [patients] *for X-rays without fully gloved up and stuff (…)*

P26: *(…) a lot of the bulk of the work were (…) farmers who had poor facilities, that had poor fences, poor stock yards, and crushes, and that sort of thing (…) you just go marching out there to potentially get injured (…)*
Employment conditions – Workload and schedules *24 of 26 participants shared responses coded to this sub-theme* This includes the amount of work, time available to complete such work and their perception of work-life balance (if they were staying back completing medical records) and patient care (if they are required to care for more patients than time allows).
P7: *I knew that we could do better for the clients and for their pets and weren't because we're just trying to* [fit/do] *as much as possible (…)*
P4: *You might start at 3:30 in the morning and you'd still be there at 7:00 at night. Then you're on call (…)*
P5: *(…) you work throughout two to three o'clock in the morning (…) we used to still have to get to work at nine o'clock the next morning (…) you've been up for most of the night and then you had to sort of work the whole next day. It wasn't really sort of anything in place because you just had such a* [high] *workload (…)*
P18: *Sometimes I would see over 40 patients in a day (…) It was standard to do I guess 50 hours a week that was just what was expected.*
P25: *I got to the point (…) where I was working 60 hours a week.*
Employment conditions – Other employment conditions *8 of 26 participants shared responses coded to this sub-theme* Work experiences such as involvement with regulating authorities, litigation and requirements for registration
P3: *I had one notification to the board (…) on top of everything else it was* [stressful].
P11: [I am like]: *"is this going to be some court case? Am I going to be in massive problems here?" Yes, it was bad.*
P4: *WorkCover don't understand what we do as large animal vets.**
Workplace relationships – clients *19 of 26 participants shared responses coded to this sub-theme* Client relations such as: stress and sadness elicited from a client being unable to care for their animal, as well as resentment with clients and client demands
P15: *I think I probably was like, "People, I don't need them anymore." [laughs]*
P16: *'There are people* [clients] *you know it's not going to be easy with and that can be anxiety provoking.' (…)*
P19: *(…) clients would always accuse us of charging really high fees (…)*
P23: *I always found it really hard to let the owners take responsibility for the decision (…) if I had put things more strongly, then probably the clients would've gone with my* [recommendation]

P12: *He said, "(…) Every time I come in here you pricks rip me off." I said, "Hang on. Hang on. Hang on."-- I opened the door and said, "Take your cat and piss off."*
Workplace relationships – Employer and leadership *21 of 26 participants shared responses coded to this sub-theme* Negative relationships either with the owner of the practice, practice management or managerial hierarchies
P4: *(…) there was workplace bullying and sexual discrimination going on, female in the cattle industry and that kind of stuff (…)*
P13: *(…) my boss was really not valuing what we were giving to the practice, which was really difficult*.
P14: *At the end of the day, if they* [employers] *can shortchange the staff for money (…) then that's where there going go (…)*
P19: *I didn't get much support from my boss (…) I called him in one night when I had an emergency and he made it very clear that I was not to do that again.*
P21: *I can pretty much guarantee that my two male bosses would not give me assistance. In fact, they would make things difficult (…) It was the typical (…) "We've done it hard, you got to do it hard too." type of attitude.*
Workplace relationships – Peers and team *17 of 26 participants shared responses coded to this sub-theme* Negative relations or absence of relations with team including isolation from colleagues, lack of support from peers and pressure from support staff to increase workload
P7: *We had nurses doing things that were definitely illegal like not appropriate for a nurse to be doing.*
P12: *I didn't find other vets very supportive of things that might have gone* [badly]. *They are very quick to blame, very quick to judge.*
P13: *There was just one nurse who was bit of a dragon. [laugh] I'd just say she had a bee on her bonnet. (…) She was a nurse but she kept trying to pull power over everybody.*
P14: *That caused friction then all round, because then the vets would get cranky because the nurses would want to* [keep] *booking up things in (…) because they were getting paid (…)*
P17: *I think I was hoping, at that stage* [to go back to] *the multi-man practice where there's support and so forth (…) That wasn't offered and I just knew I couldn't carry on in a one-man practice (…)* [Isolation from colleagues]

*WorkCover: is a lay term used in reference to Workers Compensation which is a state-based national insurance scheme to provide insurance for employees that are injured at work.

Chapter 4: Risk factors associated with veterinary attrition from clinical practice. A descriptive study.

Summary

The results from the previous qualitative study reveal that a combination of Personal Factors and Work Experiences influenced these cohort of former veterinary clinicians to leave practice. Several sub-themes emerged including: motivations, character and belief; employment conditions; thoughts and affectivity and patient. The next step to understand attrition from veterinary clinical practice was to assess whether the emerging themes were applicable to a larger cohort of veterinary graduates. Moral conflict emerged as a category under patient care within the theme Work Experiences. However, a quantifiable association was still required. To achieve such goals a survey was created and disseminated to veterinarians that were currently working or had worked in Australia for at least six months. The following chapter focuses on the comparison of demographic factors and working conditions between current and former veterinary clinicians. The following study was published in The Australian Veterinary Journal in 2021.

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Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper.		
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i. the candidate's stated contribution to the publication is accurate (as detailed above);
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Risk factors associated with veterinary attrition from clinical practice. A descriptive study.

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Abstract

A sustainable workforce is important for the veterinary profession to meet the demands of society. To maintain a sustainable workforce, it has been recommended to retain veterinary clinicians. However, there seems to be an increasing issue with retention of veterinarians in clinical practice. In the following study, the researchers sought to understand the associations between demographic and work-related factors and attrition of veterinarians from clinical practice.

Responses to an online cross-sectional survey of 881 current and former Australian veterinary clinicians were analysed. A logistic regression model was used to identify and describe associations between attrition from veterinary clinical practice and: salary, working hours, role in practice, years of experience, field of work, interaction with regulatory authorities, region of work, and on-call duties. Lower salary, longer working hours, having on-call duties, and having worked in both rural and metropolitan regions were found to significantly (p<0.05) increase the likelihood of leaving clinical practice. The results may inform intervention strategies to assist the industry to retain veterinarians in clinical practice.

Keywords: Veterinary practice, Employee attrition, Employee turnover, Veterinary workforce

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Introduction

The sustainability of the veterinary workforce has received attention in the past decade. In 2015 the Australian Veterinary Association (AVA) Veterinary Workforce Modelling Report suggested an imminent surplus of veterinarians[1]. However, in later years surveys from both the AVA and private agencies have reported that the supply might not meeting the demands of veterinarians for clinical practice, as well as raising concerns regarding workforce retention[2, 3]. Private surveys from the UK and Australia show that while veterinary practices may be struggling to recruit veterinarians, the general number of registered veterinarians has been increasing[4-6]. It has been suggested that veterinarians may not be leaving the veterinary profession completely, only clinical practice[7], and that the best strategy to meet the demands of the veterinary workforce is to retain veterinarians[8, 9] rather than increase numbers of graduates.

Attrition and employee turnover can be used interchangeably to refer to the exit of an employee from a company. However, professional or career attrition indicates that the employee has not only left a particular place of employment but their career or profession altogether. In this study we are referring to veterinary attrition from clinical practice; this includes veterinarians that have stopped being clinicians but may remain in the veterinary profession in a non-clinical role or have changed profession completely. Overall, 9.2% and 8.5% of Australian professional service employees from different unspecified industries left their place of employment in 2020 and 2019[10, 11]; and The Australian Human Resources Institute reported an average organisational turnover rate of 18% in 2018[12]. Staff turnover in veterinarians has received some attention, in the UK, surveys of veterinarians shows an intention to leave current employment of 43.7%[9] and intention to leave the veterinary profession of 37%[13]. Similarly, a New Zealand article reported that 44% of recent graduates leave their first job in practice and further 16% intend to leave their first job[14]. In Australia, The AVA disclosed in their latest workforce survey that 7% (n=88) of the respondents were not engaged in veterinary work (clinical and non-clinical) and that 19% (n=230) were considering not working as a veterinarian (clinical and non-clinical) in the following year[2]. However, specific numbers on how many veterinarians leave clinical practice annually has not been investigated. Furthermore, it is unclear whether veterinary clinicians leave practice for alternative professional opportunities (in non-clinical or non-veterinary roles) or due to job dissatisfaction alone. In medical nurses the perception of being overworked and underpaid, working long hours, and lack of leadership and quality of work environments were linked to attrition from the clinical aspect of the nursing profession[15]. In early career teachers, lack of support, high workload, and isolation have been reported to relate to career attrition[16]. A recent UK survey reported that the three most frequent reasons for veterinarians' turnover are work-life balance, issues with management and salary[9]. In Australia, similar reasons for veterinarians to stop veterinary work were found over 10 years ago[17, 18]. However, reasons for attrition from clinical practice are less explored. A study in rural practice of US veterinarians found that the four key reasons for leaving rural veterinary practice in that study included: 1)

emergency duty; 2) time off; 3) inadequate salary and 4) family concerns[19]. The authors of that study suggest that emergency duty, time off and family concerns could be inter-related since personal time interrupted by emergency calls could lead to the perception of inadequate time off and be an inconvenience for the veterinarian and their family and friends. In the UK similar work has been done investigating factors associated with retaining veterinarians in farm animal practice. They found that veterinarians that stayed in farm animal practice were on-call less frequently, had regular staff appraisals, earned higher salary and those that had given up on farm animal work had worked slightly longer hours[8]. Although shortages of veterinarians have been widely reported in rural regions, there has been minimal comparison regarding attrition and retention between rural and metropolitan veterinarians. A clear relationship between these matters and attrition from veterinary practice is yet to be fully explored.

The aim of this study was to understand the relationship between demographic factors and employment conditions and attrition from clinical practice in Australian veterinarians. Specifically, the researchers examined a potential relationship between attrition and gender, field of work, on-call demands, career alternative, region of work, clinical role, being investigated by regulatory authorities such as the Veterinary Surgeons Board, salary, hours of work, age and years of experience in practice.

Materials and methods

Data acquired through a survey of current and former veterinary clinicians in Australia were analysed. Recruitment was achieved through approved Facebook groups and six out of the seven alumni offices of Australian universities that provide a veterinary degree. In order to participate in the study, the participants needed to either have worked or were working as a veterinary clinician in Australia. Additionally, veterinarians needed to identify themselves as either a veterinary clinician, which was defined as 'Veterinarians that diagnose and treat animal patients (individuals or herds)', or no longer working in clinical practice.

Survey

The survey was drafted using a framework derived from the results of semi-structured interviews which explored the career path of former veterinary clinicians[20]. The survey responses were collected between November 2019 and February 2020. Respondents who indicated they were currently working in clinical practice responded to survey B whilst those who indicated they had left clinical practice responded to survey A. Surveys A and B were mostly identical, using past tense wording in the questions for former clinicians. The questions analysed in this study were part of a survey that explored multiple possible factors associated with attrition from veterinary clinical practice. The analysis of this study focused on questions surrounding demographics including gender and age and veterinary employment conditions such as salary, hours of work, years of experience, field of work, region

of work, role in clinical practice, and whether they had been investigated by a regulatory authority. Finally, other professional factors such as university of graduation and whether they had a career alternative before becoming a veterinarian were also investigated. This project was approved by the Human Ethics Committee of the University of Adelaide (HREC H2017-229).

Description of the population and variables

Participants were divided into: 1) those currently working in clinical practice and 2) those who have left clinical practice prior to retirement. The continuous variables were reported as current for existing veterinary clinicians and just prior to attrition for former veterinary clinicians. In order to meet model assumptions for minimum number of cases some of the categories for the variables of region of work and field of work were grouped. For region of work, respondents that had worked or were currently working in semi-rural or rural regions were grouped in one variable which was compared to clinicians that had worked or were currently working in metropolitan regions only. Those clinicians that had worked in both metropolitan and semi-rural/rural regions were compared to those that had worked or were working in metropolitan only. For field of work, veterinarians working with wildlife and zoo animals as well as those working in specialist practice, and government or industry work with clinical duties were grouped together under the category of 'Other'. Equine practice was grouped as part of mixed and production animal practice. Clinical role grouped respondents as employed veterinarians, employers (including veterinary directors and practice owners) and other or multiple roles. Other variables analysed included whether the participants had been investigated by veterinary regulatory authorities, whether they had on-call duties, whether they had graduated from an Australian university and whether they had an alternative career or professional interest (in the veterinary profession or otherwise) prior to commencing work as veterinarians. The continuous variables included: 1) salary which was reported in Australian dollars per annum and this variable was adjusted for inflation based on the Reserve Bank of Australia Inflation Calculator; 2) hours of work which was defined as average hours in clinical duties per week; 3) age and 4) years of experience in clinical practice.

Data analysis

Cases were removed if they were over 75% incomplete or if the participant did not answer the outcome question on whether they had left clinical practice. Initial exploration of the data included description of the population per independent variable. Continuous variables were described using range, mean and standard deviation and categorical variables are described using percentages. Only the variables that had a significant contribution (cut off $p<0.2$) to the outcome variable were included in the regression model[21] which excluded career alternative and university of graduation. Age was removed as an independent variable to meet the multicollinearity assumption as age was correlated with years of experience. Hours of work underwent square root transformation to meet the assumption of linearity. Therefore, the variables included in the regression model were: gender, region of work, field of work, role in practice, on-call duties, being investigated by regulatory authorities, years of

experience, salary per annum and square root of average hours of work per week. The logistic regression model used data only from former clinicians that had left clinical practice before retirement and evaluated the dichotomous binary outcome as: had left clinical practice and currently working in clinical practice. The regression model met the required assumptions; the outcome was dichotomous, had more than one independent variable, variables were mutually exclusive, there were 10 cases or more per independent variable and data fit the test of linearity after a square root transformation of hours of work. Outliers were not removed from the model since they were perceived to be representative of the data.

Data were analysed using SPSS 26®. Significance was set at $p<0.05$.

Results

Overall description

Of 920 responses, 39 were mostly incomplete or did not respond to the outcome variable and were removed leaving a total of 881 valid responses for the analysis. Of those, 581 (65.9%) were still working in clinical practice and 300 (34.1%) had left clinical practice. Of the former clinicians 84 (28.8%) were retired and their responses were excluded from the analysis.

Data description

There were 561 (71.0%) females, 226 (28.6%) males and 3 (0.4%) were classified as 'other/prefer not to say'. There were 478 (60.7%) respondents that worked mostly in small animal practice, 226 (28.7%) worked in mixed animal practice, production animal practice, equine practice or a combination of the three and 83 (10.5%) worked in other fields. Other fields included: specialist practice, wildlife and zoo animal practice, and government or industry practice that included diagnosis and treatment of animal disease. There were 444 (56.5%) respondents that worked in metropolitan region only, 312 (39.7%) that worked in semi-rural and rural regions and 30 (3.8%) that had worked in both. A total of 578 (73.4%) were employed veterinarians and 143 (18.1%) were employers whereas 67 (8.5%) had multiple, undefined or other roles. There were 414 (52.7%) that did not have on-call duties and 372 (47.3%) that did. A total of 655 (83%) did not have a career alternative before becoming a veterinarian and 134 (17%) did. The majority, 529 (73.8%) had never been investigated by a regulatory authority and 188 (26.2%) had been investigated once or more than once. Finally, 742 (94.3) respondents had graduated from an Australian university and 45 (5.7%) had graduated from a university overseas. Table 1 shows the description of the population and the categorical variables.

For continuous variables, the population had an age range from 23 to 88 years with a mean of 45.1. The years of experience ranged from less than one to 60 with a mean of 15.8 years. Salary ranged between A$3,000 to A$300,000 per annum with a mean of A$88,02. The hours of work per week ranged between 4 and 90 with a mean of 40.4. Table 2 shows the distribution of the population in the continuous variables.

Table 1: Demographic description for categorical variables

Variable	Stayed in clinical practice n (%)	Has left clinical practice n (%)
Gender		
Females	420 (72.4)	141 (67.5)
Males	158 (27.3)	68 (32.5)
Other/Prefer not to say	3 (0.3)	0
Region of work		
Metropolitan only	340 (58.8)	104 (50.0)
Rural/Semi-rural	228 (39.4)	84 (40.4)
Has worked in both	10 (1.7)	20 (9.6)
Field of work		
Small Animal	362 (62.5)	116 (55.8)
Mix/Production/Equine	144 (24.9)	82 (39.4)
Other	73 (12.6)	10 (4.8)
Clinical role		
Employed veterinarians	411 (70.7)	167 (80.7)
Employers	119 (20.5)	24 (11.6)
Other	51 (8.8)	16 (7.7)
On-call duties		
No	365 (63.1)	49 (23.6)
Yes	213 (36.9)	159 (76.4)
Career alternative		
No	479 (82.6)	176 (84.2)

Yes	101 (17.4)	33 (15.8)
Investigated by regulatory authority		
No	370 (70.6)	159 (82.4)
Yes	154 (29.4)	34 (17.6)
Graduated from an Australian university		
Yes	542 (93.8)	200 (95.7)
No	36 (6.2)	9 (4.3)

Table 2: Description of the population for continuous variables

Variable	Stayed in clinical practice			Left clinical practice		
	Mean	+- SD	Range	Mean	+- SD	Range
Age	41.19	+- 13.11	(23-76)	45.91	+-12.70	(24-76)
Years of experience	15.98	+-13.28	(<1 - 51)	10.58	+-9.68	(<1 - 43)
Hours of work per week	37.18	+-14.37	(10-90)	45.04	+-12.28	(5-75)
Salary in Australian dollars per annum	88,92	+-51,75	(3,000-300,000)	74,64	+-31,61	(10,000–256,000)

Logistic regression modelling

A binomial logistic regression was performed to evaluate the relationship between attrition from clinical practice and selected variables. Data used included all current veterinary clinicians and former veterinary clinicians that had left before retirement. A total of 629 cases were included in the logistic regression model, which is 71% of the total number of valid responses (n=881). The model was statistically significant $x^2(10) = 201.21$ $p < .0001$ with a non-significant Hosmer and Lemeshow test X2 (10) = 12.296 $p = 0.138$ indicating goodness of fit. It explained 39.9% (Nagelkerke R^2) of the variance and correctly classified 81.6% of the cases, with a positive predictive value of 72.9% and a negative predictive value of 83.4%. Specificity was 93.5% and sensitivity 48.5%.

The regression model showed that male veterinarians had higher odds of leaving clinical practice than female veterinarians (OR 2.00). Veterinarians that worked in rural or semi-rural regions were less likely to leave than clinicians that worked in metropolitan regions (OR 0.2). However, veterinarians that had worked in both

metropolitan and regional practice were four times more likely to leave practice than those that had worked in metropolitan regions only (OR 4.11). Working in 'Other' clinical roles had a protective effect in comparison to small animal veterinarians (OR 0.21). There was no significant difference in attrition between small animals and mix practice, equine and production animal practitioners. Being on-call contributed significantly to leaving veterinary practice. Veterinarians that had on-call duties were ten times more likely to leave than those with no on-call duties (OR 10.10). Finally, longer working hours and lower salaries also contributed significantly to attrition from veterinary clinical practice. Table 3 presents the logistic regression results.

Table 3: Logistic regression results

Tabulated results of Binomial Logistic Regression. Including *B*, standard error of the unstandardised B coefficient, Wald predictor variable, *p* value, odds ratio (OR) and 95% confidence intervals for coefficient.

Predictor	**B**	**S.E.**	**Wald**	**Sig (p)**	**OR**	**95% C.I. for OR**	
						Lower	**Upper**
Gender††	0.69	0.25	7.49	.006	2.00	1.22	3.29
Region of work							
Metropolitan Only*			33.16	<.0001			
Rural and Semi-rural only	-1.58	0.33	23.23	<.0001	0.21	0.11	0.39
Has worked in both	1.41	0.65	4.79	.029	4.11	1.16	14.58
Field of work							
Small Animal*			6.81	.033			
Mix practice /Equine/Production	0.72	0.31	0.06	.814	1.08	0.59	1.96
Other	-1.56	0.61	6.51	.011	0.21	0.06	0.70
Clinical role							
Employed Veterinarians*			1.91	.384			
Employers/Practice Owners	-0.20	0.38	0.27	.603	0.82	0.39	1.72
Other roles	-0.65	0.49	1.78	.183	0.52	0.20	1.36
On Call	2.31	0.31	57.31	<.0001	10.10	5.55	18.39
Investigated by regulatory authorities	-0.56	0.30	3.59	.058	0.57	0.32	1.02

Experience	-0.01	0.01	0.56	.455	0.99	0.97	1.02
Hours†	0.64	0.13	22.62	<.0001	1.89	1.45	2.45
Salary	-0.02	0.04	26.44	<.0001	0.98	0.97	0.99

* Reference group
† Square root of average hours of work per week
†† Males compared to females

Discussion

The aim of this study was to evaluate the relationship between demographic and work-related factors and attrition from veterinary clinical practice. Out of 881 responses, 208 had left clinical practice before retirement indicating a veterinary clinician attrition rate of 23.6%. There are no previous figures on attrition from clinical practice making these findings difficult to compare. Previous studies report figures relating to attrition from the veterinary profession altogether rather than from clinical practice. In 2007, an Australian study showed that from two cohorts of Queensland veterinary graduates, 77% were still engaged in veterinary work 15 years post-graduation; out of those 85% were in private practice[18]. For example, more current reports show that only 4.8% of veterinarians were working outside the profession in the UK[22]. It is difficult to extrapolate these findings since the outcomes are not the same. Leaving the veterinary profession is different than leaving clinical practice as there are many employment options for veterinarians outside a clinical role (e.g. Epidemiology, public health, associated industries). Further research is required where there is a clear differentiation between attrition from clinical work and the veterinary profession. Findings show that hours of work, salary, on-call duties, gender and region of work were significant predictors for attrition from veterinary clinical practice. As expected from previous workforce surveys there were more females than males that responded which is consistent with the current gender balance in the profession[2]. Frequency of respondents per age group was also consistent with workforce reports, an indication that the results of this study may be representative of the veterinary professional cohort.

The number of hours worked as well as presence of emergency duties were significant predictors for attrition from veterinary clinical practice. The model shows that the odds for leaving clinical practice increased by 1.89 for every unit increase in the square root of hours worked. Having on-call duties increased the odds of attrition by 10 times. Hours of work has also been an important contributor for career attrition in medical nurses and physicians[15, 23]. It is also consistent with a qualitative study reporting hours of work as an important reason for attrition in former veterinary clinicians[20]. Hours of work showed borderline significance as a predictor for attrition in UK farm animal veterinarians but less on-call duties was significantly related with retention in the same study[8]. Furthermore, having limited time off and emergency duties (responsibilities and hours of work) were important factors for attrition from rural practice in US veterinarians[19]. There seems to be an indication that although hours

of work in general are important for veterinary clinicians, the relationship between hours and attrition may be more closely related to after-hours work.

Having on-call duties as a predictor for attrition may be indicative of a relationship between after-hours duties, general working hours and work-life balance. In interviews with 26 former veterinary clinicians, the interaction between work schedules and work-life balance was considered an influential factor for attrition from practice[20]. Furthermore, need for time off and presence of after-hours duties, was also reported as an influential factor for veterinarians to leave farm or rural veterinary practice overseas[8, 19, 24]. Finally, work-life balance was one of the most disliked aspect of the profession cited by veterinarians in the UK[9] and is an important element for job satisfaction in German veterinarians[25]. More research is required to understand the dynamic between job satisfaction, hours of work and personal time. However, addressing issues relating to perceived work-life balance and on-call duties could prove beneficial in order to improve retention and sustainability of veterinary clinical practice in Australia and overseas.

Salary and remuneration was another significant factor for attrition in this study and important reason for clinical attrition described in veterinarians in different fields[18, 20, 26]. A negative relationship between attrition and salary in the present study indicates that as salary increased, the odds of leaving the practice decreased, that is those that were on higher salaries were more likely to remain in the practice (or less likely to leave). This is a small contribution when comparing to other variables such as hours of work, on-call duties and having worked in both regional and metropolitan areas. It could be suggested that salary is less important to the decision to leave practice than other factors such as work-life balance. However, salary as a contributor to attrition has been shown to be related to both employee turnover and job discontent in veterinarians[9, 18, 20]. Although it might not be without challenges, finding financial profitability seems to be important for workforce sustainability in the private veterinary clinical workforce.

Region of work was also a contributing factor to attrition from clinical practice. The researchers found that veterinarians that had worked in semi-rural and/or rural regions were less likely to leave practice than those that had worked in metropolitan regions only. Furthermore, those that had worked in both metropolitan and regional practice had higher odds of leaving than those that worked in metropolitan only. All else being equal the likelihood of leaving clinical practice was 79% lower for rural and semi-rural clinicians compared with metropolitan only. The odds of leaving if the clinician had worked in both settings was 4.1. Previous studies have found that farm animal practices have problems with recruitment and retention of clinicians[19, 24, 27, 28] and although shortages of rural veterinarians has been considered an important problem,[29] there are few comparisons of attrition between metropolitan and regional veterinarians. It is expected that the job demands and working conditions are different in different regions of practice. For example, for rural practitioners, there seems to be a commitment to the 'rural lifestyle', working outdoors, being part of their communities and being involved with farm animal work[24, 30] which

can contribute to their retention. Furthermore, working in metropolitan regions can have different challenges (which are yet to be explored) that can trigger career attrition and employee turnover. Investigating these potential differences and implementing region-specific intervention strategies such as management of after-hours duties for regional veterinarians may be an important step in order to increase retention in the different regions of Australia.

Gender has been considered important in the literature on veterinary attrition[13] and was a significant contributor in this study. However, in contrast to previous studies which found that females had a higher attrition rate than males[9], we report males being more likely to leave than females. Other studies have found no link between gender and veterinarians leaving farm animal practice[24] or attrition from veterinary academia[31]. It is unclear whether gender is a predictor for veterinary clinical attrition. Significance may vary between populations and further studies are needed to adequately understand the contribution of this variable.

Other factors such as having a career alternative, conflicts with regulatory authorities, role in practice and experience have been discussed as a contributing factor for clinical attrition by participants in a qualitative study of former Australian veterinarians[20]. Those factors could have been important in isolation as individual contributors for that cohort of former veterinary clinicians. However, in this study, with a larger population and in the context of other variables that have a stronger association with attrition, they became less relevant.

Limitations

Limitations for this study include an inevitable recruitment bias. Former veterinary clinicians could potentially be less likely to have kept up to date with veterinary related communication. Although recruitment bias was minimised by using alumni offices as recruitment vectors thus inviting all veterinary graduates to participate, it is possible that former veterinary clinicians may be underrepresented. Additionally, the use of social media platforms can bias the sample towards the younger generations. Recollection bias could be elicited since some former veterinarians had left clinical practice over 10 years ago. Furthermore, response bias could occur since respondents that left practice because of dissatisfaction could be more eager in responding to the survey than those that had left for other reasons. Participants were asked whether they were currently working as veterinary clinicians but the question did not account for possible temporary step back from clinical practice such as parental leave. It is unknown whether respondents in these situations would have answered as current clinicians or not. It is important to mention that there were areas of the survey where the respondent was able to select multiple options. These included: region of work and field of work which may lead to overrepresentation of some categories and under representation of others due to having to categorise them into the groups they have worked at the most. Furthermore, it is important to consider the limitation with ‘other’ as field of work. This category

contains several sub-fields like zoo and wildlife veterinarians as well as government veterinarians that work on herd animals and small animal specialists. It was not possible to evaluate each of these sub-categories as indicators for attrition from veterinary clinical practice to fully understand the protective effect of this variable. Finally, the focus of this study was on attrition from clinical practice not the veterinary profession. The veterinary profession provides a vast range of non-clinical career alternatives which may provide fulfilling options for veterinarians that choose to leave clinical practice.

Having to do a square root transformation on hours of work make interpretation of the magnitude of the contribution of this variables to the outcome challenging. Finally, the model adequately predicted veterinary retention with a specificity of 93.5 but sensitivity was low (48.5) for attrition from practice. This could be due to some groups within the categorial variables having low numbers. However, the model's total predictive value was adequate and showed good model fit and the contribution of these variables should be interpreted as indicators rather than predictors. Further studies in larger population reducing the grouping of responses which yield low numbers may create better sensitivity values.

Conclusions

This study highlights key influential factors for attrition of veterinarians from clinical practice. Variables such as on-call duties, having worked in both in metropolitan and rural regions and hours of work seem to be strong predictors for attrition from clinical practice. Salary, gender, working in metropolitan regions only also contribute to attrition from practice. The results are consistent with similar factors influencing attrition in previous veterinary literature but provide new evidence in relation to the contribution of region of work and gender and attrition from practice. Considering concerns within the profession in relation to veterinary shortages, it becomes important to understand the factors contributing to this problem. Although the veterinary profession provides an extensive range of non-clinical options for veterinarians; the results of this study may inform strategies to increase retention of veterinarians in clinical practice.

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Supplementary materials

Survey: Demographic factors and employment conditions

COMMON SURVEY

Demographics

1- What is your age in numbers?
Open space for answer
2- What is your gender?
Multiple choice
- Female
- Male
- Other – *open space for answer*
- Prefer not to say
3- What is your university of graduation?
Multiple choice
- The University of Queensland
- The University of Sydney
- The University of Melbourne
- Charles Sturt University
- James Cook University
- The University of Adelaide
- Murdoch University
- I did not graduate from an Australian University
- Prefer not to say
4- Veterinary clinical practice is defined as: Veterinarians that diagnose and treat animal patients (individuals or herds).
How long have you worked as a veterinary clinician?
Continuous analogue Scale from 0-80
5- Veterinary clinical practice is defined as: Veterinarians that diagnose and treat animal patients (individuals or herds). Are you currently still working in veterinary clinical practice in any capacity?

Yes – Please follow this link (Survey B)

No. I have left clinical practice – Please follow this link (Survey A)

SURVEY A

1- How long ago did you leave clinical practice?
Open space to answer
2- Are you currently retired?
Yes/No
3- What is your current occupation?
Open space to fill
Not applicable

4- Did you have an alternative career or profession before becoming a veterinarian?
Yes/No
3a- If applicable, to what extent do you agree with the following:
Having an alternative career or profession before becoming a veterinarian influenced my decision into leaving clinical practice
Y/N or NA

5- What area of clinical practice did you work? (please tick all that apply)
Multiple choice
- Small Animal Clinical Practice
- Mixed Animal Practice
- Production Animal Practice
- Equine practice
- Specialist practice
- Wildlife, Exotic Pets, Laboratory or Zoo Animal Practice
- Animal Shelter Practice
- Prefer not to say
- Other – Please Specify

5a – Out of those in which area did you spend most of your working time as a clinician?

6- To what capacity did you work as a veterinary clinician? (please tick all that apply)
Multiple choice
- I was a veterinary associate
- I was a locum/casual veterinarian
- I was a practice owner/employer
- Prefer not to say
- Other. Please specify

7- In which state did you work the most as a veterinary clinician?
Multiple choice
- South Australia
- Victoria
- Tasmania
- New South Wales
- Queensland
- Northern Territory
- Western Australia
- Prefer not to say

8- In what region(s) did you work as a veterinary clinician? (please tick all that apply)
Multiple choice
- Metropolitan (>100 000 population)
- Semi – rural (10 000 – 100 000 population)
- Rural (< 10 000 population)

9- How many hours on average do you work per week as a veterinary clinician?
Continuous analogue from 10->60+

10- Did you have any ‘on call’ duties before you left clinical practice?
Yes/No
Prefer not to say

11- How much did you earn per annum gross as a veterinary clinician before you left practice?
Continuous analogue from 1-300+
Prefer not to say

12- Have you had a complaint made against you to a regulatory authority such as the veterinary surgeons board?

Multiple choice

- Never
- Once
- More than once
- Prefer not to say

Thank you very much for your time in completing this survey
Please see the following numbers if you are feeling distressed

SURVEY B

Alternative career interest and intention to leave

1- Did you have an alternative career or profession before becoming a veterinarian?
Yes/No
2- Are you intending to leave veterinary clinical practice in the next:
Multiple choice
12 months
24 months
3 years
I am not intending to leave clinical practice in the foreseeable future

General questions:

1- What area of clinical practice do you currently work? (please tick all that apply)
Multiple choice
- Small Animal Clinical Practice
- Mixed Animal Practice
- Production Animal Practice
- Equine practice
- Specialist practice
- Wildlife, Exotic Pets, Laboratory or Zoo Animal Practice
- Animal Shelter Practice
- Other – Please Specify

6a - Out of those in which area do you spend most of your working time as a clinician?
6b - To what capacity do you work as a veterinary clinician? (please tick all that apply)
Multiple choice
- I am a full time veterinarian
- I am a part time veterinary veterinarian
- I am a locum/casual veterinarian
- I am a practice owner/employer
- Prefer not to say
- Other. Please specify
Open space for answer

2- In which state do you work the most as a veterinary clinician?
Multiple choice
- South Australia
- Victoria

- Tasmania
- New South Wales
- Queensland
- Northern Territory
- Western Australia
- Prefer not to say

3- In what region do you currently work? (please tick all that apply)
Multiple choice
    - Metropolitan (>100 000 population)
    - Semi – rural (10 000 – 100 000 population)
    - Rural (< 10 000 population)

4- How much do you earn per annum gross as a veterinary clinician?
Continuous analogue from 1-300+
Prefer not to say answer

5- How many hours on average do you work per week as a veterinary clinician?
Continuous analogue from 10->60+

6- Do you have any 'on call duties?
Yes/No

7- Have you had a complaint made against you to a regulatory authority such as the veterinary surgeons board?
Multiple choice
- Never
- Once
- More than once
- Prefer not to say

Thank you very much for your time in completing this survey
Please see the following numbers if you are feeling distressed

Chapter 5: Moral and ethical conflict and moral distress in veterinarians. A mixed-methods approach

Summary

The results from chapter 4 show important demographic and work-related factors associated with attrition from clinical practice. However, moral distress and other psychological variables are yet to be evaluated. The studies were separated since over 100 respondents did not answer the psychological measures but did answer the demographic and working conditions questions. To prevent losing important demographic and working conditions data, it was decided to perform two analyses. In the literature, validated psychometric tools to measure variables such as motivations to be a veterinarian and professional quality of life can be found. However, no scale to measure moral distress in these professionals has been developed. Scales to measure moral distress in other professionals are available but may not adequately capture the moral distress experience of veterinary clinicians. Furthermore, the theoretical moral distress pathway presented in chapter 2 is yet to be evaluated. Chapter 5 explores moral distress in veterinarians in more depth. Initially, the moral deliberation pathway presented in chapter 2 is assessed in a group of former veterinary clinicians. Then, a moral distress scale is developed for veterinary clinicians. Finally, additional moral and ethical conflicts experienced in veterinary clinical practice are described.

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ii. permission is granted for the candidate in include the publication in the thesis; and
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Moral and ethical conflict and moral distress in veterinarians. A mixed-methods approach

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Abstract

Moral distress is defined as the psychological anguish a person can experience when confronted with a situation perceived to conflict with their personal values (moral conflicts). Veterinary professionals are often confronted with moral and ethical conflicts from which they can develop moral distress. Using a mixed-methods approach, this chapter investigates the moral deliberation pathway, sources of moral conflict, and measurement of moral distress in clinical settings. A mixed-methods approach was chosen to detail the pathway that veterinarians undertake when they experience a moral conflict. As well as to inform additional questions necessary to contextualise a moral distress measure designed for medical professionals to the veterinary context and capture additional sources of moral conflict in veterinary clinical practice.

The results of the qualitative study suggest that veterinarians follow a similar deliberation process to medical professionals: experiencing a moral conflict leads to stress (moral stress) then either to psychological anguish (moral distress) or resolution into moral comfort. This deliberation process was empirically explored in veterinary clinicians. The second study adapts a moral distress scale used for medical professionals and contextualises it to veterinary clinical practice. The measure contains three sub-scales: 1) Team communications that

compromise patient care, 2) Conflicting client interactions, and 3) Situations perceived as a personal threat. This study contributes empirical evidence supporting a previously proposed moral deliberation pathway in veterinarians; identifies additional moral conflicts in veterinary clinical practice highlighting the need for a moral distress measure contextualised to veterinary clinical practice; and develops a tool to measure veterinary clinicians' moral distress. Measuring moral distress allows identification of this issue in practice, which can inform intervention strategies to mitigate the deleterious effects of moral distress in veterinarians.

Introduction

Moral distress (MD) elicited from experiences of moral conflict has been reported in veterinarians and other healthcare professionals. A moral conflict is defined as a situation that conflicts with a professional's morals, and an ethical conflict (also known as an ethical dilemma or moral challenge) is a situation where the correct course of action is unclear[1-3]. The stress associated with the perceived moral conflict has been referred to as moral stress[1,4,5], where the situation causes an adverse negative emotion, but it is transient[1]. There are two possible outcomes of a moral conflict: moral comfort and growth (if the conflict is resolved to the professional's satisfaction) or moral distress[1,6,7]. Moral distress is defined as the psychological disequilibrium and emotional anguish a person can experience when exposed to a moral conflict and are unable to follow what they perceive to be the correct moral path[8-10].

Moral distress theories have been developed in medical professionals[7,11,12]. Corley's theory in medical nurses proposes that influential factors like strength of patient advocacy (how much they advocate for their patients) shape how a morally conflicting situation is perceived and the level of competency in ethical decision making, as well as working conditions (e.g. workload), influence the path towards moral comfort or distress[7]. Once a situation arises that challenges the nurse's values, the nurse takes one of two pathways. The first pathway leads to action, where the nurse is willing to take a stand, for example by challenging the institution (potentially jeopardising their job), and reach moral comfort[13]. The second path leads to moral distress. When MD occurs, the negative impacts affect the nurse themselves, the patients, and the organisation[7]. A literature review of moral distress in veterinarians suggests that veterinarians might undergo similar experiences[1]. Influential factors can also impact how moral distress develops. For example, factors such as perfectionism as a personality trait can influence the negative effect of moral distress experienced in veterinarians[14]. Also, individual perceptions of animal value and human-animal bond were identified as influential forces in decision making in situations of ethical or moral dilemmas in veterinarians[15]. Furthermore, the veterinarian can then act according to their perceived moral obligations[15] and experience moral comfort instead of MD. Although the implications of MD in patients and organisations in veterinary practice are less explored, the stress and negative emotional impact of MD in veterinarians has been documented[2,4,5,15-18]. Moral distress has been associated with depression[19], burnout[7], compromised patient care[7] and increased intention to leave the workplace in healthcare professionals[6,19-23], and occupational stress in veterinarians[4,14,16,18,24]. It is important to understand how MD develops in veterinarians to develop evidence-based intervention strategies that mitigate its deleterious effects. Previous studies in veterinary practice have described veterinarians' ethical justifications in the presence of ethical or moral conflict[15,25], documented possible influential factors for moral distress[14,15], listed situations perceived as moral conflicts[5,18,24,26], and reported the deleterious effect of moral stress and distress[4,16-18,24]. However, the pathway from moral conflict to moral distress in veterinary clinicians has not been explored in detail. Furthermore, the

frequency and degree of distress of these experiences are yet to be measured using a validated scale in veterinarians.

Moral distress has been measured in healthcare professionals, using validated psychometric scales[19,27,28]. Moral distress scales in healthcare professionals measure the frequency and stressfulness of MD and associated moral conflicts. Reported moral conflicts in healthcare include the inability to ensure informed consent from patients, the inability to speak up to report breaches of codes of ethics, and struggles with futile care and treatments[12,23,28,48]. Similar scenarios occur in veterinary practice; although, veterinarians encounter additional situations that can lead to MD. For example, moral conflicts with patient euthanasia and costs of veterinary care are common in veterinary practice[4,5,17,18,26,29] and may not be accurately captured in a moral distress scale for healthcare professionals. Other moral and ethical conflicts in veterinary practice include destruction of livestock during biosecurity crisis[30]; clients wishing to continue treatment despite poor animal welfare or quality of life[24-26]; having conflicting clinical views from colleagues[2,14,18,26]; and depending on local legislation, surgical procedures that are perceived to have no benefit for the animal patient such as de-clawing[2,31]. Such differences stem from the inherent conflict when veterinarians are called to meet the needs of their animal patients, their clients and society at the same time[2,32]. However, the exploration of moral (or ethical) conflict previously conducted in veterinarians has been qualitative research in smaller cohorts (less than 100)[18,26] or has focused quantitatively on the impact of the conflict in larger samples[24]. It is possible that moral conflicts which have not been previously reported could arise if a free-text option is distributed to a large group of veterinarians. Experiencing moral conflicts can lead to the negative impacts of moral distress. The documentation of moral conflicts associated with veterinary practice not described in moral distress scales developed for medical professionals highlights the need for a contextualised measure of MD in veterinary practice.

To better understand MD in veterinarians, an explanation of the process of moral distress as well as a scale to measure moral distress is needed. Measuring MD informs the development of intervention strategies in the workplace to mitigate the negative effects of moral distress. Measuring MD is also needed to empirically assess the relationship between moral distress and other occupational factors such as staff retention and job satisfaction. In this study we intend to assess via in-depth qualitative exploration whether the moral deliberation model previously proposed for veterinary clinicians in a recent review of the literature[1] (which is based on Corley's moral distress theory for medical nurses[7]) applies in the veterinary context. This analysis informs the development of an MD measure contextualised for veterinary practice. Finally, with a qualitative analysis of free-text answers to an extension question about other elements contributing to moral and ethical conflict[33] in a large cohort of veterinarians, we intend to capture any other possible sources of moral conflict not discussed previously. The objectives of this study are threefold:

1) To assess whether the moral deliberation pathway in clinical veterinarians follows the theory and model proposed by Corley in medical nurses.
2) To develop a moral distress scale to measure this phenomenon in clinical veterinarians.
3) To report any additional moral conflicts experienced in veterinary clinical practice.

Methods

This study used a mixed-methods approach. Firstly, qualitative methods with thematic analysis was used to identify common themes from interviews of a cohort of former veterinary clinicians regarding their experience with moral and ethical conflict (Study 1). The second study (Study 2) is both quantitative and qualitative. A moral distress measure was constructed using factor analysis of veterinary specific survey items added to a validated moral distress scale for medical professionals[28]. Free text responses were also analysed to capture other moral and ethical conflict sources in both current and former veterinary clinicians. Both studies received human ethics approval (H-2017-229).

A mixed-methods approach was chosen to enable a contextualised exploration of individual experiences with moral distress evolving from a moral conflict in veterinary clincians[34-36]. This deep exploration surrounding the context of individual experiences with moral conflict and MD informed the adaptation of a moral distress survey to veterinary settings to improve its accuracy and relevance[37]. Items contextualised to veterinary settings were added to a previously validated measure of MD for medical professionals based on the results of Study 1 and review of the veterinary literature. Exploratory and confirmatory factor analyses were used to develop a psychometric tool to measure moral distress in veterinarians. Finally, thematic analysis of free text answers was used to capture any other moral or ethical conflicts that might not have been described previously.

Study 1

Methods

30 former veterinary clinicians were interviewed regarding their experiences in clinical practice, including moral and ethical conflict and the possible development of moral distress. This was performed as part of a larger study investigating reasons for attrition in veterinary clinical practice[38]. The responses regarding moral conflict and associated stress were analysed further using thematic analysis[36,39] to assess whether the experiences veterinarians had when exposed to a moral conflict were reflected in an adapted moral deliberation pathway model[1] based on a moral distress theory for medical nurses[7]. Both Corley's MD theory for medical nurses and the proposed moral deliberation pathway in veterinarians establish that influential factors (such as personality and personal values) shape whether a situation is perceived as a moral conflict or not. Following the encounter of a moral conflict, the veterinarian experiences stress associated with the situation, which is referred to as moral

stress. The model and theory present two possible outcomes: moral comfort when the professional finds an acceptable resolution to the moral conflict, or moral distress when the situation generates emotional anguish[1,7]. The path from moral conflict to outcome has been referred to as the moral deliberation pathway[1].

Participants were recruited via social media platforms and through alumni offices of four of seven Australian universities offering veterinary science programs. All interviews were completed between February and April 2018. Analysis was completed using NVivo 12®, and 12% of the interviews were selected for member checking. An Inter-coder agreement was performed by two authors (AAM and SMM) resulting in 74% pre-discussion agreement and 99% post-discussion agreement[40]. For the 1% of codes that the two researchers disagreed on, the coding criteria of the primary researcher prevailed on the basis that the primary researcher (who was also the interviewer) was more immersed in the data. The analysis of the interviews informed the development of the survey used in Study 2 by providing some of the additional items to be included in the adaptation of a MD scale validated for medical professionals[28] to the veterinary clinical setting.

Results

All interviews of former veterinary clinicians (n=30) addressed whether the participant had experienced moral or ethical conflict during their working life. Some participants organically (without any prompting from the interviewer) discussed 'ethical' or 'moral' issues that triggered an emotional response. Others were asked if they experienced any challenging 'ethical' or 'moral' issues or 'conflicts with their values' and how they responded to those. Of the 30, 20 had experienced moral or ethical conflict. They were asked to describe the situation further and their moral deliberation process. The themes that emerged from the deliberation process were: Influential Factors, Moral and Ethical Conflict, Moral and Ethical Stress, and Moral Distress. The codebook and examples of quotes are provided in Table 1.

Influential Factors refers to personal characteristics associated with the perception of moral and ethical conflict and influence how each part of the moral deliberation pathway is experienced. Influential factors discussed by participants included their perception of animal value, their upbringing, and intrinsic motivations and beliefs. Moral and Ethical Conflict occurs when a situation or situations are perceived to be: a conflict of interest between themselves and another person (e.g. client, colleague); conflicting with their morals and values, or an ethical dilemma where the perceived correct course of action is unclear. Whether a situation was perceived as a conflict by the participants was often driven by their influential factors. For example, Participant 25 explains their love and care for animals in the following quote, which then influences how a situation is perceived to go against such care resulting in moral conflict:

It was the love of animals, (…) I felt very responsible for them (…) because the farmers' decisions are all financial and even sometimes when treating their dogs, it became a financial decision (…) from my own personal values and morals, I would say (…) I still see it as an animal has a right to a good life. [P25]

In the example above, the participant values being responsible for providing a good life for animals because they perceived animals to have a right to a good life. The conflict arises when the farmer's decision is more financial, at the expense of the animal's right to a good life. Table 1 provides further examples of moral conflicts described by participants in the study. Some participants developed moral stress from a situation that was perceived as a moral or ethical conflict. Participants used comments such as: 'didn't like', 'it was hard' or 'found stressful' or 'challenging'. When this was perceived to be manageable and transient for the participant, it was considered moral stress instead of moral distress[41]. For example, P5 mentioned:

Another aspect of the job was welfare cases as well, and so that was pretty challenging [P5]

The next step in the participants' experience was either developing moral distress (emotional anguish and psychological distress)[10] or finding a resolution to the moral or ethical conflict[6,7]. Participant 6 below provided an example of moral distress, whereas Participant 11 showed an example of resolution leading to moral comfort.

(…) I'd be feeling it, and I'd be replaying those scenarios and experiencing those emotions. I might be angry or resentful or feeling guilty because I had to euthanise animals because the owner didn't have the money. I would be carrying the guilt. [P6]

(…) there's some things that I can compartmentalise, like just go, "Well, it's the owner's call. It's their animal." That they're the ultimate people that have to make that decision, not me. I'm comfortable with that. That's okay. [P11]

Overall, the results from Study 1 support the moral deliberation pathway proposed for veterinary clinical practice in Arbe Montoya *et al.*[1] This model is based on the moral distress theory for medical nurses developed by Corley[7]. Although Study 1 identified situations that lead to moral and ethical conflicts, these were not explored in depth. Study 2 focuses on situations encountered in clinical practice that are perceived as sources of moral and ethical conflict. The moral conflicts in Study 1 were included as additional items when creating the moral distress scale for veterinary clinicians used in Study 2.

Table 1: Facets of The Moral Deliberation Process

This table describes the themes associated with moral distress and the moral deliberation path that the participants of Study 1 presented, along with sample quotes to illustrate each theme.

Name	Description
Influential factors	Factors that influenced the participants' experience of moral or ethical conflict. P1: *I cared about the people I guess more than anything (…)* P6: *Every opportunity, my preference was to go out and find the animals and be with them. I don't know where that's come from. It just seems to be an innate thing to me*… P13: *I suppose partly my background, coming from a family that we have to be very conscious about money and the stresses around it. I think there's a problem with the system but also* [with] *me in the system… I was too empathetic almost with those situations.*
Moral and ethical conflict	Situations that generated either a conflict with the participant's personal values or a conflict with their perceived professional ethics. P6: *(…) having to go ahead and do a treatment that wasn't optimal for the animal because the owner couldn't afford it, or the owner just didn't care enough in some cases.* P9: *If I was aware of colleagues acting unethically* [*that affected me*…] P13: …*That one with the cat with the broken hip that just needed cage rest, that was a big ethical dilemma in a way.* P7: *If I had euthanized something that didn't need to be euthanized, like the kittens with cat flu or some dog with behaviour issues… something like that.* P5: *(...) it's sort of professional suicide I supposed if you went around sort of pointing out all the welfare issues and things in animals.*
Moral stress	Stress and accompanying negative emotions and thoughts elicited from exposure to moral or ethical conflict. P25: *I found that really hard.* […*I felt like I was over servicing*…] P14: *I felt bad. I felt really bad and I did feel responsible.* P21: *You know what the right thing is. It's just when do you pull the stops out and say to people, "You know what you're wanting me to do is unacceptable." I find that possibility of conflict quite stressful.*
Moral distress	Psychological anguish and emotional distress stemming from moral or ethical conflicts. P1: *I think it just got to a point where I felt terrible as a human being (…)*

	P6: *I was stuck in the middle having to carry, take on their anger and their guilt. I would be feeling for them, and for the animal, and taking all of that on myself which was a huge emotional burden to bear. That was my other really big challenge that ultimately led me to just feeling emotionally burned out, getting to the point where you feel like you can't feel anymore.* P7: *I had to euthanize a number of kittens and that still upsets me. I still think about it. I still see it my head… they really took a toll.*

Study 2

Methods

A survey was created and distributed to current and former veterinary clinicians. Surveys were distributed by veterinary groups on social media platforms and disseminated through alumni offices of six of seven Australian universities that have veterinary science programs. The survey was open between November 2019 and February 2020. The survey explored aspects of veterinary professional life to acquire data for a larger study and included a section on moral distress, which is analysed in this study along with demographics. Demographic data included gender, field of work, region of work, age and years of experience.

Survey

Moral distress was explored using items from a 27-item validated scale developed in healthcare professionals[28]. The Measure of Moral Distress for Healthcare Professionals (MMD-HP) represents the most current measure of moral distress for healthcare professionals. It was theorised that if veterinarians undergo a similar moral deliberation process as medical nurses, a validated MD scale for healthcare professionals might also apply to veterinarians. The MMD-HP had four factors that explained the root causes of moral distress in medical professionals. The MMD-HP factors were: 1) conflicts with the workplace primary systems (System) with eight items, 2) clinical conflicts at the patient level (Patient) with six items, 3) compromised team integrity perceived as a personal threat (Personal Threat) with seven items, and 4) breakdown in team interactions with a patient or the patient's family (Team communication) with six items.

The scale comprised two questions per item to evaluate both the frequency of the moral conflict and its associated distress. The scale asks per item: *In relation to the following situations: How often does this occur?* and *How distressing do you find it?* For example, question 1 of the MMD-HP states: '*Witness healthcare providers giving "false hope" to a patient or family'.* The respondent is asked how frequently this situation occurs and how distressing they found it. A final score per item is calculated by multiplying the results of the two questions as per the MMD-HP design[28]. Although the original measure uses a 5-point Likert scale from 0 (never/not distressing) to 4 (very frequently/very distressing), it was an ethics committee suggestion by The

University of Adelaide for this survey to include a 'not applicable' option. Therefore, the adapted measure used for this study ranged from 0 (not applicable) and 1 (never/not distressing) to 4 (very frequently/very distressing). Some of the items of the original measure were re-worded to align with a veterinary context. For the example above, the item was re-worded to *'Witness veterinarians give 'false hope' to a client regarding a patient.*

Study 1 and the related veterinary literature revealed additional moral conflicts that the MMD-HP does not capture; therefore, adapting the scale for the veterinary context was necessary. The MMD-HP does not include moral conflicts previously associated with MD in veterinarians, recurrent moral conflicts discussed in literature, and those conflicts mentioned by participants from Study 1. Thus, eight items were added to further contextualise the measure for the veterinary profession. The veterinary specific items added to the scale were:

1- Performing euthanasia in general.
2- Performing euthanasia for reasons I do not agree with.
3- Suspecting patient abuse or animal cruelty.
4- Being unable to provide optimal care due to pressures from clients to reduce costs.
5- Working in a situation where the client would not pay for the recommended treatment.
6- Participating in care and procedures I do not agree with but doing so because of fear of being fired.
7- Carrying out the client's wishes that were not in the best interest of the patient.
8- Assisting other veterinarians who were providing incompetent care.

The total score used for analysis tallies the score of all the items from the MMD-HP and the added veterinary specific items, a total of thirty-five items. The moral distress component of the survey is provided in the supplementary materials.

The final step of the survey in Study 2 used a qualitative thematic analysis on the open-ended question responses asking respondents to identify any other situations perceived to cause moral or ethical conflict. This step was done to capture possible themes and conflicts in a large cohort of veterinarians that might not have been previously described in the literature. This question was worded as: *Thinking back to your time as a veterinary clinician, were there any other elements that you considered to cause moral or ethical conflict? (please specify)*. In the question, 'other elements' refers to the items of the MMD-HP and the veterinary items added. This provided a contextual framing for the open-ended question[33]. Specific definitions of moral and ethical conflict were not provided to avoid leading the respondents towards pre-determined definitions and to allow their interpretations of moral or ethical conflict to come to light.

Data analysis

Two analyses were performed to develop a scale to measure moral distress. The quantitative part of the project was completed using SPSS Statistics® (V.26).

The total responses (*n* = 643) were randomly divided into two groups of approximately 50% partition using the randomised case selection of SPSS. An exploratory analysis using principal component analysis (PCA) was completed with one of those groups (Group A, *n* = 325). PCA was chosen since simple and psychometrically sound factor extraction was all that was needed[43]. PCA also captures maximum variation and avoids some potential problems with factor indeterminacy[42,43]. The program uses listwise exclusions and the PCA was performed on 325 complete answers. A Cronbach's alpha of 0.7 or above was considered acceptable for emerging factors[44]. However, only items with factors at a loading of 0.55 (rounded from 0.548) or above were kept in the exploratory analysis, since it was found that these provided the best model fit in the confirmatory factor analysis. The second step was to perform a confirmatory factor analysis (CFA) using SPSS® Amos 26 using the default estimation method of Maximum Likelihood. The CFA was completed on Group B (*n* = 318). The pilot scale underwent confirmatory factor analysis using SPSS® Amos to assess the model's goodness of fit. Goodness of fit with the current sample size was established by achieving the following fit indices: Relative to degrees of freedom chi-square (X^2/df) with a cut off value of <2 to 5; Goodness of fit index (GFI) with a cut off value of >0.9; Root mean square error of approximation (RMSEA) with a cut off value of 0.07 to 0.09 and the Tucker-Lewis Index (TLI) with a cut off value of >0.9[66].

Finally, the free-text answers were analysed using thematic analysis, where the principal researcher (AAM) did the initial coding. The codebook and structure of themes and sub-themes were reviewed iteratively by two authors (AAM and SMM). Inter-coder agreement was established by independently coding 10% of the answers, which yielded a 74% pre-discussion agreement and a 98% post-discussion agreement[40]. As per in Study 1, for the 2% of codes that the two researchers disagreed on, the coding criteria of the primary researcher prevailed on the basis that the primary researcher was more immersed in the data.

Results

Description of the sample

The survey had a total of 920 responses. However, only the 643 participants who completed the quantitative moral distress survey were used for the factor analysis. Of the respondents, 420 (65.3%) were female and 221 were male (34.4%), one identified as other and one answered as 'preferred not to say' (0.3%). There were 425 (66.1%) small animal clinicians, 161 (25%) mixed animal, production animal, and equine practitioners, 54 (8.4%) worked in other fields like specialist practice and wildlife care, and three did not answer. A total of 227 (35.3%) were no longer working in clinical practice, and the remaining 416 (64.7%) were still working as clinicians. The

average age of the participants was 46 years of age, and the average years since graduation was 17 years (Table 2). Three hundred and eleven participants responded to the text question at the end of the survey: *Thinking back to your time as a veterinary clinician, were there any other elements that you considered to cause moral or ethical conflict? (please specify),* however, 49 of them answered 'no' or their response was unrelated to the question. Out of the 261 respondents who provided codable responses to the free text question, 177 (67.6%) were female, 84 (32.1%) were male, and one identified as other. In regards to field of work, 174 (66.4%) had worked with small animals only, whereas the rest had worked in mixed animal practice and other fields, and 91 (34.7%) had stopped working in clinical practice at the time of the survey.

Table 2: Description of the sample

Variable	**Categorical Variables**	
	n	%
Currently still working in clinical practice		
Yes	416	64.7%
No	227	35.3%
Region of work		
Metropolitan only	341	53.2%
Semi-rural and rural	270	42.1%
Both	30	4.7%
Gender		
Female	420	65.3%
Male	221	34.4%
Other/Prefer not to say	2	0.3%
Field of work		
Small animal only; Mix, equine and production animal; other	425 161 54	66.1% 25% 8.4%

	Continuous variables		
	n	Mean (range)	Standard deviation
Age	640	45.91 (23-88)	+- 15.06
Experience	641	16.7 (<1 – 60)	+- 13.93

Principal component analysis (PCA)

Based on the scree plot and subsequent parallel analysis comparing eigenvalues, three factors were retained from the initial exploratory factor analysis[43]. Sixteen items were identified in the exploratory factor analysis as loading adequately onto these factors (>0.55 factor loading). These 16 items were analysed using both a direct oblimin and a varimax oblique rotation forced to the three factors. Since these methods yielded similar results, only the results of the varimax rotation are reported here[43]. Only those items that loaded on a single factor (factor loading > 0.55) and were conceptually different from each other were kept in the final scale. A factor loading cut off of >0.55 (rounded up from 0.548) was used since using a lower cut off point previously yielded an inadequate goodness of fit in the confirmatory factor analysis model. The three factors ascertained from the PCA represent possible root causes of moral distress in veterinary clinical practice. Factor 1 (Team relations that compromise patient or client care) has 6 items and represents situations where adverse team relations and communication compromise patient and client care. Factor 2 (Conflicting client interactions) also has 6 items and represents situations where there are conflicting interests between client and patient needs. Factor 3 (Situations perceived as personal threat) has 4 items and represents situations where the professional perceives a personal threat. Table 3 displays the results of the exploratory principal component analysis as the pilot scale.

Confirmatory factor analysis (CFA)

A Confirmatory factor analysis (CFA) was then performed on the pilot scale. Goodness of fit indices for the analysis are shown in Table 4. The model had a RMSEA value of 0.08, indicating low indices of significant error. The relative chi square (X^2/df) and the TLI and CFI indices met the cut off criteria indicating an adequate model fit. The model is provided in Figure 1. The final moral distress scale for veterinarians (MDS-V) was confirmed as a three-factor scale with 16 items (Table 3). The scale uses a 0-4 Likert scale (from never/not distressing to very frequently/very distressing with ‘not applicable’ as 0). Each item was measured by multiplying the frequency of the moral conflict occurring (*‘How often does this occur?’*) and distress elicited (‘*How distressing do you find it?’*) to create a single score per item ranging from 0-16[28]. A total moral distress score was then calculated by adding all the items together for a score ranging from 0-256.

Table 3: Moral Distress Scale for Veterinarians (MDS-V)
Items and factors, with item’s source of origin, factor loading scores and Cronbach’s Alpha score per factor.

Item	Item origin	Factor 1 *Team relations that compromise patient or client care*	Factor 2 *Conflicting client interactions*	Factor 3 *Situations perceived as personal threat*
1. Participate on a team that gives inconsistent messages to clients	MMD-HP – Team communication affecting patient care	0.731		
2. Experiencing lack of administrative action or support for a problem that is compromising patient and/or client care	MMD-HP – System	0.665		
3. Working within power hierarchies in teams, units and in my practice (or institution) that compromise patient and/or client care	MMD-HP – Personal threat	0.658		
4. Witnessing low quality of patient and client care due to poor team communication	MMD-HP – Team communication affecting patient care	0.621		
5. Being required to care for patients who have inconsistent or unclear treatment plans or who lack goals of care	MMD-HP – Team communication affecting patient care	0.621		
6. Assisting other veterinarians who were providing incompetent care	Veterinary specific added item	0.576		
7. Working in a situation where the client would not pay for the recommended treatment	Veterinary specific added item		0.772	
8. Being unable to provide optimal care due to pressures from clients to reduce costs	Veterinary specific added item		0.741	
9. Carrying out the client's wishes that were not in the best interest of the patient	Veterinary specific added item		0.707	
10. Performing euthanasia for reasons I do not agree with	Veterinary specific added item		0.655	
11. Being required to work with abusive clients†	MMD-HP – System		0.617	
12. Continue providing aggressive treatment to a patient who is most likely to die regardless of this treatment	MMD-HP – Patients		0.548	
13. Participate in care and procedures I do not agree with, but doing so because of fears of being fired	Veterinary specific added item			0.677
14. Witness a violation of standard of practice or code of ethics and do not feel sufficiently supported to report the violation	MMD-HP – Personal threat			0.644
15. Feel the pressure to order or carry out orders for what I consider to be unnecessary or inappropriate tests and treatments	MMD-HP – Patients			0.638
16. Participate in care and procedures I do not agree with, but doing so because of fears of litigation or complaints	MMD-HP – Personal threat			0.569
Sub-Scale Cronbach's Alpha		*0.849*	*0.835*	*0.768*

Figure 1 Confirmatory factor analysis

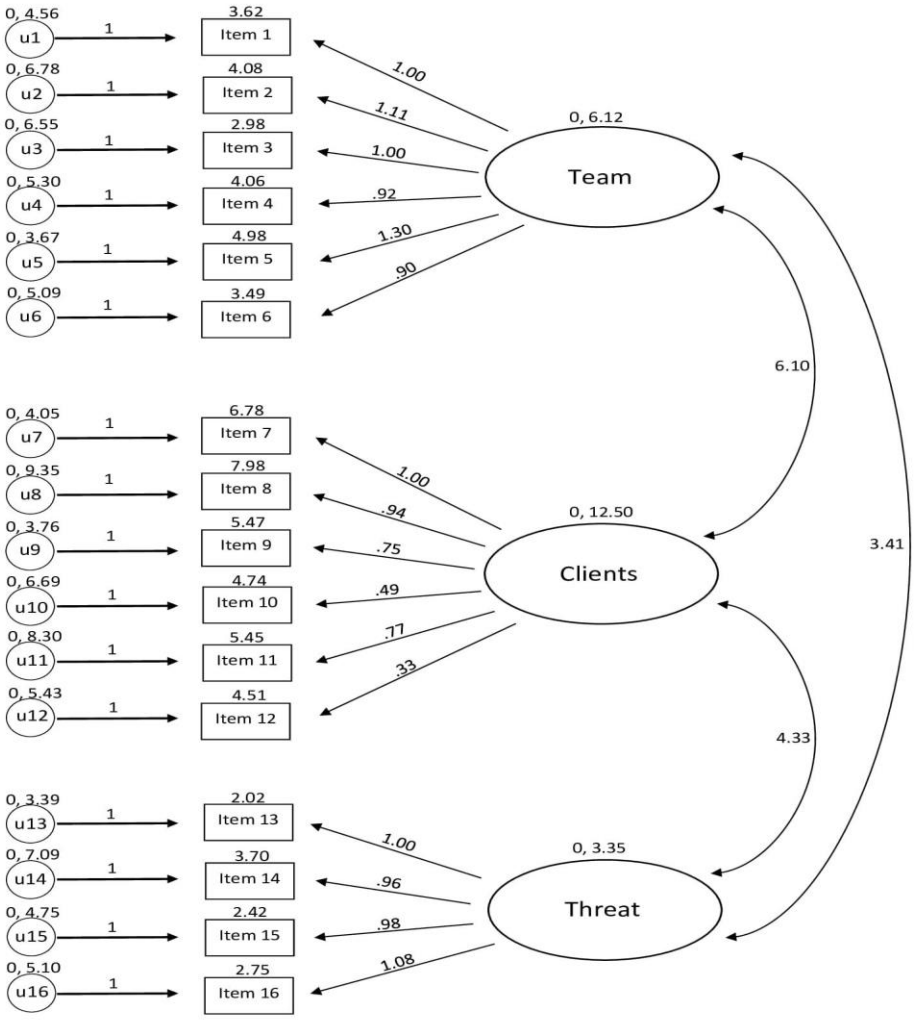

Table 4 Model Goodness of Fit for Confirmatory Factor Analysis
Indices of goodness of fit for confirmatory factor analysis of the Moral Distress Scale for Veterinarians (MDS-V)

Model	χ^2	df	p	χ^2/df	TLI	CFI	$RMSEA$ (90% CI)
Three factor components	287.75	101	< 0.001	2.85	0.91	0.92	$0.08\ (0.07, 0.09)$

Analysis of free-text responses in survey

Two themes emerged from the data: Animal Health and Human Interactions. In Animal Health, the respondents' perceptions related to conflicts where the health of and care for the animals were not prioritised. This theme has five sub-themes: Clinical care, Clients, Colleagues, Euthanasia and Systems. In Human Interactions, respondents described conflicting situations unrelated to animal patients but rather interactions with other people. This theme has six sub-themes: Negative colleague interactions, Client care and interactions, Financial gain, Employment conditions, Personal threat and Regulations. Furthermore, respondents often described situations that represented interactions between the two themes. The codebook for this analysis, with themes, sub-themes and illustrative quotes, is shown in Table 5.

Animal Health relates directly to the effect of a situation on the animal patient and contains five sub-themes. Below are definitions of each sub-theme and sample quotes:

1) Clinical care: conflict arose from the veterinarians' inability to provide the desired clinical care. This includes treating animals with genetic deformities or pressure to provide diagnostics, treatments or procedures they considered unnecessary or unbeneficial to the patient.

   C322: *Was told it was compulsory to give every animal an injection of steroids and antibiotics.*

2) Clients: the respondents explained the conflicts arising from clients failing to facilitate or provide desired patient care, including inability or unwillingness to pay for treatment, not following treatment recommendations, animal cruelty or neglect, and breeding animals for commercial gain.

   C411: *Not having the ability to make a difference with clients who neglect their animals.*

3) Colleagues: situations where the respondent's colleagues or other veterinary team members failed to provide the desired patient care.

   C636: *(…) watching other vets provide substandard or outdated care despite evidence this is no longer acceptable.*

4) Euthanasia: situations specifically related to the undesired euthanasia of animals.

C732: *healthy animals with a good chance of finding a new home, euthanasia at owners' insistence.*

5) System: situations where systematic flaws in the clinic or the industry hindered the ability to provide the desired patient care, including lack of resources, staff training, and industry or practice protocols disagreeable to the respondent.

   C442: *Supporting animal production systems that do not take animal welfare considerations into account sufficiently.*

The second theme, Human Interactions, focuses on interpersonal relationships rather than the animal patient. These include interactions with the veterinarian and the veterinary team as well as the public and clients. Human interactions contains the six sub-themes described below, each with sample quotes.

1) Negative colleague interactions: situations where moral and ethical conflict was related to interpersonal relationships with colleagues not involving animal patients. Respondents mentioned colleagues' abuse to persons other than themselves, employers and support staff, and lack of support from employers.

   C811: *not receiving adequate support from my employer.*

2) Client care and interactions: interactions and conflicts limited to the veterinarians' ability to care for their clients, including the impact of the cost of veterinary care on the client, client expectations for service, client welfare, and unethical client actions. These conflicts do not involve a perception of personal threat to the veterinarian.

   C863: *Doing expensive diagnostics for clients who really couldn't afford them but paid anyway.*

3) Financial gain: conflicts arising from pressure to increase financial gain, including revenue generation and over-servicing clients.

   C836: *Upselling products/services that are unnecessary (…)*

4) Employment conditions: moral and ethical conflicts arising from working conditions perceived by the respondent as unjust or immoral.

   C545: *(…) on call 24/7 with no additional remuneration for extra hours worked.*

5) Personal threat: situations where the respondent perceives a direct threat to themselves, including abuse and bullying, where they are unable to speak up.

   Case 420: *not feeling able to speak up.*

6) Regulations: situations involving conflict with regulations, legislation or regulatory authorities.

   C300: *Being forced to perform procedures that were against the rules of horse racing.*

Table 5: Moral and Ethical Conflict. Analysis of Free Text Answers

Question that generated free text responses: *Thinking back to your time as a veterinary clinician, were there any other elements that you considered to cause moral or ethical conflict? (please specify)*.
Themes and sub-themes with associated descriptions and illustrative quotes

Name	Description and sample statements
Animal health	Conflicts where animal health is not being prioritized
1 Clinical care	Conflicts arising from the veterinarian themselves failing to provide desired clinical care, including treatment, diagnostics and avoiding breeding animals with genetic defects Case 305: *(…) giving puppies a multi vitamin injection with no scientifically justifiable reason* Case 389: *(…) we did not use sufficient analgesia for patients (…)* Case 542: *Palliative care which is not in the best interest of the patient* Case 635: (…) *when diagnosis for a patient was made too quickly, or other possible causes of illness were not considered* Case 272: *Working in canine reproduction - elective caesarians on "designer" breeds*
2 Clients	Conflicts arising from clients failing to facilitate or provide desired patient care, including inability or unwillingness to pay for treatment, not following treatment recommendations, animal cruelty or neglect, and breeding animals for commercial gain Case 284: *Working with animal welfare groups who weren't prepared to support optimal care, who sometimes treated the animals in their care poorly*

	Case 525: *The main one being when clients are unwilling or unable to pay for appropriate care/treatment of their animal* Case 765: *Skull smashed in by owner repeatedly thrashing its head against the ground. Causing brain herniation and eventual death* Case 585: [Clients] *who feel they have a right to own a pet but can't afford even basic care* Case 701: *Servicing breeders, particularly backyard, guard dogs and greyhound breeders*
3 Colleagues	Conflicts arising from colleagues or other veterinary team members failing to provide desired patient care Case 264: *Primarily when I felt other vets were not providing the appropriate standard of care* Case 654: *Vets who are dangerous to animals, e.g. using dangerous anaesthetic protocol* Case 292: *Main issue was compromised patient care from other staff members not doing their jobs properly – laziness* Case 644: (…) *patients who had been seriously mismanaged by their referring vet* Case 839: *The reluctance of new graduates to try anything out of their comfort zone, e.g. refusing to treat a bird, and only wanting to treat dogs and cats*
4 Euthanasia	Conflicts related to performing undesired euthanasia of animals Case 721: *Unnecessary euthanasia* Case 744: *Euthanising wild rabbits* Case 788: *(…) euthanising for behavioural/owner needs* Case 872: *Being asked to euthanase healthy stock animals (zoo) due to poor population management by zoo* Case 503: *euthanasia due to financial constraints*
5 System	Conflicts arising from system deficits that impact on patient care, including lack of resources, staff training, and industry or practice protocols the respondent disagreed with. Case 387: *The practice I worked in didn't have proper facilities* Case 151: *lack of support staff compromising patient care and workflow efficiency* Case 636: (…) *being forced to conform to this level of care due to lack of facilities or drugs or staff at the clinic*

	Case 864: *Practice protocols that create 'blanket rules' and do not allow variation for individual patients* Case 818: *Lack of consistency of care and nurse training to carry out hospital care*
Human interactions	Conflicts that do not focus on prioritization of animal health, but focus on human interactions. This includes interactions with the veterinarian and the veterinary team as well as the public and clients.
1 Negative colleague interactions	Conflicts within the veterinary team, including employers, other veterinarians, support staff and bullying among staff members, that do not impact patient care and do not involve a perception of personal threat to the veterinarian. Case 353: *Having to deal with other vets' egos* Case 404: *Working in a practice where principal and I had vastly differing values* Case 391: *Largely lack of support for new graduate* Case 534: *(…) support staff were lied to and encouraged to lie to clients and where staff worked as veterinarians even though they were not* Case 743: *Corporates with a bullying culture within upper management*
2 Client care and interactions	Conflicts that affect the ability of the veterinarian to care for their clients, including the impact of the cost of veterinary care on the client, client expectations for service, client welfare, and unethical client actions. These conflicts do not involve a perception of personal threat to the veterinarian. Case 434: *I have ethical issues with spending untold amounts of money to extend the life of animals when that money could be used to improve the circumstances of people who have little or nothing* *.* Case 340: *policies that impacted livelihoods of primary producers negatively* Case 431: *dealing with clients who had mental health issues* Case 166: *dealing with clients that expect us as a profession* [to] *provide treatment for free* Case 717: *Unrealistic client expectations, and irate clients where complications arise despite complications being discussed previously*
3 Financial gain	Conflicts arising from pressure to increase financial gain, including revenue generation and over-servicing clients. Case 854: *(…) excessive diagnostic aids to make more money* Case 860: *I have been required to apply the "do you want fries with that" sales technique to on-sell food and other products. I have been pushed to*

	meet turnover targets to maintain my employment, encouraging non-essential procedures and diagnostics to meet those targets. Case 324: *income generated* [was] *more important than patient outcome* Case 279: *I've witnessed practice owners overservice so many times they don't even realize they're doing it anymore* Case 361: *Owner of practice being very money focused and wanting to prolong life of pets to make more money*
4 Employment conditions	Conflicts in relation to employment conditions, including working hours, remuneration, safe physical work environment and dismissal. Case 152: *Being sacked instead of being allowed maternity leave* Case 600: *unsafe equipment/working environment - leaking iso machine, xray safety* Case 872: *Seeing people terminated from positions or having hours taken away for personal reasons with management with no due process* Case 825: *Having to work while fatigued (no sleep)* Case 571: *Spending excessive hours to earn minimal income at the expense of my family*
5 Personal threat	Conflicts with clients or veterinary team members that involve a perception of personal threat, including abuse or an inability to speak up about breaches in patient or client care. Case 644: [I] *found it challenging morally/ethically to know how much to tell the client, i.e. that their pet has been given inappropriate treatment (which I feel is the right/honest thing to do) but not wanting to bad mouth another vet behind their back* Case 736: *Feeling like I have to be bright and bubbly and kind even when a client has done the wrong thing by their animal to avoid having bad reviews written about me online* Case 823: *Abuse from superiors in form of withholding pay, ridicule and physically assaulting me for standing up for patient and staff welfare* C142: *(…) being powerless to do anything about it.* Case 671: *Abusive clients banned due to aggression (…) It's very distressing for staff to deal with abuse*
6 Regulations	Conflicts in relation to regulations and regulatory organisations outside the work environment, including breach of legislation, legislative bodies such as the Veterinary Surgeon's Board, and animal welfare authorities such as the RSPCA. Case 320: *being called by RSPCA as expert witness and "guilty" offender gets off free*

	Case 549: *(…) he had been investigated multiple times by the vet board but they kept letting him practice* Case 529*: Previous work place conducting illegal activity (…)* Case 479: *Use of banned substances in the racing industry* Case 843: *having to tell the relevant government department of a notifiable disease found in clients' livestock*

Discussion

This project investigated moral distress in veterinarians using a mixed-methods approach. Thematic analysis of semi-structured interview responses indicates that a previously proposed model for the moral deliberation pathway in veterinarians based on a moral distress theory for medical nurses[1,7] is consistent with veterinarians' experiences of moral and ethical conflict in clinical practice. In Study 2, a moral distress scale for veterinarians was constructed (MDS-V). The MDS-V has three factors focused on adverse team relations and communication that compromise patient or client care, conflicting interests between client and patient, and perceptions of personal threat. Thematic analysis of free-text responses confirmed that moral and ethical conflicts similar to those disclosed in Study 1 participants occur in a larger cohort of veterinarians. Furthermore, this analysis provided additional information on the moral and ethical conflicts faced by veterinarians in clinical practice. Together, these analyses provide insight into factors associated with moral distress in clinical practice and an instrument to measure these factors.

Former veterinary clinicians recounted moral and ethical conflict and moral distress in their clinical experiences. Situations that triggered a moral and ethical conflict appeared in 20 out of 30 interviews of former veterinary clinicians. The majority of this group (17/20) experienced emotions consistent with moral stress eliciting from such conflicts. Out of the 20, 9 described emotions consistent with moral distress (lasting psychological anguish). How participants perceived and managed moral conflicts was crucial to whether they developed moral distress or moral comfort. Furthermore, when exposed to a moral or ethical conflict, the deliberation path was influenced by factors including values, beliefs and perception of animal value. In previous studies, similar factors have been found to modify the response to ethical challenges in veterinarians[15,25]. Other influential factors in the decision-making of veterinarians include financial considerations and client expectations and wishes[45]. In medical nurses, factors that influence the development of moral distress include individual personal characteristics and values[46]; high moral competency[7]; lack of empathy from peers[47]; and staffing, time and scheduling constraints[47].

This section of the study contributes empirical evidence of the factors influencing the moral deliberation pathway in veterinary clinical practice, attained by applying the moral distress theory developed for medical nurses in the

veterinary context and confirming the moral deliberation pathway proposed by the review of the literature[1,7]. These crucial new understandings can inform intervention strategies. Intervention strategies proposed for medical nurses include increasing professional autonomy[48], improving bioethical education[46,48], and providing structured support within the workplace[47]. Since veterinary clinicians seem to follow a similar moral distress model to medical nurses, it could be hypothesised that similar intervention strategies might be beneficious. Future research could include a prospective study analysing the response to intervention strategies. For such a proposal, measuring moral distress in veterinarians is imperative. Furthermore, moral distress can be associated with other negative occupational aspects such as staff turnover and job dissatisfaction[7,19,21-23,48]. Assessing whether moral distress contributes to aspects such as clinical attrition and professional dissatisfaction in veterinarians requires MD to be measured.

Moral distress was identified when participants described feelings of heavy 'emotional burden', 'feeling awful' and 'terrible', and described the experience as a long-lasting negative emotion. Similarly, nurses experiencing moral distress report feelings of anger, anxiety, depression, sadness, frustration, decreased morale, belittlement, increased distress and psychological and physical exhaustion[8,49]. Moral distress is associated with attrition from practice and staff turnover in medical professionals[19,21-23,48,49], and one participant in this study associated a direct link between moral distress and intention to leave practice. However, other detrimental impacts of moral distress can occur, which includes reduced job satisfaction[49,50], reduced quality of patient care[7], and injury to the professional's moral integrity[8]. These potential negative outcomes highlight the importance of recognising, measuring and minimising the development of moral distress in clinical settings, particularly when a moral conflict cannot be avoided.

A prototype for a psychometric scale to measure moral distress in veterinary clinicians was developed. The resulting Moral Distress Scale for Veterinarians (MDS-V) is comprised of three factors. Factor 1 (Team relations that compromise patient or client care) describes issues with colleagues similar to those experienced by medical professionals, and included most of the items from the original MMD-HP. The items loading in this factor originated from different sub-scales of the original measure. Three items originated in the MMD-HP from a breakdown in team interaction with patient or family. Two others originated from conflicts related to institutional systems and perception of personal threat associated with these. Finally, one item was a veterinary specific addition to the survey. Overall, this sub-scale shows moral conflicts that relate to different aspects of the veterinary team, including leadership, other veterinarians, and support staff who are perceived to be compromising the care the veterinarian can deliver to their patients and clients. These conflicts were reflected in sub-themes grouped under each of the Animal Health and Human Interactions themes identified in the free-text responses, especially in the Clinical Care, Colleagues and System sub-themes of Animal Health, and the Client Care and Interactions sub-theme of Human Interactions. Team interactions, lack of collaboration and differences in values and standards of care seem to be a recurrent root cause of moral conflict in healthcare[19,20,28]. In

veterinarians, the literature focuses on moral conflicts surrounding patient care, euthanasia and issues with clients[4,5,16,18,45]. The perception of incompetent care from colleagues[14], the disproportionate use of diagnostics[26] and therapies[45], and issues with professional working relations have also been previously proposed as possible moral challenges in small veterinary cohorts. This larger study confirms that these conflicting interactions with colleagues are prevalent sources of moral conflict in veterinary practice.

Factor 2 (Conflicting client interactions) of the MDS-V presents items that involve a conflict between clients' interests and the care the veterinarian wishes to provide. These items relate to veterinary costs; care against the best interest of the patient; euthanasia they do not wish to perform, and working with abusive clients. These conflicts were reflected in both the Animal Health and Human Interactions themes identified in the free-text responses and discussed by the participants in Study 1. This can be seen especially in the Animal Health sub-themes of Clients and Euthanasia, and the Human Interactions sub-theme of Client Care and Interactions. In healthcare professionals, situations where the patient care is not prioritised are also a source of moral and ethical conflict[20,27,28,51]. Conflicts regarding patient care, including that it is against the patient's best interest and working with abusive patients or family members, are seen in the paediatric medical literature[20,52]. However, factors associated with the cost of medical care and factors relating to euthanasia are not reported on the measures of moral distress in medical professionals. The items within Conflicting client interactions (Factor 2) have been previously reported as problems associated with moral stress and distress in veterinarians[5,14,18,24,45]. Furthermore, this factor highlights the previously theorised conflict that veterinarians face when balancing patient advocacy with client care[2,32,45]. Balancing patient advocacy and client care seems to be a recurrent source of moral conflict, stress and distress in veterinarians.

Factor 3 (Situations perceived as a personal threat) relates to issues perceived to compromise the integrity or livelihood of the respondent including fears of being fired and litigation, feeling unable to report breaching in codes of ethics and feeling pressured to carry out inappropriate treatments by practice leadership or clients. This sub-scale involved two items gathered from the Personal Threat subscale of the MMD-HP, one item gathered from the patient-related component of the MMD-HP, and one veterinary specific item. Although only one participant from Study 1 reported '*professional suicide*' (Table 1) when discussing animal welfare advocacy in the presence of moral conflicts, issues perceived as a threat to the veterinarians' integrity or livelihood were repeatedly reflected in free-text responses. These conflicts were grouped under the Personal Threat sub-theme of Human Interactions, as well as additional Animal Health and Human Interactions sub-themes depending on the source of the pressure felt to carry out inappropriate treatments. Fears of dismissal, litigation and the perception of being forced to comply with disagreeable procedures are significant conflicts repeatedly reported in medical nurses[7,8,48]. However, these have not been widely exposed as moral conflicts in veterinary practice and have only been proposed as an ethical dilemma in a narrative qualitative investigation on ethical decision making in a cohort of Canadian veterinarians[15]. Although situations of perceived personal threat and pressure to

increase financial gain by over-servicing clients have received limited attention in relation to moral conflict in veterinarians, they been previously discussed in the literature as a source of job dissatisfaction, stress and attrition from veterinary clinical practice[38]. These results provide further evidence that issues perceived as a personal threat are important sources of moral and ethical conflict in veterinary clinicians, which can have practical implications for the veterinary workplace. Recognising and addressing situations that are considered a personal threat can help mitigate moral distress in veterinarians.

Most of the free text responses from the survey aligned with the factors that emerged in the scale development. However, some were not captured by the MDS-V. Some items (like conflicts with regulatory authorities) were not included in the original survey since they were not discussed in Study 1 as potential sources of moral conflict, while others (witnessing animal abuse) did not incur a high enough factor loading to be included in the measure. Our research proposes a pilot scale to measure MD in veterinary clinicians but further validity is needed. Scale validation is an onerous process that requires multiple studies and techniques[65]. Repeating an exploratory and confirmatory factor analysis adding the constructs emerging from the free-text answers would aid in the scale validation process. PCA was used for factor extraction since this simple and psychometrically sound extraction of components was deemed adequate[43]. However, it does not identify possible latent factors underlying the observed variables for which an exploratory factor analysis (EFA) is needed[42]. Although it is likely that both methods would yield similar results, future studies to assess validity of the measure could evaluate any possible latent factors using EFA. Further scale validity for the MDS-V include using EFA to determine underlying latent constructs, perform a content validity analysis, determine concurrent and discriminant validity, and perform a correlation analysis in different populations. Furthermore, administering the MDS-V in a different sample population as part of the validation process could yield different results for moral distress in association with attrition. Responses showed that veterinarians encountered moral conflict when animal care was not being prioritised, which is aligned with items seen in Conflicting client interactions (Factor 2) and the Animal Health theme of the free-text responses. These conflicts include those surrounding euthanasia of patients and clients' financial constraints. Discussing the conflicts arising from human interactions (where the focus is the human interaction rather than the animal patient) is a moral conflict that had not been previously widely explored in veterinarians.

Implications

This study details moral distress as a work-related stressor in veterinary clinicians and establishes a contextualised measure of moral distress in veterinary clinical practice. Study 1 provides evidence that a moral distress theory developed for medical nurses needs to be contextualised to veterinarians and confirms the moral deliberation pathway proposed in a review of the veterinary literature[1]. These findings suggests that similar intervention strategies implemented for healthcare professionals could aid in mitigating the deleterious effects of

moral distress in veterinarians. The analysis of free-text answers in Study 2 provides additional information on moral conflicts in veterinary clinicians that had previously received limited attention. The analysis of free-text answers is not expected to contribute in our understanding of moral distress with the desired rigour and depth[33,53] as it lacks layers of detail and other contextualisation[33] but importantly, it allows us to identify additional sources of moral conflict experienced in veterinary clinical practice.

Finally, the provided instrument to measure moral distress in veterinary clinical practice is a valuable tool to identify moral distress and the associated emotional toll on clinicians presented with moral conflicts. This scale requires being validated in a different cohort of veterinary clinicians[54]. Validating a psychological measure requires a body of research that is beyond one empirical study[54]. The mixed-methods approach strengthens the findings as the constructs relate meaningfully to the qualitative findings both in Study 1 and the themes emerging from the analysis of the free-text answers. However, more research is needed to understand the nature of these constructs and how they may affect the scoring of the postulated scale.

One of the main steps established in the medical literature to reduce moral distress is to recognise the phenomenon when it occurs, name it, and increase self-awareness in the face of moral conflict[55]. Possible strategies to manage moral distress in veterinarians include increasing self-awareness and level of bioethical education and establishing a supportive work environment. These strategies draw on both personal and contextual resources for enhancing resilience in veterinary practice[56,58]. For example, the ability to debrief with and have support from peers has been reported as necessary in medical nurses[49]. This concept has also been discussed in the veterinary literature where peer support, mentorship and supervision has been associated with developing positive coping mechanisms and overcoming negative clinical outcomes[57,58]. It has also been suggested as beneficial for veterinarians dealing with challenging workplace situations[56,59], including ethical conflicts concerning euthanasia[60]. Structured ethical decision-making skills were found to be a valuable tool for veterinary students facing ethical dilemmas[61], and bioethical education has been reported to increase moral comfort in medical nurses[6,7]. Furthermore, developing staff empowerment, including self-awareness via peer and collegial support in a no-blame culture where professionals feel comfortable ‘speaking up’ and debriefing with their teams can be helpful to reduce psychological distress in general[59.]. Additionally, empowerment is established as a helpful strategy to reduce moral distress in nurses[51]. Future research could include a prospective study assessing moral distress in veterinary practice before and after proposed intervention strategies. This research provides a scale to measure moral distress and the theoretical pathway to guide the development of intervention strategies.

Limitations

The potential limitations of this study include self-selection bias due to the voluntary nature of participation in the study. Respondents that had experienced moral conflict, stress or distress may have been more likely to participate than those that did not experience the phenomenon. Further, Study 1 involved participants who had left clinical practice, which could incur recollection bias depending on the time elapsed since the conflicting event occurred. Only 643 out of 920 participants responded to the MD survey. This might be because the moral distress survey was at the very end of a relatively long survey and some participants reported difficulties answering it on a mobile device or because the nature of the questions could have been perceived as intimate or intrusive[62].

Direct comparison of results on the MDS-V to those on the MMD-HP is not possible due to the use of different Likert scales between the measures. The MDS-V is based on a 5-point Likert scale due to the zero value assigned to 'not applicable', and the anchors for values 1 and 4 matched those used for the values 0 and 4 on the 5-point Likert scale of the MMD-HP. Adding a 'not applicable' option to the survey, although it deviates from the scoring of the MMD-HP, was deemed important. A 'not applicable' option allows the respondents the possibility to report that a particular item (situation potentially triggering moral distress) does not apply to their situation whatsoever. This is a different response than one where a situation could apply to them but it never occurs (scored as 1 in frequency) or that it could apply to them but is of no distress (scored as 1 in level of distress). A 'not applicable' response is also different than a non-answer which requires missing data management strategies in the data analysis rather than an interpretation of the result. In future administrations of the survey explicit instructions to the respondents about the intended difference between 'not applicable', 'never/no distress' will be necessary. The MDS-V also contained items focused on specific moral conflicts reported to occur in veterinary clinical practice. Though this enhanced the contextualisation of the measure for its intended audience and purpose, it limits the comparisons that can be drawn with results reported in other healthcare professions based on the MMD-HP. However, direct comparison is only needed if the purpose of future research is to evaluate whether veterinary clinicians experience more or less moral distress than healthcare professionals based on the results of the MMD-HP and the MDS-V. Finally, the MDS-V was developed based on the adaptation of a moral distress scale for medical professionals. Although the results of Study 1 and review of the literature informed the development of the survey for Study 2 and the added items to the new measure had face validity, a content validity analysis was not performed. It is recommended that a content validity analysis is performed in future validations of the MDS-V[63,64]. Furthermore, some elements of patient care, such as insufficient analgesia or inadequate use of medications, and situations, such as the inability to care for clients and conflicts with regulatory authorities, were not included in the scale. However, these items were either not included in the survey as they were not discussed as potential moral conflicts in Study 1 or did not incur a high enough factor loading to be included in the measure, which may indicate that their contribution to moral distress in veterinarians is smaller than the contribution of the other factors included in the measure.

Finally, although the analysis of the free-text answers does generate insight on additional elements contributing to moral and ethical conflicts in veterinary clinical practice; we acknowledge that the richness and depth of the qualitative analysis is limited in free-text responses[33,53]. Despite the limitations of the free-text response format, the results form a meaningful foundation for future research. To build on this research, future research and future administrations of the MDS-V should include these moral conflicts and assess their contribution to moral distress in veterinarians.

Conclusion

Moral distress is an important occupational stressor seen in many healthcare professions and found to have deleterious effects for professionals and patients alike. While observations have been made about moral distress in veterinarians, a more detailed investigation of the phenomenon in these professionals was lacking. This study provides insight into the elements involved in the development of moral distress in veterinarians, including influential factors, description of morally conflicting situations, and possible outcomes of the moral deliberation process. Moral distress has been measured using psychometric scales in healthcare professionals and other occupations but not in veterinarians. This study created a scale to measure moral distress in veterinarians. Identifying situations associated with possible sources of moral stress and distress in clinical practice and implementing strategies to help address these stressors may contribute to enhancing the resilience of the veterinary profession.

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Supplementary materials

Appendix 1: Moral distress survey questions

As a veterinary clinician. In relation to the following situations, how often did they occur and how distressing did you find them?
The questions were worded in past tense when presented to former veterinary clinicians and were introduced by 'Thinking back to your time as a veterinary clinician…'

5-point Likert scale from: 0= not applicable, 'never'/'not distressing' = 1 to 'very frequently'/'very distressing' = 4.

1- Witness veterinarians give 'false hope' to a client regarding a patient
   - How often does this occur?
   - How distressing do you find it?
2- Follow the client's (family's) insistence to continue aggressive treatment even though I believe it not to be in the best interest of the patient.
   - How often does this occur?
   - How distressing do you find it?
3- Feel pressure to order or carry out orders for what I consider to be unnecessary or inappropriate tests and treatments.
   - How often does this occur?
   - How distressing do you find it?
4- Be unable to provide optimal care due to pressures from management (administrators) or insurers to reduce costs
   - How often does this occur?
   - How distressing do you find it?
5- Be unable to provide optimal care due to pressures from clients to reduce costs
   - How often does this occur?
   - How distressing do you find it?
6- Continue to provide aggressive treatment for a patient who is most likely to die regardless of this treatment
   - How often does this occur?
   - How distressing do you find it?
7- Be pressured to avoid taking action when I learn that another veterinarian, nurse or other team colleague has made a medical error and does not report it
   - How often does this occur?
   - How distressing do you find it?
8- Be required to care for patients whom I do not feel qualified to care for
   - How often does this occur?
   - How distressing do you find it?
9- Participate in care that causes unnecessary suffering or does not adequately relieve pain
   - How often does this occur?
   - How distressing do you find it?
10- Watch patient care suffer because of a lack of provider continuity
   - How often does this occur?
   - How distressing do you find it?
11- Follow a colleague's request not to discuss the patient's prognosis with the clients
   - How often does this occur?
   - How distressing do you find it?
12- Witness a violation of a standard of practice or a code of ethics and do not feel sufficiently supported to report the violation

- How often does this occur?
- How distressing do you find it?

13- Participate in care and procedures that I do not agree with, but do so because of fears of litigation or complaints
- How often does this occur?
- How distressing do you find it?

14- Participate in care and procedures that I do not agree with, but do so because of fears of being fired
- How often does this occur?
- How distressing do you find it?

15- Be required to work with other team members who are not as competent as patient care requires
- How often does this occur?
- How distressing do you find it?

16- Witness low quality of patient care due to poor team communication
- How often does this occur?
- How distressing do you find it?

17- Feel pressured to ignore situations in which clients have not been given adequate information to ensure informed consent
- How often does this occur?
- How distressing do you find it?

18- Be required to care for more patients than I can safely care for
- How often does this occur?
- How distressing do you find it?

19- Experience compromised patient care due to lack of resources/equipment etc.
- How often does this occur?
- How distressing do you find it?

20- Experience lack of administrative action or support for a problem that is compromising patient care
- How often does this occur?
- How distressing do you find it?

21- Have excessive documentation requirements that compromise patient care
- How often does this occur?
- How distressing do you find it?

22- Fear retribution if I speak up
- How often does this occur?
- How distressing do you find it?

23- Feel unsafe/bullied among my own colleagues
- How often does this occur?
- How distressing do you find it?

24- Be required to work with abusive clients who are compromising quality of care
- How often does this occur?
- How distressing do you find it?

25- Feel require to over emphasize productivity at the expense of patient care
- How often does this occur?
- How distressing do you find it?

26- Be required to care for patients who have inconsistent or unclear treatment plans or who lack goals of care.
- How often does this occur?
- How distressing do you find it?

27- Work within power hierarchies in teams, units and my practice (institution) that compromise patient care
- How often does this occur?
- How distressing do you find it?

28- Participate on a team that gives inconsistent messages to clients
- How often does this occur?

- How distressing do you find it?

29- Work with team members who do not treat patients with dignity and respect
- How often does this occur?
- How distressing do you find it?

30- Working in a situation where the owner would not pay for the recommended treatment
- How often does this occur?
- How distressing do you find it?

31- Carrying out the owner's wishes that were not in the best interest of the patient
- How often does this occur?
- How distressing do you find it?

32- Assisting other veterinarians who you believed were providing incompetent care
- How often does this occur?
- How distressing do you find it?

33- Performing euthanasia in general
- How often does this occur?
- How distressing do you find it?

34- Performing euthanasia for reasons you did not agree with
- How often does this occur?
- How distressing do you find it?

35- Suspected patient/pet abuse or cruelty
- How often does this occur?
- How distressing do you find it?

Thinking back to your time as a veterinary clinician, were there any other elements that you considered to cause moral or ethical conflict? (please specify)
Small space for comment

Appendix 2: Moral Distress Scale for Veterinarians (MDS-V)

As a veterinary clinician. In relation to the following situations, how often did they occur and how distressing did you find them?
A total moral distress score can then be calculated by adding all the items together for a score ranging from 0-256.

5-point Likert scale from:
0 = Not applicable
1= Never / not distressing
2= Occasionally / slightly distressing
3= Frequently / distressing
4= Very frequently / very distressing

1. Participate on a team that gives inconsistent messages to clients
2. Experiencing lack of administrative action or support for a problem that is compromising patient and/or client care
3. Working within power hierarchies in teams, units and in my practice (or institution) that compromise patient and/or client care
4. Witnessing low quality of patient and client care due to poor team communication
5. Being required to care for patients who have inconsistent or unclear treatment plans or who lack goals of care
6. Assisting other veterinarians who were providing incompetent care
7. Working in a situation where the client would not pay for the recommended treatment
8. Being unable to provide optimal care due to pressures from clients to reduce costs
9. Carrying out the client's wishes that were not in the best interest of the patient
10. Performing euthanasia for reasons I do not agree with
11. Being required to work with abusive clients
12. Continue providing aggressive treatment to a patient who is most likely to die regardless of this treatment
13. Participate in care and procedures I do not agree with, but doing so because of fears of being fired
14. Witness a violation of standard of practice or code of ethics and do not feel sufficiently supported to report the violation
15. Feel the pressure to order or carry out orders for what I consider to be unnecessary or inappropriate tests and treatments
16. Participate in care and procedures I do not agree with, but doing so because of fears of litigation or complaints

Chapter 6: Attrition from veterinary clinical practice: Potential contributions of motivations to be a veterinarian, professional quality of life, job satisfaction, work-life balance and moral distress.

Summary

Moral distress is an important occupational stressor experienced by veterinary clinicians. In chapter 5 moral distress in veterinary clinical practice was examined in depth. The moral deliberation pathway proposed in chapter 2, based in a theory developed for medical nurses was confirmed. A scale to measure moral distress in veterinary clinicians was developed and further moral and ethical conflicts were outlined. With a tool to measure moral distress in veterinary clinical practice, we can assess the relationship of MD in attrition. In the following chapter, the relationship between moral distress, motivations to be a veterinarian, professional quality of life, elements of job satisfaction and work life balance and attrition from clinical practice are investigated.

Statement of authorship

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By signing the Statement of Authorship, each author certifies that:

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Attrition from veterinary clinical practice: Potential contributions of motivations to be a veterinarian, professional quality of life, job satisfaction, work-life balance and moral distress.

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Abstract

Understanding the reasons for veterinary attrition has become important for the veterinary profession since recent reports indicating low retention in veterinary clinical practice. Several reasons for attrition have been proposed in the literature, including working long hours, low remuneration, experiencing a negative emotional state in relation to work, personal values, fatigue, and other negative experiences. However, the relationships between attrition and what motivates veterinarians, professional quality of life, aspects of job satisfaction, work-life balance, and moral distress are aspects still to be investigated. This study aims to ascertain possible relationships between these variables and veterinary clinical attrition.

To achieve this aim, a cohort of current and former veterinary clinicians were surveyed using psychometric scales to measure motivations to be a veterinarian, professional quality of life, elements of job satisfaction, moral distress, and work-life balance. A logistic regression model indicated that veterinarians had higher odds to have left clinical practice if they were more motivated by social purpose, had lower scores for burnout and compassion satisfaction, were dissatisfied with working hours and schedules, or by personal (intrinsic) reward. These findings indicate that other variables associated with attrition exist beyond those currently reported in the literature, such as dissatisfaction with working hours and wages. The findings suggest that increasing compassion satisfaction and professional satisfaction may improve retention and provides indications for further research regarding contribution of burnout and collegial relations. Further research is needed due to the limitations on the use of the current available measures to get clarity in the possible contributions of these variables to attrition from clinical practice. Further research should include the development of veterinary-specific job satisfaction measures to develop evidence-based retention strategies.

Introduction

The veterinary profession is concerned about a perceived shortage of veterinary clinicians, despite an expected surplus in Australia[1] and overseas[2,3]. This perceived shortage could be attributed to recent surveys reporting veterinary practices struggling to fill vacancies[4] and reports of reduced retention[5,6]. In 2021, attrition of veterinarians from clinical practice was 23% and intention to leave veterinary medicine overall was 27% of the surveyed cohorts[7,8]. Furthermore, turnover intention (a desire to leave current employment) is over 40% as documented in reports from the UK[6]. Such numbers align to just below what other professions with problematic attrition rates report such as teachers and nurses with estimated attrition rates of approximately 35%[9,10]. Despite the numbers, it is important to observe attrition rates in relation to employment needs and the veterinary profession seems to be in need of veterinary clinicians. Therefore, investigating the underlying factors that might be associated with veterinary clinical attrition is important for the veterinary profession worldwide to improve retention and solidify the workforce. Several factors have been attributed to attrition from veterinary clinical practice, including employment conditions and the influence of personal factors[11]. A 2021 qualitative study interviewing 26 former veterinary clinicians concluded that personal factors played a role in attrition from veterinary clinical practice. The factors identified include motivations, character and beliefs, physical and mental health, and personal relationships, among others[11]. Those personal factors, in combination with work-related experiences such as employment conditions, negative clinical outcomes, and negative relationships with employers, colleagues and clients, contributed to a decision to leave practice[11]. Employment conditions, hours of work, and salary are commonly reported reasons for attrition in veterinarians from different areas in Australia and overseas[5-7,11-13]. However, a comprehensive investigation into other underlying sources of discontent and their contribution to attrition from practice is required. The following paragraphs outline some of the characteristics that were linked to attrition from clinical practice in the qualitative exploration, such as motivations to be a veterinarian, professional quality of life, job satisfaction, work-life balance, and moral distress. These variables were selected due to their relevant influence on attrition from clinical practice, as shown in a previous qualitative study[11].

Motivations

In a recent qualitative study, one of the reasons that influenced former clinicians to leave practice was that their motivations to be veterinarians were not met[11]. Some former clinicians conveyed that they were motivated to be veterinarians by their desire to help animals and people and explained the frustration and stress when they were unable to meet such desires[11]. Furthermore, greater intrinsic motivations (being moved to do something because it is inherently enjoyable or interesting[14]) have been associated with a reduction in turnover intentions in the public sector[15], industrial sector[16] and medical nurses[17]. It is possible that career motivations (the impetus or inspiration to do something[18]) could also be associated with attrition or turnover intentions in veterinarians. The motivations to be a veterinarian have received some attention in the veterinary education literature. In

veterinarians, positive attitudes towards animals have been an influential factor for people to choose veterinary practice[19-22]. Other motivational elements to be a veterinarian include interest in learning and knowledge, childhood vocation, and community and social contribution[20-22]. However, whether these particular motivators influence attrition from clinical practice is yet to be explored.

Compassion satisfaction and compassion fatigue

Another personal factor associated with attrition from veterinary clinical practice is the development of a negative emotional state[11]. Veterinary professionals' negative emotional state and psychological ill-health have been previously documented[23-26]. The literature reports veterinarians are experiencing compassion fatigue, including burnout and secondary traumatic stress[25,27,28]. However, positivity at work where the veterinarian experiences job satisfaction, compassion satisfaction, and professional achievement have also been reported[24,29-31]. These elements of professional quality of life (compassion satisfaction and fatigue) have been previously discussed in other veterinary staff, and students[27,32,33]. Professional quality of life is defined as *'the quality one feels in relation to their work as a helper'*[34]. The concept incorporates compassion satisfaction and compassion fatigue; the latter divided into burnout and secondary traumatic stress. Compassion satisfaction is defined as the pleasure a professional experiences from being able to do their work well, and compassion fatigue includes both burnout (exhaustion, frustration, anger, and depression), and secondary traumatic stress (the negative feelings associated with fear) in relation to work-related trauma. Professional quality of life is complex and can be closely related to personal characteristics and elements of the work environment[34]. For example, Pizzolon *et al.* found a negative association between job satisfaction and secondary traumatic stress and that a toxic work environment was positively associated with burnout[32]. The construct has been successfully measured in other professionals, such as nurses[35], teachers[36], and veterinary staff[27]. However, the specific relationship between the components of professional quality of life and veterinary attrition from practice has not been investigated.

Job satisfaction

Job satisfaction is a cognitive construct defined as the pleasurable emotion experienced with the appraisal that one's job is achieving or facilitates the achievement of one's job values[37]. On the other hand, job dissatisfaction is the negative emotion elicited when the appraisal is that one's job is frustrating and blocking the achievement of one's job values[37]. Lower job satisfaction is considered one of the most recurrent indicators of staff turnover in different professionals[38-40]. Job satisfaction has been explored in healthcare and encompasses many elements of the working environment. Elements of job satisfaction in physicians and nurses include collegial relations and support, extrinsic rewards, workload, work-life/family balance, personal (intrinsic) satisfaction, and professional growth[40-43]. In veterinarians, job satisfaction has been positively associated with feeling valued at work, having role models, and acceptance of a culture of long hours[44]. Elements of job satisfaction, such as work culture or

practice atmosphere, perception of lower salary and higher hours of work, have been reported by veterinarians as reasons for staff turnover, attrition from rural veterinary practice, and clinical practice overall[5,11-13]. Notably, job satisfaction in veterinary professionals has previously been assessed using single-item measures ("How satisfied are you with your job?")[45] or described in qualitative studies[11]. Such an approach creates a gap in understanding which workplace elements are associated with job dissatisfaction in veterinarians and whether any are associated with attrition from practice. Understanding job satisfaction is also essential because it has been positively associated with team effectiveness in veterinary staff[32,45] and increased quality of patient care in healthcare[46].

Work-life balance

Another aspect of work satisfaction is work-life balance. Work-life balance (WLB) is defined as an individual's ability to meet their work, family and other non-work responsibilities[47]. Work-life balance (WLB) includes family concerns, time off, inability to relax, and complying with emergency duties in veterinarians[5,11,48]. Some studies have associated low work-life balance with attrition from farm animal practice[5], emergency clinical practice[48], and clinical practice in general[11]. For example, 55% of respondents who no longer worked in rural veterinary practice reported 'emergency duties', and 54% reported 'time off' as the reason for leaving rural veterinary practice[5]. These studies reported veterinarians' dissatisfaction with their WLB through surveys or interviews but without the use of a validated measure resulting in undetermined validity of the WLB variable. Thus, it could be argued that WLB in veterinarians requires further adequate measurement. In other Australian workers, WLB has been negatively associated with turnover intention (higher WLB, lower turnover intention) and positively associated with family and job satisfaction[49]. Measuring WLB in veterinarians and its association with attrition from practice is important; however, there is no literature on this at present.

Moral distress

Finally, another factor associated with attrition in medical nurses and doctors is moral distress[50-54]. Moral distress is described as the psychological anguish experienced when a professional encounters a situation where they cannot follow their perceived correct moral path[55-57]. This creates an undercurrent of dissatisfaction by eliciting a negative emotional state, which has been associated with job dissatisfaction in medical nurses[58]. In veterinarians, moral conflict and moral distress are prevalent sources of stress[55,59]. Considering the contribution of moral distress to occupational stress and attrition in medical nurses, it can be theorised that moral distress could also contribute to attrition from practice in veterinarians.

Overall, a positive relationship between contextual variables such as lower salary, greater hours of work, region of work, and field of work and attrition from veterinary clinical practice has been established[6,7,12]. Contrastingly,

other psychological factors such as job satisfaction, professional quality of life, motivations to be a veterinarian, moral distress, and work-life balance still require thorough investigation. The present study aims to assess the possible relationships between attrition from clinical practice and the psychological factors of motivations to be a veterinarian, professional quality of life, job satisfaction, work-life balance, and moral distress.

Methods

A survey was conducted of current and former veterinary clinicians from November 2019 until February 2020 and included psychometric measures and demographic questions (psychological variables surveyed in supplementary materials). An invitation to participate in the surveys was disseminated through approved Facebook groups (with no paid advertisement) and six out of the seven alumni offices of Australian universities offering veterinary qualifications. Respondents were required to indicate whether they were currently working in clinical practice; defined as: 'Veterinarians that diagnose and treat animal patients (individuals or herds)'. Respondents who were currently working in clinical practice responded to survey A, whilst those who had left clinical practice responded to survey B. Surveys A and B were primarily identical, differing only by use of past tense wording in the questions for former clinicians. There was a total of 920 valid responses. Responses were excluded from the analysis if the outcome question (currently working as veterinary clinicians or not) was blank, if the respondent was retired, and if less than 75% of the survey, including the scales of the psychological variables, was answered. The total responses for the initial analysis was 773 and the logistic regression model used 600 responses. Exclusions were 16% of total responses (n = 920) for the initial analysis, and the regression model used listwise deletion, excluding 35% of total responses (n = 920). This research was approved by The University of Adelaide Human Research Ethics Committee (H-2017-229).

Description of the variables

The variables used in this analysis included demographic and work-related factors, and results from psychometric measures of psychological variables. The psychological variables were selected based on a qualitative study that explored former veterinary clinicians[11] reasons for attrition from practice and the availability of an existing measure for the variable. The selected variables were: 1) motivations to be a veterinarian; 2) professional quality of life; 3) aspects of job satisfaction; 4) work-life balance; and 5) moral distress. This study forms part of a larger research project investigating veterinary attrition from clinical practice. The current survey collected demographic factors, working conditions (such as hours and salary) and various psychological measures. Although it was initially intended to analyse all factors together, over 100 participants did not respond to the study's psychological measures. This disparity prompted the decision to separate the data into two studies. The previously published study (chapter 4)[7] analysed demographic and work-related factors, and this study focuses on the analysis of the psychological variables. The variables already analysed in chapter 4 are included

here to account as confounders only. The demographic variables included in the current study are: 1) gender, 2) region of work, 3) field of work, and 4) presence of on-call duties as described by Arbe-Montoya *et al*[11]. These factors were selected as they had a statistically significant association with attrition in chapter 4.

Variables are indicative of the current working conditions for existing clinicians, and indicative of conditions just prior to attrition for former clinicians. Salary is reported in Australian dollars per annum and adjusted for inflation using the Reserve Bank of Australia Inflation Calculator. Inflation adjustments were made for the responses of former veterinary clinicians comparing the salary on the year they left clinical practice and the date of data analysis (2019-2020). Salary and hours of work were evaluated as continuous variables.

Veterinary career motivations questionnaire

Motivation to be a veterinarian was evaluated using the 'Veterinary career motivations questionnaire' designed to underpin veterinary career choices[21]. The questionnaire contains six sub-scales (Vocational identity, Challenge and learning, Animal orientation, People orientation, Social purpose, and Career affordances) and includes 22 items. The measure was validated in a cohort of experienced and recently graduated veterinarians and demonstrated good internal consistency in five of the sub-scales with Cronbach alphas ranging from 0.71 to 0.94. For one sub-scale (career affordances), there was an α of 0.63 in one of the study's populations, which was considered marginally acceptable by the authors[21]. The measure uses a five-point Likert scale for each item ranging from 1 (not at all like me) to 5 (very much like me), answering the following statement: *'I am/was motivated to be a veterinary clinician because…I want to help people'* (for example).

Professional quality of life

Professional quality of life was measured using Stamm's ProQOL survey[34], a commonly used 30-item scale (10 items per sub-scale) that measures compassion satisfaction, and compassion fatigue in caregiving workers. Compassion fatigue is divided into two sub-scales that measure burnout and secondary traumatic stress. The ProQOL has often been used in different professionals and has shown good reliability for compassion satisfaction (α = .88) and secondary traumatic stress (α=.84), and adequate reliability for burnout (α = .70) when assessed in a cohort of veterinary students[33].The scores of questions that needed reversing as required by the ProQOL manual[34] were reversed. The score of each sub-scale was calculated by summing the results of each item, then the raw total scores of each sub-scale were used in the analysis. The measure uses a Likert scale from 1 (never) to 5 (very often) to rank each statement in terms of frequency in the past 30-days. The 30-day timeframe was eliminated from the question for this cohort; as this study required former veterinary clinicians to recall aspects of their work before they left clinical practice. The ProQOL statements for former veterinary clinicians answered the following question: *Thinking back to your time as a veterinary clinician, how often did*

you experience the following? The researcher acknowledges that the use of the ProQOL in former veterinary clinicians (that are responding in retrospection of over 30 days) is not the form this measure was intended to be used[34]. The measure was selected for this study due to the limited scales available to measure this construct in former veterinary clinicians. The researcher chose to use this measure to gain some possible indications of relationships between professional quality of life and attrition from veterinary clinical practice. The interpretations that can be drawn from the results are limited but can be used for hypothesis generation and provide possible indications for future research in the associated variables.

Job satisfaction

Job satisfaction was evaluated not as a whole construct. Instead, individual elements were assessed using sub-scales of two job satisfaction measures created for medical nurses[41,43]. Evaluating different aspects (in contrast to using a single general job satisfaction question) allowed the study to capture the diverse factors that might influence job satisfaction. However, due to the lack of a valid job satisfaction measure in veterinary clinicians, the measures and sub-scales were selected from identified elements of job satisfaction outlined by former veterinary clinicians in a previous qualitative study[11]. The sub-scales used were derived from the McCloskey/Mueller Satisfaction Scale (MMSS)[60] for nurses (re-validated by Lee *et al*[41]) and the Measure of Job Satisfaction (MJS) by Traynor and Wade[43]. The MMSS was developed in 1990[60] for nurses in a hospital setting, and was recently validated by Lee for a different nurse population[41]. Lee's re-validated scale measure was used in this study, which contains five sub-scales and 25 items[41]. Four sub-scales were considered relevant for use in this study. These were: 1) Work culture and conditions (abbreviated to 'work culture'), 2) Scheduling and family/work balance (abbreviated to 'scheduling'), 3) Collegial relationships, and 4) Extrinsic reward. The 'Professional opportunities' sub-scale that evaluates opportunities to participate in research and publish was eliminated from the study for having little relevance to veterinary clinicians. Internal reliability was good with Cronbach alphas ranging from 0.71 to 0.87[41]. The sub-scales taken from Traynor and Wade were 'Personal satisfaction' which evaluates the satisfaction with the intrinsic nature of the work and 'Satisfaction with Workload' (abbreviated as workload), each sub-scale containing 5 items. both sub-scales had a Cronbach alpha of 0.88 in the original development of the measure[43]. The sum of each item calculated the scores of each sub-scale, and each item answered the question: *To what extent were/are you satisfied or dissatisfied with the following items? The time available for patient care* (for example).

Work-life balance and moral distress

Work-life balance was measured using a validated concise scale developed for Australian and New Zealand general workers from healthcare, education, finance, manufacturing, public service and non-government organisations[49]. This four-item scale measured workers' reflections of their work and non-work activities. Using

a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) and the respondents answered the question: '*When I reflect over my current/former work as a veterinary clinician and non-work activities (your regular activities outside of work such as family, friends, sports, study etc.) when working as a veterinary clinician, I conclude that (…) I had difficulty balancing my work and non-work activities'* (for example). The measure showed good internal consistency in its development with a Cronbach alpha ranging between 0.84 to 0.94 in the different test populations. The score was calculated by adding the results of the four items with the score for item 2 being reversed. Finally, moral distress was evaluated using a recently developed scale that measures moral distress (the frequency of a morally distressing event and the level of distress that said event caused) in veterinarians (chapter 5). This three sub-scale measure was developed using a section of data also used for this study. The study aimed to evaluate moral distress as a whole rather than by three different factors. Thus, a single total moral distress score was calculated by multiplying the frequency of the stressor event by the distress it caused and adding the scores of the three sub-scales. The measure showed good internal reliability with Cronbach's alphas of 0.85, 0.84 and 0.77 for each of its three sub-scales.

All measures used a 1-5 Likert scale (see Appendix A), except for moral distress, ranging from 0-4 (see Appendix A). It was an ethics requirement for respondents to be able to skip questions. Therefore, missing data was a concern for analysing the schedules sub-scale from the job satisfaction measure as several respondents skipped this question (n=103, 13% of total responses used in this chapter). We assumed those were non-parents and therefore this question was not applicable to them. To avoid selection bias against the respondents that skipped this question, it was decided to impute the response of that variable as '3' (nor agree nor disagree) and use those responses in the regression model. Listwise exclusion of missing data was used for both logistic regression models (after imputation of '3' to the job satisfaction measure). The estimated time for survey completion was of 30 minutes. Further descriptions of the psychometric variables and example questions are presented in Table 1 below.

Data analysis

A binomial logistic regression model was used to investigate the potential contributions of the various variables to attrition from clinical practice using IBM SPSS 26® (V.26). An initial analysis was performed using independent sample *t*-tests to determine which psychometric variables were included in the model. Only the variables that had a significant contribution (cut off $p<0.2$) to the outcome variable were included in the regression model[61,62]. All variables were assessed for internal consistency using an acceptable Cronbach alpha score of 0.65 or above[62]. The regression model used listwise exclusions and met the required assumptions; the outcome was dichotomous (stayed vs left clinical practice), had more than one independent variable and variables were mutually exclusive, there were 10 cases or more per independent variable, and data fit the test of linearity. Outliers were retained in the model since they were representative of the data. Variables were considered

significant if the *p-value* was < 0.05. The model contained 18 variables, which were: 1) Gender, 2) Region of work, 3) Field of work, 4) On-call duties, 5) Hours of work, 6) Salary, 7) Motivations – Vocational identity, 8) Motivations – Animal orientation, 9) Motivations – Social purpose, 10) Motivations – Career affordances, 11) Burnout, 12) Compassion satisfaction, 13) Job satisfaction – Work culture, 14) Job satisfaction – Scheduling, 15) Job satisfaction – Collegial relations, 16) Job satisfaction – Extrinsic rewards, 17) Job satisfaction – Personal satisfaction, and 18) Work-life balance.

Table 1: Description of the variables

Psychometric variables	Description	Example questions
Motivations to be a veterinarian[21]		
Vocational identity	Early vocational identity with the profession	*It was a childhood dream to become a veterinarian* *It is all I ever wanted to be*
Animal orientation	Affinity for animals	*I love animals* *I want to prevent animal suffering*
People orientation	Affinity and desire to help people	*I like interacting with clients* *I like working with people*
Challenge and learning	Interest in problem solving and learning	*I like the challenge of veterinary work* *I like solving problems*
Social purpose	Desire to make a social contribution	*I can make a difference to society* *I can contribute to the community*
Career affordances	Extrinsic work-related reward	*It offers job security* *It provides a decent income*
Professional quality of life[34]		

Compassion Satisfaction	Pleasure derived from doing the work well and helping others. Includes positive feelings towards colleagues, ability to contribute to work settings or the greater good.	*I feel invigorated after working with those I help* *My work makes me feel satisfied* *I am proud of what I can do to help*
Compassion Fatigue - Burnout	Experiencing exhaustion, frustration, anger and depression associated with work	*I am happy (score reversed)* *I feel trapped by my job as a vet (originally 'helper')* *I feel overwhelmed because my workload seems endless*
Compassion Fatigue - Secondary Traumatic Stress	Negative feelings derived by fear and work-related trauma	*I jump or am startled by unexpected sounds* *I think that I might have been affected by the traumatic stress of those I help* *As a result of being a vet (originally my work as a helper), I have intrusive, frightening thoughts*
Elements of job satisfaction[41,43]		
Work culture	Administration, recognition from superiors, and control of work settings.	*Encouragement and positive feedback* *Control over your work settings*
Scheduling	Working hours, rosters and perception of family/work balance	*Hours that you work* *Parental leave time**
Collegial relations	Social contact with peers and teamwork	*Opportunities for social contact at work* *Opportunity to work with other disciplines*

	Extrinsic reward	Salary and other work-related benefits	*Salary* *Vacation*
	Personal satisfaction	Experiences and feelings of worthwhile and accomplishment	*The feelings of worthwhile accomplishment you get from your work* *The contribution you make to patient care*
	Workload	Ability to complete tasks and provide patient care during allocated working hours	*Your workload* *The time available for patient care*
Work-life balance (WLB)[49]			
		Perception of balance between work and non-work activities	*I have difficulty balancing my work and non-work activities (score reversed)* *Overall, I believe that my work and non-work life are balanced*
Moral distress (chapter 5)			
		Frequency and level of distress associated with experiencing moral and ethical conflicts	*Witness a violation of standard of practice or code of ethics and do not feel sufficiently supported to report the violation* *Performing euthanasia for reasons I do not agree with* *Working in a situation where the client would not pay for the recommended treatment*

Results

Data description: Output and demographic variables

The survey had a total of 920 responses, the study analysed 773 responses after exclusions were removed, and the regression model used 600 responses. Of these, 568 (74%) were veterinarians in clinical practice, and 205 (27%) had left clinical practice. Most of the respondents were female (71%), worked in small animal practice (61%), worked in metropolitan regions (57%), and did not have on-call duties (52%). The mean salary for current

veterinarians was $A88,770 per annum and $A74,590 per annum for veterinarians that had left clinical practice. The mean average hours of work per week in current veterinarians was 37.2 and in former clinicians was 45.2. Table 2 displays the demographic distribution of the sample.

Data description: Distribution of psychometric variables

The preliminary assessment used an independent variable *t*-test to evaluate the individual contributions of each psychometric variable to the outcome variable. Table 3 below displays the results of this preliminary analysis. As mentioned above, only variables with a p< 0.2 were included in the regression model. All variables showed good internal consistency (Cronbach alpha >0.7), except for 'career affordances', and 'collegial relations' which had a marginally adequate Cronbach Alpha of 0.65 and 0.68 respectively.

Table 2: Demographic results

	Current veterinary clinicians n (%)	**Former veterinary clinicians** n (%)	**Total** n
Gender			
Female	411 (72.4%)	137 (66.8%)	548
Male	155 (27.3%)	68 (33.2%)	223
Other	2 (0.4%)	0	2
Field of work			
Small animal	355 (62.7%)	112 (54.9%)	467
Mix practice, equine, production animals, other	140 (24.7%) 71 (12.5%)	82 (40.2%) 10 (4.9%)	222 81
Region of work			
Metropolitan only	333 (58.9%)	102 (50.0%)	435
Rural/semi-rural	222 (39.3%)	83 (40.7%)	305
Both	10 (1.8%)	19 (9.3%)	29
On call duties			
Yes	211 (37.3%)	157 (76.6%)	368

No	355 (62.7%)	48 (23.4%)	403

	Mean +- SD	**Mean +- SD**	**Mean for both groups**
Annual salary	88.77 (52.10)	74.63 (31.61)	85.06 (48.02)
Hours of work	37.16 (14.38)	45.19 (11.89)	39.26 (14.21)

Table 3: Preliminary analysis of psychometric variables. The table shows the results of a *t*-test assessing the individual contributions of each psychometric variable and the outcome variable.

Variable name	**Current Clinicians Mean (SD)**	**Former Clinicians Mean (SD)**	***p*-value**	**Range**	**Cronbach alpha**
Motivations People orientation	10.58 (2.71)	10.44 (2.81)	.54	1-15	0.83
Motivations Animal orientation	21.74 (3.07)	20.21 (3.79)	.001	1-25	0.88
Motivations Social purpose	10.97 (2.56)	11.37 (2.57)	.06	1-15	0.84
Motivations Challenge and learning	16.90 (2.46)	16.67 (2.44)	.25	1-20	0.77
Motivations Career affordances	13.06 (3.02)	12.04 (3.04)	<.0001	1-20	0.65

Burnout	27.53 (6.76)	29.89 (6.98)	<.0001	1-50	0.83
Compassion Satisfaction	35.15 (6.81)	31.92 (6.93)	<.0001	1-50	0.91
Secondary Traumatic Stress	25.71 (6.84)	25.04 (7.31)	.25	1-50	0.85
Job Satisfaction Collegial Relations	17.68 (3.29)	16.66 (3.44)	<.0001	1-25	0.68
Job Satisfaction Ext. Rewards	9.27 (2.80)	7.59 (2.65)	<.001	1-15	0.76
Job Satisfaction Work culture	23.34 (5.83)	20.65 (6.31)	<.0001	1-35	0.88
Job Satisfaction Scheduling	26.26 (5.50)	22.06 (6.01)	<.0001	1-40	0.85
Job Satisfaction Workload	15.42 (4.59)	15.05 (3.97)	.32	1-25	0.85
Job Satisfaction Personal Satisfaction	19.86 (3.24)	17.94 (3.71)	<.0001	1-25	0.81
Work-life Balance	11.95 (4.33)	9.92 (4.30)	<.0001	1-20	0.95
Moral Distress	65.27 (35.28)	69.03 (34.33)	.27	0-256	N/A

**p-value for significance <.05*

Logistic regression modelling

A binomial logistic regression was performed to evaluate the relationship between attrition from clinical practice and selected variables. Only the variables with a p-value of <0.2 in the preliminary analysis were included in the model, as these were considered the contributing variables. The model indicates adequate goodness of fit by: a) being statistically significant $x^2(10) = 248.67$ p <0.001 and b) having a non-significant Hosmer and Lemeshow test X2 (10) = 2.65, p = 0.95. The model explained 49% (Nagelkerke R^2) of the variance and correctly classified 84.3% of the cases, with a positive predictive value of 76.4% and a negative predictive value of 86.5%. Specificity was 93.2% and sensitivity 60.2%.

Rural veterinarians had lower odds to have left clinical practice than their metropolitan counterparts (p <0.0001), and veterinarians working in small animal practice had higher odds to have left than those working in 'other' fields of veterinary clinical practice (p = 0.01). However, there was no significant difference between veterinarians working with small animals and those working in mixed and equine practice (see Table 4). Veterinarians required to be on-call had higher odds to have left practice than those without on-call requirements (p <0.0001). Veterinarians working longer hours (p <0.0001) and with lower salaries (p <0.0001) also had higher odds to have left clinical practice.

Regarding the psychometric variables, veterinarians scoring higher in 'Motivations – Social purpose' had 1.3 higher odds to have left clinical practice than those with lower scores for this item (p<0.001). Only the 'Burnout' and 'Compassion satisfaction' variables of professional quality of life were included in the model. In the model both were negatively associated with attrition. In terms of job satisfaction, higher satisfaction with collegial relations, lower satisfaction with scheduling, and lower personal satisfaction were significantly associated with attrition from clinical practice. Table 4 below displays the logistic regression results.

Table 4: Binomial logistic regression results

Includes: B coefficient, standard error of the unstandardised B coefficient, Wald predictor variable, p-value, odds ratio (Exp B) and 95% odds ratio confidence intervals.

Predictor	B	S.E.	Wald	Sig (p)	OR	95% C.I. for OR	
						Lower	Upper
Gender†	0.159	0.301	0.279	0.597	1.179	0.650	2.115
Region of work							
Metropolitan Only*			25.061	<.0001			
Rural and Semi-rural Only	-1.642	0.369	19.795	<.0001	0.194	0.094	0.399
Both	1.032	0.715	2.083	.149	2.807	0.691	11.397
Field of work							
Small Animal*			7.140	.028			
Mix practice quine/Production	0.160	0.338	0.225	.635	1.174	0.605	2.278
Other	-1.602	0.625	6.567	.010	0.201	0.059	0.686
On Call	2.247	0.343	43.038	<.0001	9.464	4.836	18.522
Hours	0.051	0.013	16.235	<.0001	1.052	1.026	1.079
Salary	-0.015	0.004	14.610	<.0001	0.985	0.977	0.993
Motivations - Vocational identity	-0.016	0.032	0.251	.616	0.984	0.924	1.048
Motivations - Animal orientation	-0.051	0.044	1.371	.242	0.950	0.872	1.035
Motivations - Social purpose	0.244	0.060	16.669	<.0001	1.277	1.135	1.436
Motivations - Career affordances	-0.007	0.050	0.020	.887	0.993	0.900	1.096
Burnout	-0.078	0.032	5.812	.016	0.925	0.868	0.986
Compassion satisfaction	-0.095	0.033	8.44	.004	0.909	0.853	0.970
Job Satisfaction - Work culture	0.001	0.032	0.002	.969	1.001	0.941	1.065
Job Satisfaction - Scheduling	-0.106	0.035	9.023	.003	0.899	0.839	0.964
Job Satisfaction – Collegial Relations	0.124	0.056	4.888	.027	1.133	1.014	1.265
Job Satisfaction - Extrinsic Reward	-0.076	0.070	1.173	.279	1.133	1.014	1.265
Job Satisfaction - Personal satisfaction	-0.125	0.052	5.818	.016	0.883	0.797	0.977
Work-life balance	0.029	0.039	0.560	.454	1.030	0.954	1.111

†Males compared to females
*Reference group

Discussion

The purpose of this study was to analyse the potential contributions of psychological variables suspected to have an association with attrition from veterinary clinical practice. The variables in the model with a negative association with attrition from veterinary clinical practice were found to be: 1) burnout, 2) compassion satisfaction, 3) satisfaction with schedules, and 4) personal satisfaction. Two variables in the model had a positive association with attrition: being motivated by social purpose and satisfaction with collegial relations. In terms of the demographic and working conditions included to account for confounders; associations reported in a previous study were confirmed. Variables associated with attrition from clinical practice included: 1) working in metropolitan practice (in comparison to rural practice), 2) working longer hours, 3) presence of on-call duties, and 4) lower salary. The contributions of those were already reported in a previous study using a larger sample of the same veterinary cohort[7] and also align with the veterinary literature. For example, better schedules and pay have been reported as reasons for retention in UK veterinarians[6]. Furthermore, remuneration and hours of work, and a supportive team represented the main factors for veterinary retention in emergency practice in the US[48]. Overall, the model shows that on-call duties (OR 9.46) had the highest odds for attrition. The following paragraphs discuss the possible contributions of the psychological variables to attrition from veterinary clinical practice.

Motivations

The only motivation factor associated with attrition from clinical practice in the final model was social purpose, defined as the desire to make a worthwhile social contribution[20,64]. Although it was significantly associated with attrition from practice, the odds of this variable were small, with odds for leaving practice increasing 1.28 times per unit in the social purpose score. Motivations and elements of job satisfaction can be consistent[65]. We can expect that veterinarians who are motivated to make a social contribution will be satisfied with aspects of the job that can fulfil said motivation. In clinical practice, veterinarians derive pleasure from work when they are able to help animals, people and their communities or society[31,65-67]. Although this contribution is mostly to individual patients or clients, it elicits the feeling of contributing to a greater cause, helping others, and 'making a difference'[21,65,68]. However, elements in clinical practice that could constrain professionals from providing meaningful care include increased workload (causing increased incidence of medical errors) or client financial constraints (inability to pursue perceived ideal patient care)[69,70] among others. Veterinarians who are highly motivated by social purpose might have a higher desire to leave when faced with such restrictions. Moreover, the focus of most veterinary clinical work is towards individual patients and clients; thus, it can be hypothesised that the sense of social contribution may not be met by clinical work and veterinarians that are motivated by social purpose may wish to be involved in broader community and social matters which may influence their desire to leave clinical practice. Veterinary clinical practice is not the only career path that can fulfill a desire to

give back to society. Social contribution can be fulfilled in other sectors such as healthcare, education and public service. It may also be theorised that a professional may desire to contribute to society in an alternative career. A qualitative Australian study reports that social purpose is one of the most frequently discussed themes in veterinary motivation[20]; therefore, understanding the association between social purpose and attrition is important. Further research evaluating a possible association between elements that reduce perceived patient and client care, the different motivations to be a veterinarian, and turnover intentions would be of value. Other options for further research include assessing whether the implementation of social or community programs in veterinary clinical practice could increase the engagement and retention of veterinarians motivated by social purpose.

Professional quality of life

Only burnout and compassion satisfaction were significant in the model. Both variables in the model showed a negative relationship with attrition, indicating that those who scored higher on compassion satisfaction and burnout had higher odds to remain in clinical practice (or lower odds to have left). Results from veterinarians currently in clinical practice indicated higher compassion satisfaction than former clinicians, and those whose results indicated lower compassion satisfaction had higher odds to have left clinical practice (OR 0.91 $p = 0.004$). These results possibly indicate that veterinarians reporting more pleasure from doing their work well as a helper[34] had higher odds to stay in practice. Results from veterinarians who had left clinical practice indicated higher burnout than those currently in practice. However, all else being equal in the regression model, there was a negative relationship (OR 0.93 $p = 0.016$) between burnout and attrition from practice (lower burnout, higher odds of attrition). This result can seem unexpected since burnout has been often associated with predictors of attrition in other professionals[36,71-73]. Current veterinary clinicians experiencing burnout, high levels of stress[74] and psychological ill-health[23,25,26,75] is consistent with the veterinary literature[25,27,45,76,77]. For example, in a 2018 survey of UK veterinarians, 21% of their respondents were unable to cope with the work stress, and 48% experienced burnout[44]. It is important to acknowledge that the ProQOL measure has been designed to assess Professional Quality of Life at a certain point in time (within 30 days)[34] therefore it is difficult to interpret results relating to responses representing longer periods of time as they could be impacted by affect recall bias[63]. Affect recall bias has been defined as the tendency to underestimate or overestimate past emotional experiences[63]. In our study the potential affect recall bias could have an impact on how the respondents estimate their past emotional experiences in relation to their responses to the survey. Consequently, these results should be interpreted with caution. Taking into account the potential bias and possible measurement error, the findings of this study highlight the need to further explore professional quality of life and the relationship to attrition from veterinary practice.

Stamm defines burnout as a feeling of inefficacy, hopelessness, and the perception that there is *"nothing they can do' to make things better*[34]*'*. Stamm relates burnout to high workloads and poor system functions in the workplace[34]. Positively, there are factors that can influence a *helpers'* work experience and reduce attrition despite experiencing burnout. For example, experiencing compassion satisfaction from the associated feelings that *'their work matters'*[34] could be associated with increased retention despite experiencing burnout, as high satisfaction helps balance the negative effects of working with victims[78]*.* Professionals in the animal health sector can experience compassion satisfaction when they can make a difference to the care of animal patients, human clients and communities[79]. It is possible that the positive feeling of satisfaction is outweighing the negative work elements associated with burnout. On the other hand, burnout is not a predictor for turnover or career attrition in every sector of other professionals. For example, although burnout was a predictor for healthcare staff turnover for primary care clinicians, it was not in other primary care staff[72] nor a predictor for attrition in nursing home personel[80]. The results of the regression model indicated that other moderators for attrition, such as hours of work, presence of after-hours duties, and satisfaction with schedules have a stronger relationship with attrition from practice than burnout in this cohort of veterinary graduates. However, it is also possible that affect recall bias to be associated with asking the cohort of former veterinary clinicians to remember their experiences from when they were in practice, could underestimate their experiences with burnout and overestimate their experiences with compassion satisfaction[63]. It is important to interpret the results with this limitation in mind. Burnout has been associated with psychological ill-health in veterinarians[25]; therefore, implementing strategies to reduce burnout, such as restructuring a poor organisational system or reducing workload[27,34] is essential to the overall well-being of the veterinarian. Furthermore, developing strategies to improve compassion satisfaction in veterinary clinicians could improve retention. Previously reported strategies that could increase compassion satisfaction include opportunities to develop and grow within the workplace[34], experiencing positive outcomes[27], increasing opportunities to make a difference for animal patients[79], and developing empathic communication[33].

Elements of job satisfaction

The latent variable of job satisfaction (as devised by the authors of the measure) assessed components of job satisfaction in medical nurses[41,43]. The sub-scales measured in this study represent discrete factors of the global variable of job satisfaction. Dissatisfaction with schedules and lower personal satisfaction were associated with attrition from veterinary clinical practice. As dissatisfaction with scheduling increased, the odds of leaving clinical practice increased by 10% (OR=0.9, p=0.003). Dissatisfaction with scheduling and working hours has previously been seen as a predictor for attrition in veterinarians[5,7,11,13,48] and reported as a recurrent occupational stressor[81]. For example, emergency veterinarians contemplating leaving emergency practice considered hours and schedules as one of the prime reasons for leaving, and 30% of those who had left emergency medicine reported schedules to be the main reason for doing so[48]. This indicates that hours of work and associated satisfaction with working hours in veterinary clinicians can be a significant predictor for attrition from clinical practice.

Dissatisfaction with hours of work being an influential factor for staff turnover has been reported in medical nurses[52], home-care workers[82], and non-specified private sector professionals[83]. Flexible and modified working hours have been associated with improved retention in medical nurses[91], further research investigating whether these tactics would improve retention in veterinarians is needed to suggest implementation strategies.

Personal satisfaction was another contributor to attrition. The model showed that as personal satisfaction decreased, the odds of leaving clinical practice increased by 12% (OR 0.88 *p*=0.02). Traynor describes this variable as feelings of worthwhile accomplishment that contributes to patient care, use of skill, challenge and quality of work with patients in medical nurses[43]. This component of job satisfaction can be extrapolated to veterinary practice as the enjoyment of the clinical work. Such feelings of accomplishment seem to resemble the positive emotions associated with compassion satisfaction and motivation to help or contribute to society. Using clinical expertise, making a difference for animals, helping people, and achieving positive outcomes were frequent themes in job satisfaction of veterinarians and animal care workers[31,79]. These types of intrinsic satisfaction (satisfaction with the nature of the work itself) have been associated with career longevity (along with work-life balance) in early-career veterinarians[84], and intrinsic enjoyment has been a source of retention in UK farm animal veterinarians[85]. Furthermore, intrinsic motivations, defined as the inherited enjoyment of performing a particular task, has been negatively associated with turnover intentions in multiple other sectors[15,16], including healthcare[17]. In surgical personnel, the intrinsic enjoyment of the clinical work was a key significant predictor of job satisfaction[86], highlighting the importance of this aspect. Personal intrinsic satisfaction with veterinary medicine seems to be a protective factor against attrition in this cohort of veterinarians. Understanding elements that will enhance intrinsic job satisfaction and facilitating those resources becomes important when developing retention strategies for veterinarians in clinical practice. For example, increasing the resources to achieve positive clinical outcomes and interactions with patients, and providing the environment for veterinary clinicians to enhance their use of clinical skills may improve their personal job satisfaction.

Collegial relations (an element of job satisfaction) was positively associated with attrition from practice. Clinicians reporting high satisfaction with collegial relations had higher odds of having left clinical practice (*p*=0.027, OR=1.13). This sub-scale measured opportunities for social contact during and after work, but also included questions about satisfaction with the delivery of care used, opportunities to work in other disciplines and the relationship with physicians, which changed to veterinarians and support staff for our study[41]. Contrastingly, an unfriendly and unsupportive working climate has been associated with attrition and job dissatisfaction in medical nurses[52,86,87]. This construct is described in previous research as experiences of isolation, not feeling well regarded by doctors, and a lack of teamwork, cohesion and support from other staff[52,86,87]. Those elements of dissatisfaction (isolation, lack of teamwork, cohesion etc.) might not have been well captured in this five-item sub-scale evaluating satisfaction with collegial relations (Cronbach alpha 0.68). It is possible that this sub-scale may not accurately measure collegial relations with the same terminology as in other studies associating such

dissatisfaction and attrition. Further studies may require an adaptation of the measure in order to adequately understand the contribution of this construct and attrition of veterinarians in practice.

When all variables were analysed, work culture, moral distress, satisfaction with workload, and work-life balance were not significant contributors to attrition from practice. Perception of low work-life balance, toxic work culture, moral distress and high workload have been related to attrition in medical professionals[50,52,88]. However, for this cohort of veterinary graduates, other variables such as satisfaction with schedules, compassion satisfaction, and employment conditions like salary and hours of work had a stronger relationship with attrition. It is possible that variables like work culture, moral distress, WLB, and workload can be an undercurrent of job dissatisfaction but are not directly linked to attrition in this cohort of veterinary clinicians. In Australian small animal veterinarians, workload was associated with work-related stress[87]. Further research is needed to understand these relationships. It is possible that the adapted job satisfaction measure constructed for medical nurses does not correctly evaluate the specific factors that increase workload in clinical veterinarians. Factors such as number of consultations and surgical procedures were associated with work-related stress in small animal veterinarians[75]; though the measure does not assess these, highlighting the importance of developing a veterinary specific job satisfaction scale.

Overall, this study displays factors associated with attrition from clinical practice in veterinarians and offers valuable contributions to the modern veterinary profession. The relationship between dissatisfaction with schedules and odds of attrition adds to previous findings (chapter 4) where more working hours increased odds of attrition[7]. The relationship between compassion satisfaction, being motivated by social purpose, and personal (intrinsic) satisfaction shows the strong interest of veterinarians to do meaningful work and how, when constraints prevent accomplishing such meaningful work, an increase in clinical attrition might be observed. Further research is required to understand better the relationship between burnout, satisfaction with collegial relations, work-life balance, workload, and moral distress and with veterinary attrition from practice.

Limitations

The limitations of this study include the possibility of recollection, selection and imputation bias. There was no cut off for time of attrition, which could be associated with recollection bias for veterinarians that have left practice several years ago[63]. Recollection bias might have affected results obtained from some of the measures. The ProQOL, for example, was designed to measure compassion satisfaction and compassion fatigue in a period of 30 days prior to administration[34]. The potential for affect recall bias may affect the accuracy of the results when recollecting feelings and experiences from periods beyond 30 days[63]. Potter indicated that the measure is better used when trends are evaluated over time[89], and Stamm the creator of ProQOL, reports that changes over time can occur[34]. This study could not assess such trends and changes due to its cross-sectional design and

methodology and an interpretation of the mental health of veterinarians over the course of their careers cannot be extrapolated[90]. A longitudinal study could yield different results. Furthermore, the ProQOL measure is designed for those who care/help other people, but it is not specific for animal carers. Although we tried to adjust the statements to veterinary practice as much as possible without taking away the meaning of the item, there were elements relating to caring for animals that might not be captured in the ProQOL[33]. It is possible that the ProQOL can underrepresent the professional satisfaction of veterinary clinicians. Validating a veterinary specific professional quality of life measure may be useful to further understand the relationship between these variables and attrition from veterinary clinical practice. The results elicited from the use of this measure should be interpreted in the light of its limitations and may be useful as possible indicators for future research.

Unfortunately, the measure of job satisfaction had to have some data imputed to meet the ethical approval requirement to allow participants to skip questions leading to possible imputation bias which could elicit inaccurate representation of the estimated values[92]. Imputation bias was minimised by recognising a missingness pattern in the data set which increases our confidence of an adequate representation of the estimated values[92]. Furthermore, as there is no job satisfaction measure for veterinarians, some veterinary-specific situations were not included in this attrition assessment, such as financial constraints of clients and job satisfaction surrounding animal euthanasia. Furthermore, the sub-scale evaluating collegial relations might not have captured elements of teamwork, support, and collegiality reportedly related to attrition in medical nurses. This created difficulties with interpretating results surrounding this construct. Moral distress was assessed using a recently developed measure that uses a '0' for 'not applicable', which could reduce the overall scores of the scale, possibly under-reporting moral distress in this cohort. The moral distress measure was developed using the same dataset analysed in the current manuscript, without using a different population to validate the scale. Further research to validate the moral distress scale is needed and measuring a moral distress in a different population may yield a different relationship between moral distress and attrition from practice.

This research reports the results of a cross-sectional study; therefore, causality cannot be determined. The results observed are potentially indicative of possible relationships and associations only. Data was acquired mainly via electronic dissemination using alumni offices and social media, which may exclude veterinarians without access to these platforms. The authors tried to minimise selection bias by using veterinary alumni offices, however, it is possible that the cohort of former veterinary clinicians may be under represented.

Conclusion

Employment conditions such as lower salary, working longer hours, working in metropolitan regions, and being on-call were associated with attrition from veterinary clinical practice, even when the analysis included the psychological factors. Addressing these working conditions is important when developing staff retention

strategies. Furthermore, being motivated by social purpose and dissatisfaction with scheduling were influential factors for attrition from clinical practice. It is possible that compassion satisfaction and intrinsic personal satisfaction might be protective against attrition from practice but further research is required due to the limitations of the use of the measure to investigate compassion satisfaction. Dissatisfaction with scheduling can be closely related to working hours, and these factors in unity were associated with attrition from practice. Results from clinicians reporting lower burnout indicated higher odds to have left clinical practice, which may possibly be associated with a decision of current clinicians to stay despite experiencing burnout. However, it is possible that the experience of burnout in former veterinary clinicians could be underrepresented since the ProQOL was not designed to measure this variable in a prolonged retrospection. Further research is required to comprehensively understand the relationship between burnout and attrition in veterinarians.

Creating contextualised measures for job satisfaction and professional quality of life that include the circumstances unique to veterinarians, instead of adapting measures from other caring professions, can be important areas of future research. Finally, providing an environment that can enhance the sources of personal satisfaction and compassion satisfaction (such as resources to increase positive clinical outcomes and patient and client care) is a strategy that may potentially increase the retention of veterinarians in practice.

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Supplementary materials

Survey psychological variables

The questions were worded in present tense for current veterinary clinicians.
The questions were worded in past tense when presented to former veterinary clinicians and were introduced by 'Thinking back to your time as a veterinary clinician…'

Motivations:
To what extent do you agree with the following statements:
I was motivated to be a veterinary clinician because…
5 point likert – scale from: 1: not at all like me, 2: rarely like me, 3: sometimes like me, 4: often like me, 5: very much like me

1. I've always wanted to be a veterinarian
2. It was a childhood dream to become a veterinarian
3. Being a veterinarian is all I've ever wanted to be
4. I like the challenge of veterinary work
5. I like learning new things
6. I like solving problems
7. I like the variety of veterinary work
8. I like working with animals
9. I want to help animals
10. I like interacting with animals
11. I love animals
12. I want to prevent animal suffering
13. I like working with people
14. I like interacting with clients
15. I want to help people
16. I want to contribute to society
17. I can make a difference to society
18. I can contribute to the community
19. It provides a decent income
20. It is a respected profession
21. There are lots of career opportunities as a veterinarian
22. It offers job security

Professional quality of life
Thinking back to your time as a veterinary clinician how often did you experience the following?
5 point Likert Scale from never to very often

1- I was happy as a veterinarian
2- I was preoccupied with more than one person or patient I helped
3- I got satisfaction from being able to help others
4- I felt connected to others
5- I used to jump or be startled by unexpected sounds
6- I felt invigorated after working with those I help
7- I found it difficult to separate my personal life from my life as a veterinarian

8- I was not as productive at work because I was losing sleep over traumatic experiences as a veterinarian
9- I think that I might have been affected by the traumatic stress of those I used to help
10- I felt trapped by my job as a vet
11- Because of my job, I have felt 'on edge' about various things
12- I liked my work as a vet
13- I felt depressed because of the traumatic experiences of the people I helped
14- I felt as though I was experiencing the trauma of someone I have helped
15- I have beliefs that sustain me
16- I am pleased with how I was able to keep up with veterinary techniques and protocols
17- I was the person I always wanted to be
18- My work made me feel satisfied
19- I felt worn out because of my work as a vet
20- I had happy thoughts and feelings about people I helped and how I could help them further
21- I felt overwhelmed because my workload seemed endless
22- I believe I was able to make a difference through my work
23- I avoided certain activities or situations because they remind me of frightening experiences of those I helped
24- I was proud of what I could do to help
25- As a result of being a vet, I used to have intrusive, frightening thoughts
26- I felt 'bogged down' by the system
27- I had thoughts that I was a 'success' as a vet
28- I couldn't recall important parts of my work with patients
29- I am a very caring person
30- I am happy that I chose to do veterinary work

Job Satisfaction

Thinking back to your work as a veterinary clinician, on average. To what extent were you satisfied or dissatisfied with the following items?
5 point Likert scale from very dissatisfied to very satisfied.

1- Encouragement and positive feedback
2- Recognition of your work from your superiors
3- Recognition of your work from peers
4- Participation in decision – making in your workplace
5- Control over your work setting
6- Control over your work conditions
7- Your immediate supervisor
8- Weekends off per month
9- Flexibility in scheduling weekends off
10- Opportunity to work consecutive days
11- Flexibility in scheduling hours
12- Compensation for working weekends
13- Hours that you work
14- Parental leave time
15- Opportunity for part time work
16- Opportunities for social contact at work
17- Opportunities for social contact after work
18- Delivery of the care method you use

19- Opportunity to work with other disciplines
20- The other veterinarians and support staff you work with
21- Benefits package
22- Salary
23- Vacation
24- The time available to get through your work
25- The amount of time available to finish everything you have to do
26- The time available for patient care
27- Your workload
28- Overall staffing levels
29- The feeling of worthwhile accomplishment you get from your work
30- The extent to which you can use my skills
31- The contribution you make to patient care
32- The amount of challenge in your job
33- The extent to which your job is varied and interesting

Moral Distress Scale for Veterinarians (MDS-V)

As a veterinary clinician**.** In relation to the following situations, how often did they occur and how distressing did you find them?
Only the items pertinent to the MDS-V were evaluated to assess the relationship between MD and attrition from veterinary clinical practice

5-point Likert scale from:
0 = Not applicable
1= Never / not distressing
2= Occasionally / slightly distressing
3= Frequently / distressing
4= Very frequently / 'very distressing

1. Participate on a team that gives inconsistent messages to clients
2. Experiencing lack of administrative action or support for a problem that is compromising patient and/or client care
3. Working within power hierarchies in teams, units and in my practice (or institution) that compromise patient and/or client care
4. Witnessing low quality of patient and client care due to poor team communication
5. Being required to care for patients who have inconsistent or unclear treatment plans or who lack goals of care
6. Assisting other veterinarians who were providing incompetent care
7. Working in a situation where the client would not pay for the recommended treatment
8. Being unable to provide optimal care due to pressures from clients to reduce costs
9. Carrying out the client's wishes that were not in the best interest of the patient
10. Performing euthanasia for reasons I do not agree with
11. Being required to work with abusive clients
12. Continue providing aggressive treatment to a patient who is most likely to die regardless of this treatment
13. Participate in care and procedures I do not agree with, but doing so because of fears of being fired
14. Witness a violation of standard of practice or code of ethics and do not feel sufficiently supported to report the violation

15. Feel the pressure to order or carry out orders for what I consider to be unnecessary or inappropriate tests and treatments
16. Participate in care and procedures I do not agree with, but doing so because of fears of litigation or complaints

Work-Life Balance

When I reflect over my work as a veterinary clinician and non-work activities (your regular activities outside of work such as family, friends, sports, study etc.) when I was working as a veterinary clinician, I conclude that:
5 point Likert scale from strongly disagree to strongly agree

1- I had a good balance between the time I spent at work and the time I had available for non-work activities.
2- I had difficulty balancing my work and non-work activities
3- I felt that the balance between my work demands and non-work activities was about right
4- Overall, I believe that my work and non-work life were balanced.

Chapter 7: Thesis discussion

Overview

Overall, this research indicates that certain psychological variables are potentially associated with attrition from veterinary clinical practice. Further research is required to confirm these relationships. This thesis, however, sets the groundwork for further investigation on these psychological variables. Variables potentially associated with attrition from veterinary clinical practice included low compassion satisfaction, low burnout, dissatisfaction with schedules, being motivated by social purpose, higher satisfaction with collegial relations, and lower personal (intrinsic) satisfaction. Moral distress was not found to have a potential relationship with attrition from veterinary practice in this cohort of veterinary graduates. Although not without limitations, the results from chapter 6 illuminate important areas potentially associated with attrition from veterinary clinical practice. The final chapter of this dissertation aims to discuss the combined empirical results from chapters 2 to 6.

Veterinarians are essential for the community and the welfare of animals. Currently, there are suspected worldwide shortages of veterinary clinicians, which is thought to be the result of attrition from veterinary clinical practice. Although there are publications on attrition from veterinarians in rural or farm animal veterinary practice[1-3], intention to leave the profession[4,5], and staff turnover[6], there is a gap in the literature concerning attrition from clinical practice overall. In Australia, the Australian Veterinary Association (AVA) has reported an increase of 6% in intention to leave veterinary work from 2016 to 2018[5,7]. However, data acquired from the AVA workforce survey is not peer reviewed, and pertains to veterinarians leaving the profession not just clinical practice. More closely related to leaving clinical practice but only reporting intention to leave, a 2015 US survey reports that 13% of their respondents were considering leaving veterinary practice[8]. A problem of this magnitude is difficult to ignore, and demands research into the reasons for attrition.

Moral distress is a phenomenon that has been linked to staff turnover in healthcare professionals and is related to psychological anguish, job dissatisfaction, and low morale[9-17]. However, moral distress has received limited study in veterinary sciences, and the relationship between moral distress and attrition in veterinarians is unknown. This project sought to understand the reasons for attrition in veterinary clinical practice and the influence of moral distress. To achieve this goal, a deeper qualitative investigation on why veterinarians stop working in clinical practice was performed. This deeper investigation involves understanding the circumstances that might surround the decision-making process to leave clinical practice. Based on those results, a survey was developed to get a broader understanding of attrition in a larger cohort of veterinary clinicians. To understand moral distress and its contribution to attrition from clinical practice, a review of the literature was conducted, followed by the development of a moral distress scale to measure this phenomenon in veterinarians. Finally, moral distress and other theorised personal and work-related factors were investigated in a population of current

and former veterinary clinicians to determine their possible contributions to attrition from veterinary clinical practice. The following chapter will discuss the key findings and integrated results of the studies performed.

Summary of findings

Moral distress. Definitions and the moral deliberation pathway

Due to the limited understanding of moral distress in veterinarians, the dissertation's second chapter sought to understand moral distress by reviewing the related literature. Moral distress was defined as the psychological anguish that occurs when a professional cannot undergo what they consider to be the correct moral path[18,19]. A moral conflict was defined as a situation that is perceived to conflict with the professionals' personal values, and moral stress was defined as the stress associated with experiencing a moral conflict[20-22]. From this, a moral deliberation model was developed. The model indicated that moral distress occurs when modifying factors (such as personal background and personality) influence the perception of a situation as a moral conflict. Once a moral conflict occurs, the professional experiences moral stress. Following this (and also influenced by modifying factors), they experience one of two outcomes: 1) moral comfort, if the conflict has a positive resolution or 2) moral distress if psychological anguish occurs. Moral distress occurs in veterinary clinicians, and (just like in medical professionals) it can have deleterious effects on the mental health of the veterinarian experiencing it[20,23-26]. This review assisted us to have a better definition and understanding of moral distress in the veterinary profession.

Moral distress has been established as an influential factor in staff turnover in medical professionals[13-16]; however, there has been no research evaluating the influence of moral distress in veterinary clinical attrition. A better understanding of moral distress in veterinarians facilitates this necessary research. Additionally, the reasons for veterinary clinical attrition are yet to be explored in depth. It was decided to investigate the reasons for attrition in veterinarians first then observe whether moral distress (or conflict) was a contributing factor.

Interviewing former veterinary clinicians. A qualitative analysis on why they left practice

A qualitative approach was used to understand the contextualised subjective experiences[27-29] of veterinarians who had left clinical practice. Interviews with 26 former veterinary clinicians asked them to describe their experiences as clinicians and why they left practice. Two main themes emerged: Personal Factors and Work Experiences, each with several sub-themes. Furthermore, the two themes interacted with each other. For example, alternative professional interest emerged as a sub-theme in Personal Factors. However, the participants often compared conditions such as hours of work and pay (Work experiences) at their chosen alternative profession with their former employment conditions as a clinician when discussing why they left practice. Moral distress featured as a sub-category within Work Experiences.

The first study highlighted that no single factor influenced attrition from veterinary clinical practice. Retention strategies, therefore, need to be multimodal, addressing both personal and work-related factors. This chapter establishes the relationship between work-related and personal factors and how they affect the veterinarian and their desire to leave clinical practice. This structural framework was used to develop a survey that explored these factors in a larger population.

Risk factors possibly contributing to veterinary clinical attrition
Part one: The influence of demographics and working conditions

An exploration of the interconnected factors that led to attrition from clinical practice provided the foundations to understand clinical attrition in veterinarians. Further research was needed to assess which factors emerging from the qualitative study were more closely associated with attrition. A survey investigating demographics, work-related factors, and psychological variables was distributed to current and former veterinary clinicians. The initial part of the analysis (chapter 4) focused on demographic factors and the following working conditions: region of work, being an employer or employee, field of work, salary, working hours, having an alternative professional interest, university of graduation, being investigated by a regulatory authority, and years of experience. By using a logistic regression model, it was possible to identify that working longer hours, having on-call duties, getting lower pay, being male, and working in metropolitan areas were associated with attrition from practice. Working in 'other' clinical fields was associated with retention. This result was difficult to interpret as the category of 'other' encompassed several different sub-categories. Following the evaluation of demographic and employment-related factors we investigated potential associations of the psychological variables that emerged during the interviews with former veterinary clinicians with attrition from clinical practice including moral distress. However, to properly evaluate moral distress, the development of a moral distress measure for veterinary clinicians was needed.

Understanding and measuring moral distress in veterinary clinicians

Moral distress in veterinarians was further explored by using a mixed-methods approach. The themes emerging from the interviews in chapter 5 aligned with the moral deliberation pathway proposed in chapter 2. Other relationships were identified between modifying factors and moral conflicts, including whether the participant perceived a situation as a moral conflict or not. The second qualitative part of this chapter analyses the free-text responses to whether there were other moral or ethical conflicts the respondents encountered during veterinary clinical practice. Two themes emerged: Animal health and Human interactions. Participants described expected conflicts such as euthanasia, negative colleague interactions, pressures to increase financial gain, the inability of clients to afford veterinary care, and lack of support from the system. Some categories unidentified in literature

arose as moral conflicts, such as client care (independently from the animal patient) and employment conditions like having to work when fatigued or earning a lower income.

An exploratory principal component analysis and a confirmatory factor analysis were performed, and the moral distress scale for veterinarians (MDS-V) was developed. The MDS-V has three sub-scales demonstrating different areas of moral conflict in veterinary clinicians: Team relations compromising patient care; Conflicting client interactions; and Perception of personal threat. Although requiring validation in different populations of veterinarians, this scale can be used to measure moral distress in veterinary clinicians and to assess the relationship between moral distress and attrition from veterinary clinical practice.

Risk factors possibly contributing to veterinary clinical attrition
Part two: Evaluation of psychometric variables including moral distress

As seen in chapter 3, a combination of interlinked factors influenced veterinary clinical attrition. It was necessary to assess how these factors relate to attrition in the presence of each other rather than assessing their individual contributions. The variables assessed through a regression model were selected based on the interviewees' responses in chapter 3. In chapter 6 possible relationships between attrition from veterinary clinical practice and: motivations to be a veterinarian, professional quality of life, elements of job satisfaction (satisfaction with: work culture, work schedules, workload, collegial relations, remuneration, personal satisfaction), work-life balance, and moral distress. In addition to those psychological factors, the demographic and work-related variables associated with attrition in chapter 4 were included to account for possible confounders.

The logistic regression model indicated that some psychological variables had a positive association with attrition while others had a negative association. All else being equal, variables in the model positively associated with attrition (higher scores increase the odds of attrition) were: being motivated by social purpose and being satisfied with collegial relations. Variables in the model that were negatively associated with attrition (lower scores increase the odds of attrition) included: compassion satisfaction, burnout, satisfaction with scheduling, and personal (intrinsic) job satisfaction. The conclusions relate to possible indications of a protective effect of compassion satisfaction and personal (worthwhile accomplishments related to their clinical work[85]) job satisfaction from veterinary clinicians' attrition from practice. It is possible that satisfaction with the work itself may have a stronger pull to retention than burnout might have towards attrition. However, due to the limitations on the retrospective use of the ProQOL in former veterinary clinicians that have left clinical practice potentially a long time ago, these results should be used as possible indicators for future research only. Other variables theorised to be associated with attrition from practice, which yielded non-significant results, included work-life balance, dissatisfaction with workload and moral distress. This final study completed the investigation of reasons for attrition from veterinary clinical practice and the influence of moral distress.

Integrated assessment of findings

The combination of factors

One of the main findings of chapter 2 was that a combination of personal and work-related factors influenced the veterinarian's decision to leave clinical practice. The participants' perceptions of values and background influenced how they approached their clinical work, and their experiences at work influenced their emotions and further motivations. Ultimately, the combination of these influenced their decision to leave practice. The risk factors for attrition were, therefore, analysed in light of each other rather than as individual variables. This method was used for the demographic elements and working conditions in chapter 4 and the investigation of psychological variables in chapter 6.

Although several previous studies have discussed attrition in veterinarians[1,2,6,30,31], they focused on demographics, a particular field of work, staff turnover, or leaving the veterinary profession overall. Since the results of the qualitative exploration revealed that a combination of factors was involved in attrition from practice, it was necessary to account for possible psychological factors with the inclusion of moral distress. This research is in line with workforce literature reporting the influence of multiple factors on turnover intentions, staff turnover or career attrition in teachers[32,33], and medical nurses[16,34], and finds that multiple factors including personal (non-work related) and employment-related factors are associated with veterinary clinical attrition.

Demographic factors: gender, region of work and working in 'other' clinical fields.

Previous workforce studies in the veterinary literature have focused on demographics and extrinsic working conditions. Understanding the contrasts between the findings in this dissertation and the previously published literature is important. For example, a discrepancy was noted regarding gender. Female veterinarians are reported to have higher intention to leave practice when compared with males[31]. In contrast, results in chapter 4 indicate that, for this cohort, male veterinarians had higher odds to have left practice than females. However, when the psychological variables were added to the model in chapter 6, the influence of gender was no longer significant. Furthermore, other veterinary studies found no link between gender and veterinarians leaving farm animal practice[35] or veterinary academia[36]. The overarching conclusion is that the influence of gender in veterinary workforce fluctuations might be cohort dependent. Future studies will be required if further focus on this particular demographic is desired.

Another relevant demographic is region of work. Several studies have addressed the perceived veterinary workforce shortage in rural veterinary practice[1-3,35,37-39]. However, this study showed that more metropolitan veterinarians tended to leave than rural or semi-rural ones. This result was consistent in chapter 6, even when

the model included the psychological variables. Furthermore, veterinarians who had worked both in metropolitan and rural regions had higher odds to have left practice than their metropolitan colleagues; although when the psychometrics were included in the model, this variable was no longer significant. To this date, there have been no publications exploring the influence of specific working regions on staff turnover or career attrition in veterinarians. The results in this thesis are novel and lead the way to further detailed research to understand the particular challenges that metropolitan veterinarians may be facing in contrast to their rural counterparts. It is possible, for example, that veterinarians in metropolitan regions may have more consultations, perform more surgery, and have less time per patient, which is a notable contributor to work-related stress in companion animal veterinarians[40]. On the other hand, sources of job satisfaction in rural veterinary practice (such as community involvement and working outdoors[3,35]) could have a stronger pull for retention for these veterinarians. This pull is seen in Australian healthcare, where general practitioners in rural regions showed higher job satisfaction than their urban counterparts[41]. Finally, a study with a small cohort of Charles Sturt University veterinary graduates reported that regional veterinarians could be receiving higher salaries than their metropolitan colleagues[42]. Considering salary is an important moderator for attrition, the higher salary received by regional veterinarians could act as a retention incentive. A comparison between the two groups is needed to assess this theory. In the meantime, strategies for retention for all regions should be considered.

No significant differences in relation to attrition from practice were found between small animal and mixed practice veterinarians. The field of work that grouped several sub-sectors, such as specialist practice, shelter medicine, wildlife and zoo veterinarians, and clinical government veterinarians (named 'Other'), seemed to be protective against attrition from practice. This result was seen both in chapter 4 and chapter 6. It is difficult to accurately explain this finding since it was not feasible to separate these smaller fields of work for individual analysis; however, future research may find that working in a specialist or niche field of practice could be protective from career attrition. In medical doctors, specialty surgeons (eg. cardiovascular, orthopaedic) tend to have higher job satisfaction than general surgeons[43] thus this could be a valid theory that requires more investigation. A qualitative study exploring the professional identity of newly graduated veterinarians found that participants who had a diagnosis-focused identity (satisfaction and value placed in the diagnosis and treatment of patients) might find some challenges of general veterinary practice frustrating[44]. It was hypothesised that such frustrations could be alleviated in a setting where clients have similar values and expectations, such as referral specialist practice[44]. This type of job satisfaction could contribute to retention, but further research is required to test this hypothesis since other studies in the veterinary literature indicate that attrition from practice and staff turnover also occurs in different specialty fields of practice like diagnostic imaging[45] and academia[36]. Therefore, a potential causal relationship between working in a specialty field and career longevity in veterinary practice needs further exploration. As expected, salary, hours of work and being on-call were still significant aspects of attrition from practice. These variables will be discussed in the following section.

Important working conditions: Hours, after-hours and salary

Hours of work, presence of after-hours duties and dissatisfaction with schedules were key findings in both the qualitative and quantitative studies. These findings are similar to those found in the literature. For example, in rural veterinary practice, lack of time off and presence of emergency duties were highly ranked as reasons for veterinarians to leave rural veterinary practice[1]. Hours of work, lack of breaks, not having enough holidays and long working days were associated with work-related stress in Queensland veterinarians[46]. A common suggestion has been to increase flexibility in schedules and working hours[30,31,47,48]. Although some veterinarians do reduce the number of hours they work[47], recently graduated veterinarians seem to be working significantly more hours per week[49]. In New Zealand, it was reported that the median working week for recent graduate veterinarians was 48.7 hours[49], and in Australia, the mean working hours for veterinarians was 40 hours per week[5]. Similarly, veterinary clinicians worked the longest hours in the UK, averaging 44.3 hours per week in 2014[48]. In chapter 6 of this dissertation, the mean of hours of work per week (for both current and former veterinary clinicians) was 39 hours. Fair Work Australia considers 38 hours per week to be the full-time working week in Australia[50]; hence, veterinarians on average, seem to be working more.

Besides dissatisfaction with long working hours, there seems to be an association between longer hours of work and psychological stress. Overwork and long working hours in healthcare and veterinary professionals have a relationship with psychological stress[40,51-53] and increased incidences of medical and 'everyday life' errors[54]. Furthermore, working longer hours in a stressful environment is associated with higher fatigue levels than working longer hours in a non-stressful environment[51]. With that in mind, chapter 6 shows a relationship between dissatisfaction with work hours and schedules and attrition from practice. Together, these factors indicate that overall hours of work is a critical factor influencing attrition from veterinary clinical practice. It is suggested that reducing working hours and increasing flexibility could increase the retention and attraction of veterinarians to clinical practice. Contrastingly, it has been suggested that a veterinarians' capability to embrace long working hours is associated with retention[31]. Considering the results of chapter 3 (where combined personal and work-related factors influence attrition), the possibility that the acceptance and embracement of long working hours highlights the role of personal predisposition and beliefs around the perception of work associated with retention. The total number of working hours and dissatisfaction with them was not the only scheduling variables associated with attrition. On call duties were found to have a strong link with attrition.

Having on-call duties increased the odds of attrition from clinical practice nine times in chapter 6 (when the psychological variables were included) and ten times in chapter 4. Working after-hours and presence of emergency duties has been recurrently reported in the literature as a reason for veterinarians to leave their chosen field of work, like rural veterinary practice[1]. Furthermore, the association between after-hours, poor wellbeing and fatigue is worth recognising. Fatigue was also a sub-theme in chapter 3, where several of the

former clinicians interviewed reported the feeling of exhaustion from being on-call and the lack of opportunity for rest after a night on-call. Being on-call was also seen as an imposition in the interviewees' work-life/family balance, which is consistent with the literature[1]. A similar explanation was found in US and UK veterinary clinicians where after-hours duties (on-call) correlated with attrition from rural veterinary practice[1,2]. Addressing the on-call issue is key to reducing fatigue, improving WLB and consequently, retention of veterinary clinicians. Strategies to manage fatigue include 'flexibility of schedules' and reducing frequency of on-call are often proposed. However, implementation of these strategies and meet the needs of the community, maintain the welfare of animals and the business profitability of the practice is more complex. We propose reducing the frequency of on-call duties as a retention strategy. This could be achieved by sharing after-hours with neighboring clinics; however, further research is needed to assess whether this intervention is viable or helpful. Alternatively, ensuring time off after a night on-call could also reduce fatigue and exhaustion. The details for implementing these strategies require further exploration and consultation with the stakeholders involved.

Another working condition that seems to have a recurrent association with staff turnover and attrition from practice is salary. The association between remuneration and veterinary workforce has previously been explored. In the UK, most surveyed veterinarians in a 2014 study reported that better remuneration would improve the profession[48], and in North America, authors recommend increasing salaries for veterinarians as a strategy for recruitment and retention[37,47]. In Australia, Professional Scientists Australia report that veterinarians in 2017 earned approximately 10% less than the average professional with an average wage of $A72,940[55]. Increasing wages in mixed animal practice was recommended in a 2011 Queensland report after surveying the expectations of salary in veterinary students[56]. In chapter 4, we found in our data description that the average wage for current veterinary clinicians was $A88.9k, and $74.6k for former clinicians. Currently, information on veterinarians' wages is based on cross-sectional surveys of current working veterinarians or economic reports from private enterprises. Until now, wages between former and current veterinarians in practice had not been compared. This research provides an important contribution to the literature showing lower veterinary salaries (adjusted for inflation) in former veterinary clinicians in comparison to current ones and a significant association with attrition from practice.

The current system of private veterinary practice relies on providing services for a fee. Therefore, the sustainability and profitability (and consequently, the potential salaries of veterinarians) depend on clients' ability to pay for services. This was identified when discussing retention strategies to retain veterinarians in rural practice[37]. Rural veterinarians describe their clients' inability or unwillingness to pay for veterinary services and phone consultations. They report that clients use 'the guilt card' to coerce veterinarians into providing services for free or at low cost, which in turn generates a negative emotional state in the veterinarian[37]. The solution seems simple: increasing the profitability of the practices would incur an increase in salary for veterinarians. However, two problems could arise: 1) client expenditure for veterinary services increases but veterinary wages

do not[55] indicating that despite practice profitability, there might not be a correlation between practice profits and wage growth; 2) inability, unwillingness or struggles for clients to pay their veterinary bills[57,58], including the perception that veterinary services are of low value and high cost[59]. The latter may lead to other issues (such as euthanasia of animals for economic reasons), which can instigate moral distress[22,26] and other emotional demands for clinical veterinarians[58,60]. Other issues with increasing profitability include the monopolistic nature of veterinary business possibly contributing to the market inefficiency[57] and the reported lack of experience of veterinarians to accurately communicate their expertise[59].

Strategies to improve profitability and remuneration for veterinarians have been recommended. For example, recommendations of increasing early career business skills in veterinarian practice have been followed with recent veterinary graduates through university education[61]. Although working conditions such as pay have been associated with job satisfaction (and consequently) retention, the relationship may only be marginal as found in a meta-analysis of employees in multiple sectors[62], and other factors (more intrinsic in nature) are important contributors to attrition and retention of veterinarians in practice.

A negative emotional state and burnout

Affectivity, described as a positive or negative emotional state[63], was a recurrent theme arising in chapter 3 for 24 out of the 26 interviewees. There is a wide breadth of research related to the negative emotional state expressed as occupational stress, burnout and mental ill-health in veterinarians[8,40,64,65]. The recurrent expression of negative thoughts and negative affectivity as an influential factor for attrition in this cohort concurs with the cited literature. Negative affect seemed to interlink with work-related factors such as working long hours and presence of on-call. Some participants in the interviews associated this interaction with work-family/life balance and work-related stressors. Although affectivity itself was not measured in the quantitative studies, aspects associated with trauma, stress and emotional exhaustion (compassion fatigue)[66] as well as compassion satisfaction were investigated by measuring professional quality of life (ProQOL)[66].

The results of Chapter 6 possibly indicate that potential relationships may exist for attrition from clinical practice and burnout and compassion satisfaction. Results of the logistic regression model indicated that former veterinary clinicians reported lower compassion satisfaction and that these results were associated with higher odds of attrition. Although results of the model indicated that former veterinary clinicians reported higher burnout, this variable in the model had a negative relationship with attrition from practice. This result possibly indicates a potential relationship between burnout and attrition from clinical practice that is contrary to previous findings where, for example, emergency clinicians that indicated intention to leave were experiencing self-reported burnout[30]. However, this study in emergency clinicians did not measure burnout and reports only the respondents' self-assessment of their own definition of burnout. Other studies have measured burnout in animal

care staff[67,68], veterinarians[68,69], and veterinary students[70], but the association between burnout and intention to leave or career attrition has not been measured in veterinary practice. It is also possible that although burnout seems to be prevalent in veterinarians (up to 50% of recently graduate veterinarians may reach a stage of burnout[65]), it may not necessarily relate to attrition from practice. Other aspects that increase retention may have a more substantial influence. However, it is also important to acknowledge the challenge of interpreting results associated with the ProQOL as the measure is intended to assess a professional's emotional state within 30 days and this study has not used the measure in this form. The results of this study give possible indications for future research investigating potential relationships between professional quality of life and career attrition and/or staff turnover.

High burnout, job satisfaction and compassion satisfaction can coexist[66,71,72]. In child care workers, this relationship is highly moderated with the meaningfulness and satisfaction derived from helping others[71]. Other factors associated with high job satisfaction (despite emotional exhaustion or burnout) mentioned in the literature are social support, workload, job autonomy, and personal attributes such as skill level and coping strategies[71]. Veterinarians experience burnout[69,73] and compassion satisfaction[69] which is not unprecedented. The dual duty of caring for both people and animals (and potentially arising conflicts) may contribute to a greater likelihood of experiencing both compassion satisfaction and compassion fatigue[74]. The following section discusses the possible factors associated with satisfaction in veterinary clinical practice.

Motivations and job satisfaction

Matching motivations to work and reality of the job have been linked to improved job satisfaction[75,76]. The relevance for this thesis revolves around the relationship between motivations, job dissatisfaction and staff turnover[43,77-81]. Motivations to work is often related to personal values, background and beliefs. This interlink and its influence on attrition was discussed in chapter 3. Furthermore, it is possible to measure motivations in veterinarians[76]. In this dissertation, motivations to be a veterinarian were measured and compared to attrition from clinical practice. Chapter 6 showed that the only motivation associated with attrition from clinical practice was social purpose. As per the discussion in chapter 6, a professional may choose to fulfill this type of vocational need in alternative careers which make a stronger contribution to the wider community. Other motivation factors such as caring for animals, vocational identity and extrinsic reward did not show a relationship with attrition in this study. A hypothesis could be developed which indicates that either these motivations are being met in clinical practice or that veterinarians are staying in practice despite not having these motivations met. It can also be hypothesised that when experiences in veterinary practice match the motivations of veterinary professionals, career longevity is attainable. However, a better understanding of the relationships between these motivation factors and attrition requires further research.

Job satisfaction is an important concept due to its relationship with attrition and employee turnover in other professionals[43,77,80], its relationship with professional engagement[83,84], quality of patient care[85], and psychological wellbeing[82,83]. Some elements challenge achieving satisfaction in veterinary practice. Armitage-Chan describes the frustration with limitations (such as client finances) that preclude achieving diagnosis and treatment for patients in a qualitative study of recently graduated veterinarians[44]. That cohort reported satisfaction not only when they were able to diagnose and treat but also when they could care for clients or overcome challenges[44]. Other reported sources of job satisfaction include the ability to use clinical expertise, positive clinical outcomes, positive client and inter-collegial relations, and the perception of helping[84]. However, most literature has either been qualitative narrative and thematic analysis, or descriptive quantitative research. To this date, there are no validated scales to measure job satisfaction in veterinary clinical practice. We measured elements of job satisfaction and assessed their contribution to attrition from practice in chapter 6. The results show that dissatisfaction with intrinsic reward (personal satisfaction), which relates to the satisfaction and feelings of accomplishment of the work itself[85], was significantly associated with attrition.

Similarly, to intrinsic satisfaction, compassion satisfaction is defined as the pleasure derived from helping others and doing the work well[66]. The indication of a possible relationship between compassion satisfaction and attrition from practice was expected: lower compassion satisfaction in the regression model was associated with higher odds of attrition from practice. Similarly, to medical nurses, increasing compassion satisfaction could be important for retention[86]. In chapter 6, for example, veterinarians with higher social purpose motivations and those with more personal dissatisfaction had higher odds to have left clinical practice. It was established earlier that social purpose indicated motivations towards making an impact or contribution to a community or society[87,88]. Similarly, compassion satisfaction and the job satisfaction sub-scale associated with personal satisfaction are also associated with feelings of accomplishment in relation to caring (for patients)[85]. Such meaningfulness of caring for patients has been associated with job satisfaction in healthcare professionals, including doctors and nurses[43]. Integrating these findings and the results associated with motivations and job satisfaction from intrinsic/personal achievement is valuable as we have established (in chapter 3) that it is a combination of factors that ultimately influences attrition. However, further research is required to assess the potential associations between the combination of the variables and attrition rather than their individual contributions.

The commonality between these variables demonstrates the desire of veterinary clinicians to make a difference and successfully care for patients. Caring for patients and clients is an element of job satisfaction in veterinarians, veterinary students and veterinary support staff[67,70,84,89,90]. In combination with the literature, these results show that veterinarians can develop enjoyment of the veterinary work itself (intrinsic satisfaction) when they can care for their patients, clients and community. When this intrinsic satisfaction is achieved, it may act as a protective mechanism against attrition. Furthermore, the inability to care for patients has been associated with staff turnover in medical nurses[80,91]. The inability to care for patients and not being able to ‘give it a 100%*’* was also discussed

in chapter 3 as influential for attrition from clinical practice, indicating this to be an important factor. Understanding when veterinarians are not unable to care for patients and clients is essential. Skovholt *et al.* explains that the intrinsic reward of helping professionals (counselors) can be 'deeply meaningful and satisfying', but work-related difficulties outside the professionals' control can propose challenges to achieve said intrinsic reward[92].

In veterinary practice, there are elements that might restrict the desired delivery of care and the achievement of compassion satisfaction when experiencing meaningful work. Time per patient has relevance. Smith identified stress associated with inadequate time per patient as an important work-related stressor in Queensland veterinarians[46]. Workload (unreasonable number of consultations and surgeries) and the perception of lack of time per patient has been associated with occupational stress in Australian small animal veterinarians, overseas veterinarians, and new graduates[40,73,93]. Although these surveys only provided descriptive analysis of self-reported variables rather than validated measures and statistical modelling, their contributions should be considered. Inadequate time per patient and the perception of 'letting the patient at the back down due to trying to fit in as much as possible' was mentioned in chapter 3 by more than one participant (see chapter 2 supplementary materials for representative quotes). Despite workload not being significantly associated with attrition from clinical practice in chapter 6, it has been mentioned by several studies as a stressor in veterinary practice[40,94,95]. Workload could be acting as an undercurrent source of job dissatisfaction rather than being directly linked to attrition from clinical practice.

Providing resources to ensure or increase patient and client care delivery is suggested to increase job satisfaction and thus retention. Strategies have been suggested such as managing number of patients (patient to nurse ratio) to improve patient care, increase job satisfaction, and reduce patient mortality in medical nurses[80,96]. Furthermore, time available for patient care also correlates with incidence of medical errors[97]. In a study of veterinary technicians, having more than 4 patients per veterinary technician was associated to significantly increased odds of medical (care) errors[97]. Experiencing medical errors and adverse events is distressing for veterinarians[98,99], and exposes them to litigation. Giving veterinarians the time to care for their patients adequately seems to be important for achieving job satisfaction, compassion satisfaction and in turn, staff retention.

The influence of moral distress

Although moral distress was not significantly associated with attrition from clinical practice in this cohort of veterinary clinicians, the development of the MDS-V will help measure this phenomenon in clinical practice. Understanding and measuring moral distress is necessary to counter the effects that it can have on psychological wellbeing and its influence on reduced job satisfaction. In chapter 2, we developed a moral deliberation pathway model derived from the published literature. The model establishes that influential factors such as background,

values and beliefs will modify how a moral conflict is perceived and moral distress (or comfort) develops. These findings mirror the literature in veterinarians and medical nurses, establishing personal factors as influential factors in the development of moral distress[17,20]. Moral and ethical conflicts were identified in chapters 2 and 5. Client financial constraints, colleagues acting unethically, and objectionable euthanasia were recurrent sources of moral conflict. The moral conflicts emerging from this study are similar to those reported in the veterinary literature[20,22,25,99-102].

Following the moral deliberation pathway, interviewees reported experiencing stress from moral and ethical conflicts. Those who reached a resolution expressed moral comfort, whereas those that experienced moral distress expressed it as emotional anguish. A list of veterinary specific moral and ethical conflicts emerged from the combination of moral and ethical conflicts outlined by participants and the conflicts reported in the literature. These, in combination with items associated with MD in healthcare workers, evolved into the MDS-V. Developing this scale was necessary to understand the influence of MD in attrition from veterinary practice. Previously, MD has been described as the discrete outcome of other variables like perfectionism[20], via interviews and field work[100,102], in non-empirical expert commentary[22,26], and by assessing the impact of animal euthanasia[22,26,103]. For the most part, former research in veterinarians' moral distress focuses on describing the situations we defined as moral conflicts[99,101]. Although the impact of MD has been previously assessed via surveys[24], to this date there have been no studies that document the frequency of MD in veterinarians or distress elicited by experiencing moral conflicts. Despite the need for further multiple studies to validate the scale, our moral distress scale was the required tool to explore the relationship between MD and attrition from veterinary practice in a quantitative manner.

Finally, it is possible that MD acts as an undercurrent for job dissatisfaction and veterinary clinicians which, although not necessarily directly linked to attrition, can accumulate with other factors and amplify job dissatisfaction. The underlying theme of moral distress is present in veterinarians and veterinary nurses when discussing their work experiences[90]. One participant of this qualitative study identified a situation of moral conflict that explained why they couldn't do the work anymore[90]. A similar experience was seen in two participants in chapter 3.

In relation to other variables, MD was a significant predictor for burnout in US nurses and medical doctors[104,105], and is associated with burnout in critical care providers[106]. It is evident that understanding moral distress is important. The results of this thesis provide further understanding of moral distress in veterinarians. We also highlighted sources of moral conflict and created a scale to measure moral distress in practice. Measuring moral distress is a useful technique to recognise the elements of practice potentially leading to burnout and job dissatisfaction, which might improve retention if addressed.

Implications for the veterinary profession

Understanding why veterinarians leave practice is the first step when creating evidence-based retention strategies. The reasons why veterinarians leave clinical practice are complex and often interlinked, hence, it is necessary to understand personal and work-related factors in the light of each other rather than as independent variables. Extrinsic factors (such as salary and hours) and intrinsic factors (patient and client care satisfaction) influence whether a veterinarian stays or leaves clinical practice. Understanding and addressing these in combination is crucial when developing retention strategies. Although in this project we do not evaluate the contribution of combination of several variables and the interlink with each other, with the logistic regression model, we investigated a potential relationship of each variable when all others were equal.

The most recurrent extrinsic factors were hours of work and salary. Veterinarians seem to be working longer hours than the average Australian worker and former veterinary clinicians discussed their dissatisfaction with schedules and working hours. The association between working longer hours, presence of on-call duties and dissatisfaction with schedules and attrition from clinical practice was identified. Implementing a reduction of over-time and ensuring adequate rest following after-hours requirements may assist in reducing fatigue and mitigating the effect of on-call duties. Furthermore, reducing hours of work and flexibility with schedules could improve retention. Finally, improving financial remuneration is an essential step, though not without challenges, to increase retention.

The interactions between psychological factors and attrition can be more complex and require further research to be fully understood. The results of this thesis can provide some possible indications to inform such future research. Work stress and overall dissatisfaction could be associated with the demands of veterinary practice (long working hours, moral conflict and other emotional demands). However, results of this study provide possible indications that compassion satisfaction and personal satisfaction with the job could potentially influence retention in clinical practice but due to the limitations on the retrospective use of this measure, further research is required to reach this conclusion. Veterinarians hold value in their ability to care for their animal patients, clients and communities. Increasing the resources that allow them to provide the care they desire may increase retention of veterinarians in practice. Resources to increase job and compassion satisfaction include providing adequate time available per patient[97], becoming part of a local community[35], increasing collegial support[49,107-109], training in empathetic communication[70], recognising moral distress via bioethical training[110], opportunity to use clinical expertise[84], self-care[111], self-compassion[112], recognition from superiors[84], psychoeducation[113], and coping skills training[113].

As discussed, although moral distress was not significantly associated with attrition from clinical practice, this research presents a thorough description of moral distress in veterinarians. Veterinary professionals and

veterinary leaders are encouraged to further expand their understanding of moral distress, with the aim to reduce its frequency and mitigate its effects. Having a psychometric scale to measure moral distress in veterinary clinical settings is an important step to further recognise this phenomenon and address it promptly. Acknowledging the recurrent moral conflicts in veterinarians presented in this study can create the needed awareness to identify them as they occur and develop the required strategies to reach moral comfort instead of distress. Monitoring trends of mental ill-health was proposed by UK researchers as a strategy to improve mental wellbeing in veterinarians[94]. With the use of psychometric scales, this idea could be extrapolated to the attrition phenomenon. Monitoring trends with psychometric measures, such as moral distress or job satisfaction, can give veterinary leadership the tools to find staff at risk of leaving before they exit their current employment, clinical practice or the veterinary profession.

Opportunities for future research

It was interesting to see that other aspects that have influenced job dissatisfaction and work-related stress, such as workload (amount of work to be done in any given time) in medical nurses[85] and companion animal veterinarians[40] did not have a significant relationship with attrition from practice in our study. It is likely that these elements act as an undercurrent of job dissatisfaction or occupational stress but are not directly linked to attrition. It is also possible that a measure designed to assess workload in medical nurses might not accurately encompass the elements of workload in clinical veterinarians, such as number of consultations, time per consultation and number of required surgeries[40]. Developing a job satisfaction measure tailored for clinical veterinarians to assess these elements could clarify the relationship between workload and attrition from practice. Specific items should include, number of consultations, surgeries, time per patient, and time allocated per consultation to evaluate workload.

In this project, a scale to measure moral distress was developed. However, further research is needed to validate the MDS-V. Future studies to validate the MDS-V could include repeating the PCA and CFA with the inclusion of the constructs emerging from the free-text answers; using EFA to determine underlying latent constructs, determination of concurrent and discriminant validity, and perform a correlation analysis in different populations. Furthermore, administering the MDS-V in a different sample population as part of the validation process could yield different results for moral distress in association with attrition. Therefore, it is recommended that the association between veterinary clinical attrition and moral distress be re-assessed in a different population after further validation of the MDS-V.

The researcher chose to use the ProQOL in a retrospective fashion beyond 30 days which is not how the measure was designed to be used. This was done to gain some potential insight of professional quality of life in former veterinary clinicians which has not been previously reported. It is possible that the results are influenced

by affect recall bias and do not represent the true experiences[114] of burnout and compassion satisfaction in former clinicians. Importantly, the results are not intended to be interpreted as indicating fixed personal characteristics or whole-career experiences in relation to attrition from practice. Instead, the results are interpreted as indicating possible opportunities for future research to further understand the potential relationship between professional quality of life and career attrition and/or staff turnover. Such future research would be valuable for the veterinary profession.

This study also highlights some gaps in the literature yet to be fully explored. This study focused on motivations to be a veterinarian, a personal factor that influences attrition from practice. Further research in other personal characteristics (such as personality traits), beliefs and values are required as these characteristics were mentioned by interviews in chapter 3 but were not measured in the quantitative chapters. Understanding their contribution in a wider cohort is still missing. Also, more research is warranted to understand whether working in niche fields of veterinary practice (specialty, shelter etc.) influences retention in practice. Additionally, it would be interesting to observe whether working in general practice (mix animal, equine or small animal) compared to government or other specialty practice poses a higher risk for clinical attrition. Understanding the relationship between niche fields and specialities and attrition is important to be able to further investigate the specific characteristic of these fields that may influence retention. Increasing salaries, reducing hours, and allowing additional time for patient care are recommended strategies for retention. However, the authors acknowledge the financial impact these might have on private veterinary businesses. Proposing strategies to mitigate such financial impact or increase practice profitability is outside the scope of this thesis but needs consideration when implementing retention strategies.

Finally, in this dissertation we used logistic regression modelling to investigate potential contributions of the hypothesised variables and attrition from veterinary clinical practice. Although the models provided results for the contribution of each variable accounting for the influence of other variables as confounders (all else being equal), there was no analysis in relation to the interaction between the variables and the contribution of the combination of variables and the outcome. Considering that both in chapter 3 and the review of the literature the interaction of variables is seen to possibly contribute to attrition, it would be important to assess the contribution of combination of factors and the outcome in future studies.

Limitations of the studies

As with any research project, this study had certain limitations. Participant recollection and recruitment bias could have affected some of the results. Recollection bias could impact the results of the ProQOL[114], which is designed to capture the incidence of the variables within a 30-day period[66]. Chapter 6 used the ProQOL scale to measure CS and CF in former clinicians who (in the majority) had left practice considerably longer than 30 days prior to

the survey meaning that the scores for this cohort may be less accurate. Furthermore, it was not possible to modify the ProQOL measure to account for aspects of CF or CS related to caring for animals (patients), which might show different results than when caring for people (clients).

It was a requirement for ethics approval to present a 'non-applicable' option to answer the moral distress scale, which affected the Likert scores and prevented using the MMD-HP precisely as it was developed. Although a veterinary specific measure was developed for moral distress, it is recommended that this scale is administered in a different population to assess validity. Some of the sub-scales extrapolated from medical nursing might not have adequately captured the constructs of job satisfaction in veterinarians. Other questions more in line with veterinary practice might yield different results for the collegial relations and workload variables. Developing veterinary specific professional measures can improve our understanding of professional wellbeing, job and career satisfaction, and retention in clinical practice. Finally, the logistics regression model uses odds ratio to further characterise the magnitude of significance of the assessed variables. Although odds ratio is the default measurement in SPSS logistics regression modelling, further assessment in changes of risk ratios, probabilities and likelihoods would be required to fully understand the magnitude of the effect that each of the investigated variable has on the outcome variable.

Some subtle yet important differences are evident when the results of the regression, excluding the psychometric scales (chapter 4) and the results of chapter 6 are compared. The population in this final study was approximately 200 respondents, smaller than the population for chapter 4. If the MDS-V scale had been included in the final regression model, the population would have reduced further. This occurred because although most respondents completed the demographic section of the survey, few answered the psychometric scales, and fewer participants responded to the questions associated with moral distress. This population shift was enough for gender to be no longer significant to attrition from practice, and veterinarians that had worked in both rural and metropolitan regions did no longer have higher odds to have left than their solely metropolitan counterparts.

Finally, the category of 'other' in field of work grouped several clinical areas. This grouping was chosen to meet the model requirements but prevented evaluation of the individual sub-categories in this group. Working in 'other' clinical fields could prevent attrition from practice. However, due to the limitations in methodology (having several, widely-varied fields of work under one category), further research is needed to understand whether working in niche fields contributes to retention or whether this contribution depends on a particular clinical field.

Conclusions

When examining working conditions, those that influenced attrition were having on-call duties, more hours of work, lower pay, and worked in metropolitan regions. Further research in regional differences may uncover unique, key elements requiring further address. The contribution of working hours is also reflected in the significant contribution of job dissatisfactions with schedules. Overall, flexibility with hours of work (particularly on-call duties) and increasing remuneration could be a pertinent starting point to retain veterinarians in clinical practice.

Other factors that might influence attrition include being motivated by social purposes, experiencing lower compassion satisfaction, and experiencing lower job satisfaction in relation to personal satisfaction or intrinsic reward. This thesis sets the groundwork for future research to further understand potential relationships of these psychological variables and attrition from veterinary practice. Creating a tool to measure job satisfaction in veterinary clinical practice and a contextualised professional quality of life measure for veterinary clinicians is recommended to guide future research. Finally, the contribution of moral distress was identified by former clinicians as an influential factor for their decision to leave practice but showed no significance when quantitatively assessed in a larger population. Research limitations around the investigation of this variable must be considered. However, regardless of the relationship between moral distress and attrition, understanding and addressing moral distress in veterinary professionals is vital for the mental wellbeing of these professionals.

It is concluded that the reasons for attrition from veterinary clinical practice are complex and varied: there are a range of potential influential elements that often interrelate. Designing retention strategies requires an appreciation of these combined factors. The retention of veterinarians in practice needs to address the adverse and extrinsic working conditions such as on-call, working hours and salary, and enhance the work elements that enable veterinary clinicians to experience job satisfaction, like being able to care for their patients, clients, and communities.

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