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Wellbeing and the One Health workforce: a scoping review

Nicola K. Paul [a], Amy D. Lykins [b], Jay Meynadier [b], and Sujana Adapa [a]

[a]UNE Business School, Faculty of Science, Agriculture, Business and Law, University of New England, Armidale, Australia; [b]School of Psychology, Faculty of Medicine and Health, University of New England, Armidale, Australia

ABSTRACT

The World Health Organization promotes integration of human and veterinary healthcare in a "One Health" approach. Achieving this goal depends on sustainable health workforces, yet both sectors face shortages that are partially driven by poor worker wellbeing. Opportunities for interprofessional learning on vocational wellbeing between the two sectors have been overlooked, and studying human and veterinary health professionals together could provide evidence to support such initiatives. The extent to which wellbeing has been examined in concurrent samples of human and veterinary healthcare workers was unclear, so we conducted a scoping review using JBI methodology. Our analysis of 47 investigations highlighted common professional challenges in the human and veterinary health sectors, although narrow conceptualisations of vocational wellbeing, over-reliance on observational studies, limited diversity of professions investigated, and insufficient theory development presented knowledge gaps. Future researchers should address these limitations to strengthen the evidence underpinning mutual learning on vocational wellbeing among human and veterinary healthcare workers. Doing so may enhance wellbeing for both groups and contribute to a more resilient One Health workforce.

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Health workforce; interprofessional learning; One Health; scoping review; veterinary workforce; vocational wellbeing

Introduction

Worldwide, professional associations have reported significant attrition from veterinary practice and an insufficient supply of new graduates to replace workers who leave (e.g., National Association of Veterinary Technicians in America, 2023; Teller, 2023). These associations have attributed the unsustainability of veterinary careers to a combination of financial stress, negative workplace culture, difficult work-life integration, and lack of career progression. Workforce shortages similarly affect human health systems. World Health Organization (WHO) data collected prior to the COVID-19 pandemic predicted a global shortfall of 10.2 million healthcare workers by 2030 (Boniol et al., 2022). This prediction has not been updated since, but researchers have discovered increased rates of human healthcare workers leaving their roles (De Vries et al., 2023). The reasons for high turnover in human healthcare mirror those listed above for the veterinary sector (De Vries et al., 2023). These parallel professional challenges suggest that there is potential for the two sectors to learn skills and solutions from each other.

One Health workforce: integrating human and veterinary healthcare

The World Health Organization (WHO, 1995, p. 1) defined *health* as "a state of complete physical, mental and social wellbeing" and the National Academy of Medicine (NAM) defined *healthcare workers* as "anyone training to and/or qualified to deliver healthcare" (Brigham et al., 2018, p. 2). The NAM's broad conceptualisation of healthcare workers reflects overlapping risk factors and comparable outcomes among diverse health professionals and their trainees (Brigham et al., 2018). Considered together, these definitions of health and healthcare workers suggest that healthcare is provided by professionals who engage in preventative and reactive care related to biological, psychological, and social wellbeing. Accordingly, examples of human healthcare workers include dentists, paramedics, psychologists, social workers, physicians, and nurses who deliver medical care to humans (hereafter, "physicians" and "nurses"), while examples of veterinary healthcare workers include veterinarians, veterinary nurses and technicians, behaviorists, welfare professionals, nutritionists, and animal attendants.

The workers listed share many vocational experiences from the beginning of their training and onwards throughout their careers. Examples include similar duration and cost of human and veterinary medicine degrees (e.g., Australian Veterinary Association, n.d.; Commonwealth of Australia, 2023), administering comparable treatments for similar diseases in humans and animals (e.g., Osto et al., 2013), responding to social challenges like intimate partner violence (Cleary et al., 2021), and mobilizing during environmental disasters and terrorist attacks (Gilmore et al., 2007). These similar and sometimes overlapping duties of human and veterinary healthcare workers mean the two sectors can be considered under one professional umbrella.

CONTACT Sujana Adapa sadapa2@une.edu.au UNE Business School, Faculty of Science, Agriculture, Business and Law, University of New England, Elm Avenue, Armidale, NSW 2351, Australia

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The WHO (n.d.) has recognised the importance of integrating human and veterinary healthcare through policies, programs, and research that recognise the interconnectedness of humans, animals, and the environment. Strong interprofessional partnerships among health workers are central to this "One Health" approach (European Observatory on Health Systems and Policies, Codd et al., 2023), which the WHO (2023, para. 7) described as "a vital solution for addressing the complex health challenges facing our society." However, high attrition rates among these workers may jeopardise the development of a One Health workforce that can respond to emerging challenges. Professionals in human and veterinary healthcare have cited poor wellbeing as a major factor driving this attrition (Arbe Montoya et al., 2021; Ocean & Meyer, 2023), so understanding wellbeing, its influencing factors, and its consequences for health professionals may guide strategies that sustain health workforces globally.

Wellbeing and the One Health workforce

Seligman (2011) theorised five factors comprising general wellbeing: positive emotions, engagement, relationships, meaning, and accomplishment (PERMA). Donaldson and Donaldson (2021) expanded this model for vocational wellbeing, adding physical health, mindset, work environment, and economic security (PERMA+4). PERMA and PERMA+4 have shown validity in multiple settings (Cabrera & Donaldson, 2024), although these models remain underexplored in healthcare contexts, particularly in veterinary healthcare. Responding to the need for a framework of vocational wellbeing applicable to healthcare, the NAM developed a model of external (e.g., organisational characteristics) and individual (e.g., personal attributes) influences on clinician wellbeing (Brigham et al., 2018). Like PERMA and PERMA+4, the NAM model has demonstrated validity in correlational studies (e.g., Hale et al., 2025), but its applicability across various healthcare settings needs further exploration.

The wellbeing-related variables proposed by these three models can be enhanced or undermined by professional experiences that are common in human and veterinary healthcare. Positive experiences in healthcare work include finding meaning, mastering skills, and engaging in supportive relationships (Brigham et al., 2018), while negative experiences include dealing with non-compliant clients, conflict between the quality and affordability of care, and exposure to potentially traumatizing events (Moir & Van den Brink, 2020; Wong, 2020). Positive experiences may enhance healthcare workers' wellbeing by prompting positive emotions (Paul, Cosh, et al., 2023), while negative experiences can undermine wellbeing by contributing to prolonged distress, physical ill-health, and symptoms of mental disorders (Moir & Van den Brink, 2020; Wong, 2020).

Despite these shared experiences, interprofessional initiatives involving human and veterinary healthcare workers have been limited by an almost exclusive focus on delivering physical medicine, often overlooking professional issues (Courtenay et al., 2014). Expanding such initiatives to include knowledge exchange on supporting vocational wellbeing would ensure that effective approaches in one field can be adapted and applied across the One Health workforce. This approach would be consistent with the most recent core competencies for One Health professionals (Laing et al., 2023), which emphasise communication and collaboration across sectors to address common challenges. The core competencies also emphasise skills consistent with the PERMA+4 and NAM models of wellbeing, such as recovering from unexpected obstacles and responding to unpredictable events. More recently, there have been suggestions to include psychological resilience and managing stress in future iterations of these competencies (McMullen et al., 2025).

Investigating wellbeing among human and veterinary healthcare workers

Studying human and veterinary healthcare workers in tandem provides an opportunity to build evidence for interprofessional learning on vocational wellbeing. Comparative analyses could reveal contextual factors that enhance or undermine wellbeing in healthcare, while ensuring that findings are shared and expanded upon rather than replicated in isolation. The extent to which these opportunities have been explored was unclear. Therefore, to assess the state of knowledge, identify gaps, and guide future research, we conducted a scoping review of published studies on wellbeing in concurrent samples of human and veterinary healthcare workers. We aimed to answer the following questions:

(1) What evidence exists on wellbeing and associated variables in concurrent samples of human and veterinary healthcare workers?
(2) What types of human and veterinary healthcare workers have been compared, and in what settings?
(3) Which wellbeing-associated variables have been examined in samples of human and veterinary healthcare workers, and which measurement tools have been used?
(4) What similarities and differences have been reported between human and veterinary healthcare workers?

Methods

Design

We chose a scoping review to meet our objective of identifying, characterizing, and summarizing published investigations (Peters et al., 2020). We conducted this review in accordance with JBI methodology (Peters et al., 2020) following an a priori protocol (Paul, Lykins, et al., 2023), and results are reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines (Tricco et al., 2018).

The population of interest was human and veterinary healthcare workers defined as professionals who engage in preventative and reactive care related to biological, psychological, and social wellbeing, including students and volunteers. We chose this broad conceptualisation to align with scoping review methodology (Peters et al., 2020) and existing definitions of healthcare workers (e.g., Brigham et al., 2018; World

Health Organization, 2019). Additionally, there was insufficient evidence to justify a priori exclusion of specific professions. We included students because they deliver healthcare during clinical placements and volunteers because they are an important component of healthcare workforces, particularly during crises (e.g., Paul, Cosh, et al., 2023). As such, students and volunteers are routinely exposed to similar work contexts as qualified and paid healthcare professionals, with overlapping implications for wellbeing.

The concept of interest was wellbeing, defined as "a combination of feeling good as well as actually having meaning, good relationships, and accomplishment" (Seligman, 2011, p. 34). Variables related to wellbeing were drawn from prior literature (e.g., Moir & Van den Brink, 2020; Paul, Cosh, et al., 2023; Wong, 2020) and the PERMA+4 and NAM models. We considered sources that reported evidence on our population and concept of interest in any context involving a training or practice setting providing healthcare to humans or animals, in any country.

Search strategy

In June 2023, we conducted a limited search of MEDLINE and PsycInfo, then used index terms and words contained in the titles and abstracts of relevant articles to develop a full search for MEDLINE (Online Supplement I). We adapted this search for PsycInfo, PsycArticles (ProQuest), Scopus, CINAHL (EBSCO), ProQuest Dissertations and Theses, Google Advanced Search, Trip Medical Database, and the WHO Institutional Repository for Information Sharing. We did not restrict the results by date, and the full search was conducted in November 2023. The final step involved manually searching the reference lists of included investigations for additional sources.

Selection criteria

Published peer-reviewed sources and gray literature, excluding conference abstracts and news articles, were considered. Sources that reported evidence on wellbeing and related variables from human and veterinary healthcare workers were included. Sources were excluded if they did not report results from both types of healthcare workers or did not address wellbeing or related variables. During full-text screening, we decided to exclude sources that did not report separate data for human and veterinary healthcare workers, as these did not enable us to address our review questions. Sources were restricted to those published in English due to the language limitations of the research team.

Source of evidence screening and selection

We imported sources into Covidence systematic review software (Veritas Health Innovation, 2023), which removed duplicates automatically. Authors NP and JM piloted the screening process on 25 articles to identify and resolve discrepancies in inclusion decisions. After achieving agreement, the two reviewers screened all imported titles and abstracts against the inclusion criteria, followed by full-text assessment of the remaining sources. The two reviewers worked independently and met to discuss and resolve disagreements at the end of each stage. Reasons for exclusion at full-text review are reported in Online Supplement II.

Data extraction and synthesis

NP extracted data relevant to the research questions using Covidence and a data extraction tool developed for this review (Online Supplement III). Elicit AI research assistant (Elicit, 2023) acted as the second extractor using the same tool and prompts developed by NP (Online Supplement IV). Covidence highlighted discrepancies, and NP resolved disagreements by cross-referencing the reasoning generated by Elicit with the included sources. Disagreements primarily arose from differences in phrasing the same information.

Analysis and presentation of results

The data were exported into Microsoft Excel for quantitative summaries. RStudio (R Core Team, 2024) was used for data visualisation and NVivo (Lumivero, 2023) for qualitative analysis. We collated and visualised proportions of key characteristics of included investigations and coded study designs using descriptions from the included sources and categories from Ranganathan (2019). Characteristics of human and veterinary healthcare workers and settings, along with wellbeing-related variables and measures, were similarly charted. Finally, we conducted an inductive content analysis of extracted findings to characterise comparisons between human and veterinary healthcare workers. NP generated initial codes and categories, then AL and SA reviewed the coding framework for internal consistency and conceptual clarity.

Results

Search and screening

Figure 1 outlines the search and screening process. During full-text screening, the two reviewers encountered 11 disagreements, primarily concerning whether a variable was wellbeing-related or whether a source provided evidence comparing human and veterinary healthcare workers. Through discussion and drawing on prior research, the reviewers agreed that perceptions of career success (Haas et al., 2023), empathy (Nunes et al., 2011), moral judgment (Verrinder et al., 2016), religion (Chen et al., 2020), disaster preparedness (Gilmore et al., 2007), and emotions (Pittenger, 2013) were wellbeing-related, so these six sources were included.

Overview of included sources of evidence

Forty-four journal articles, four Ph.D. theses, and one book met our inclusion criteria. These sources were published sporadically from 1969 – 2004, more regularly from 2005 – 2017, then multiple sources were published each year from 2018 – 2023 (Figure 2). Two sources by (Pittenger, 2011, 2013) reported evidence from the same investigation, as did two by Lewis and Cardwell (2019, 2020), leaving 47 unique investigations.

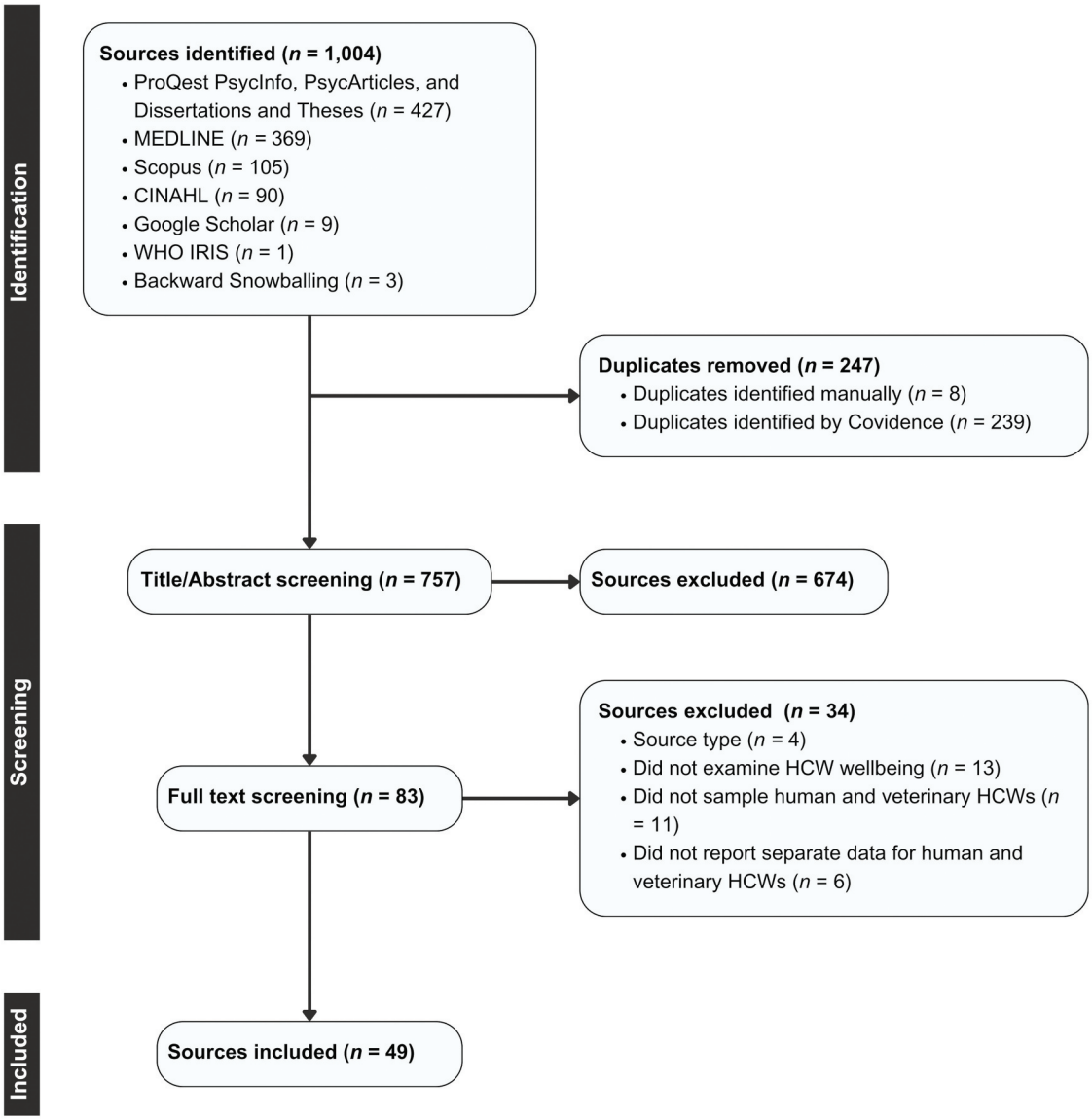


Figure 1. Summary of the search and screening process. *Note.* WHO IRIS = World Health Organization Institutional Repository for Information Sharing. HCWs = Healthcare workers. Sources excluded by title/abstract screening did not report results from both types of healthcare workers or did not address wellbeing or related variables.

Review findings

Characteristics of included investigations

Table 1 lists the characteristics of included investigations. Most investigations employed a cross-sectional design ($n = 31$; 66%) and used surveys to collect data ($n = 29$; 62%). Thirteen (28%) investigations were based on an established theory. Twelve (26%) studies declared sources of funding, eight (17%) stated they did not receive funding, and 27 (57%) did not mention funding.

Characteristics of human and veterinary healthcare workers

cv Table 2 details the characteristics of health professionals and workplace contexts examined in the literature. In summary, 19 (40%) investigations were conducted in the USA, 8 (17%) in the UK, 4 in Australia (8.5%), 3 (6.4%) in Trinidad and Tobago, 3 (6.4%) across multiple countries, and 1 (2.1%) in each of Turkey, Brazil, New Zealand, Denmark, the Netherlands, Austria, Italy, Greece, and Iran. A total of 27 (57%) sources examined evidence from practising healthcare workers only, 18 (38%) focused on students, and 4 (8.5%) included practitioners and students. The workplace contexts represented included agricultural practice, public and private health services, the US military, academia, and students in various years of their human and veterinary health programs. There were 27 human healthcare professions and 8 veterinary healthcare professions investigated (Figure 3). All sources except for Alessio et al. (2006) gathered evidence from veterinarians, and nine sources reported evidence from other animal health professionals as well.

Our characterisation of the gender composition of included samples is framed in binary terms, consistent with all but one source (i.e., Holowaychuk & Lamb, 2023). Sixteen (34%) sources did not report data on gender. From the remaining sources, 13 of 18 (72%) veterinary samples were majority women, while 20 of 35 (57%) human healthcare worker samples were majority men.

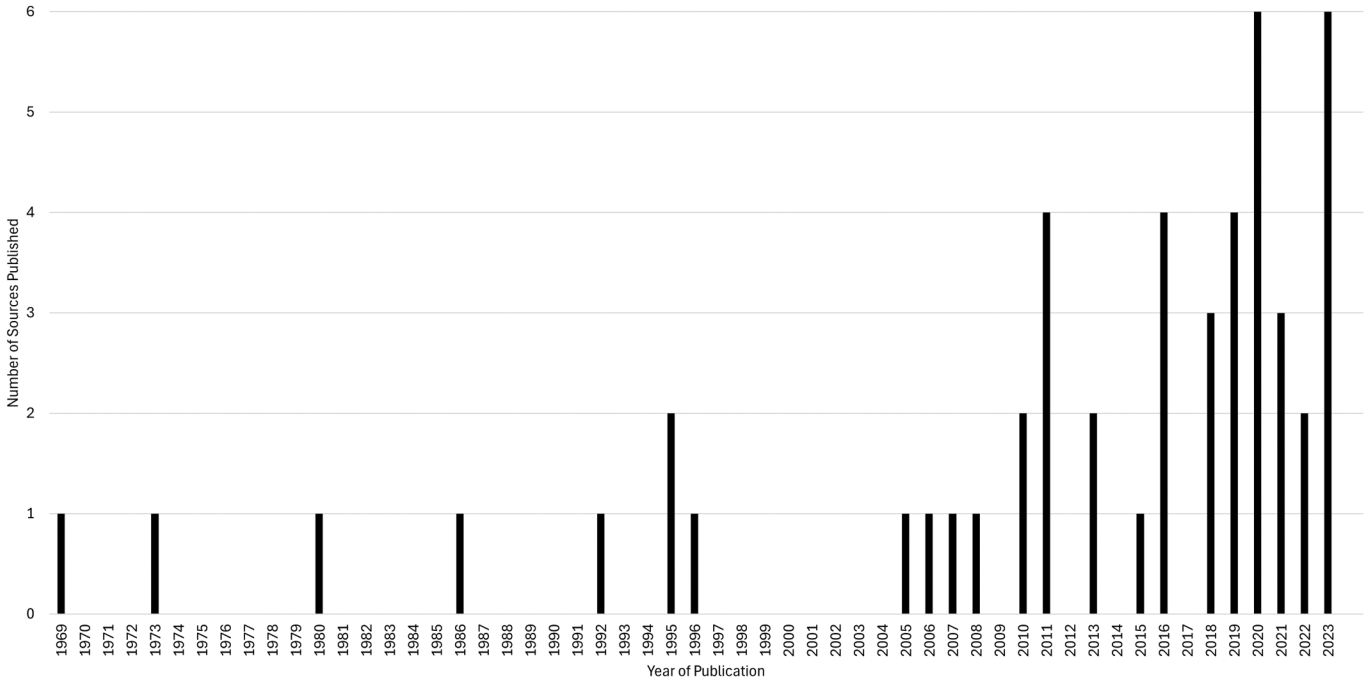


Figure 2. Dates of publication for included sources ($N = 49$).

Table 1. Characteristics of sources of evidence on wellbeing in concurrent samples of human and veterinary healthcare workers.

Citation	Source type	Funding source	Theory/model	Study design	Methodology
Henderson (1969)	Journal article	Not reported	Not reported	Cross-sectional; observational	Biospecimen; interview
McDevitt (1973)	Journal article	Not reported	Not reported	Cross-sectional, observational	Postal questionnaire
Flint (1980)	Ph.D. thesis	Not reported	Theory of Work Adjustment	Cross-sectional	Survey
Fishbain (1986)	Journal article	Not reported	Not reported	Case report	Case study; secondary data analysis
Lange et al. (1992)	Journal article	Not reported	Not reported	Retrospective; observational	Secondary data analysis
Van Doorn (1995)	Journal article	Not reported	Not reported	Retrospective; quasi-experimental	Secondary data analysis; intervention trial
Charlton (1995)	Journal article	Not reported	Not reported	Retrospective case-control	Secondary data analysis
Schulte et al. (1996)	Journal article	Not reported	Not reported	Retrospective; observational	Secondary data analysis
Park et al. (2005)	Journal article	Not reported	Not reported	Retrospective, population-based, case-control	Secondary data analysis
Alessio et al. (2006)	Journal article	Not reported	Not reported	Retrospective (descriptive case series)	Secondary data analysis
Gilmore et al. (2007)	Journal article	None	Not reported	Cross-sectional; mixed-methods; observational; descriptive study	Questionnaire; observations; interviews
Meltzer et al. (2008)	Journal article	Not reported	Not reported	Retrospective; observational	Secondary data analysis
Bartram and Baldwin (2010)	Journal article	Not reported	Stress-diathesis model; "Cry of Pain" model; Four-component model of differential occupational risk	Structured review	Systematic literature search
Skegg et al. (2010)	Journal article	James Hume Fund of the University of Otago; Director's Cancer Research Trust	Not reported	Exploratory retrospective cohort study	Secondary data analysis
Pittenger (2011, 2013)	Ph.D. thesis, journal article	Not reported	Ecological psychology perspective on learning; Participatory culture; Collaborative learning theories	Mixed-methods, quasi-experimental	Focus groups; qualitative analysis of social network posts; quantitative self-report questionnaire
Nunes et al. (2011)	Journal article	Not reported	Not reported	Cross-sectional	Self-report questionnaire

(*Continued*)

Table 1. (Continued).

Citation	Source type	Funding source	Theory/model	Study design	Methodology
Hawton et al. (2011)	Journal article	University of Aarhus; Oxford Health NHS Foundation Trust; Hill's Pet Nutrition; Royal College of Veterinary Surgeons Trust Fund; Veterinary Benevolent Fund	Not reported	Retrospective nested case-control	Secondary analysis of linked data
Villablanca et al. (2011)	Journal article	National Institutes of Health	Not reported	Cross-sectional	Electronic self-report questionnaire; secondary data analysis
Roberts et al. (2013)	Journal article	Not reported	Not reported	Retrospective; observational	Secondary data analysis
Winer et al. (2015)	Journal article	Not reported	One Health	Cross-sectional; descriptive	Online self-report questionnaire
Ward and McMurray (2015)	Book	Not reported	The "Dark side" of organisations; Commodification, functionalist, discordant/congruent, and gendered frameworks of emotional labor; Classical management theory; "Dirty work" and emotional dirty work; Bourdieu's forms of capital; Toxic emotions	Literature review	Narrative review
Pilgrim et al. (2017)	Journal article	Not reported	Not reported	Retrospective case series	Secondary data analysis
Verrinder et al. (2016)	Journal article	Australian Government Department of Education and Training	Kohlberg's three levels of moral reasoning; Rest's moral theories for organizing cooperation in society.	Cross-sectional; observational	Electronic self-report questionnaire
Labbafinejad et al. (2016)	Journal article	Not reported	Not reported	Cross-sectional	Paper-based self-report questionnaire
Lewis and Cardwell (2019)	Journal article	Bloomsbury Consortium	Interpersonal Theory of Suicide (IPTS)	Cross-sectional	Online self-report questionnaire
Lewis and Cardwell (2020)	Journal article	Bloomsbury Consortium	Five-factor model of personality	Cross-sectional; observational	Online self-report questionnaire
Bauer et al. (2019)	Journal article	Penn State Harrisburg	Interpersonal Psychological Theory of Suicide (IPT); Opponent-Process Theory (OPT) and classical behavioral principles; Dynamical Systems Theory	Cross-sectional; observational; longitudinal	Online self-report questionnaire
Knipe et al. (2018)	Journal article	None	Not reported	Cross-sectional; descriptive	Online self-report questionnaire; mixed-methods
Penix et al. (2019)	Journal article	Oak Ridge Institute for Science and Education	Not reported	Cross-sectional; observational	Self-report questionnaire (paper-based)
Ozlek et al. (2019)	Journal article	Not reported	Not reported	Cross-sectional; observational	Questionnaire
Sa et al. (2019)	Journal article	Not reported	Not reported	Cross-sectional; observational	Questionnaire
Yang et al. (2019)	Journal article	None	Not reported	Cross-sectional	Electronic self-report survey
Alshaiji (2020)	Ph.D. Thesis	Not reported	Conceptual Change Model (CCM)	Cross-sectional; observational	Electronic self-report survey
Chen et al. (2020)	Journal article	Templeton Foundation; National Institutes of Health	Deaths from despair (Case and Deaton)	Prospective, population-based, observational, cohort study	Self-report questionnaire; secondary data analysis
Chattu et al. (2020)	Journal article	None	Not reported	Cross-sectional; observational	In-person questionnaire
Hoying et al. (2020)	Journal article	Not reported	None discussed	Cross-sectional; descriptive; observational	Electronic survey
Samara et al. (2020)	Journal article	None	None discussed	Cross-sectional	Questionnaire
Hancock (2021)	Ph.D. thesis	Not reported	Integrative model of uncertainty tolerance; Middle-range theory development; Medical Research Council complex interventions framework; Classical Test Theory; Models of personal epistemologyNone discussed	Cross-sectional; mixed-methods; observational	Self-report survey; systematic review

(*Continued*)

Table 1. (Continued).

Citation	Source type	Funding source	Theory/model	Study design	Methodology
Yu et al. (2021)	Journal article	University of California, Davis and the National Institutes of Health	None discussed	Longitudinal; observational; cross-sectional	Online questionnaire
Rivera et al. (2021)	Journal article	Military Operational Medicine Research Program, Defense Health Program, and Veterans Affairs	None discussed	Longitudinal cohort	Self-report questionnaire
Oliveira Lima et al. (2022)	Journal article	Not reported	None discussed	Cross-sectional; observational	Online questionnaire
Holowaychuk and Lamb (2023)	Journal article	Veterinary Emergency and Critical Care Society; Hill's Pet Nutrition Canada	None discussed	Cross-sectional	Online questionnaire
Zimmermann et al. (2023)	Journal article	Vienna Anniversary Foundation for Higher Education	None discussed	Retrospective; observational	Secondary data analysis
Feakes et al. (2023)	Journal article	Australian Government Research Training Program, Entrepreneurship Commercialisation and Innovation Center, the University of Adelaide, and the Provet Group of Companies	Rational Economic Reasoning theory (Rational self-interest component); Theory of Other-Orientation	Metric conjoint (within-subject) experiment; cross-sectional	Paper-based and online questionnaires
Steffey et al. (2023)	Journal article	Not reported	None discussed	Narrative review	Literature review using Medline and Google Scholar
Adin et al. (2023)	Journal article	Not reported	None discussed	Cross-sectional; descriptive	Electronic questionnaire
Robiner et al. (2023)	Journal article	National Institutes of Health's National Center for Advancing Translational Sciences	None discussed	Retrospective cohort	Secondary data analysis
Haas et al. (2023)	Journal article	None	Interprofessional education (IPE), One Health framework	Cross-sectional; observational; descriptive; mixed-methods	Electronic questionnaire

Most of the 27 student samples were majority women (89%, n = 24), while 26 of 42 (62%) practitioner samples were majority men. All seven physician samples were majority men, as were four of five (80%) dentist samples, two of three (67%) pharmacist samples, and four of nine (44%) veterinarian samples. All four practising nurse samples were predominantly women.

Wellbeing-related variables examined in the literature

Table 3 details the variables and measures reported in the literature, and Figure 4 illustrates the variety of wellbeing-related variables examined over time. Indicators of poor mental health and psychiatric diagnoses were the most studied variables overall, although studies published prior to 2005 more often focused on professional contexts and physical health than mental health. No specific measurement instruments were used widely in the literature.

Similarities and differences between human and veterinary healthcare workers

Table 4 presents the similarities and differences between human and veterinary healthcare workers that were reported by included sources, and Table 5 summarises the results of our content analysis of this information. There were three categories of comparisons relating to health, personal traits and attributes, and professional contexts.

Health. Health-related comparisons of human and veterinary healthcare workers focused on mental health, physical health, and health behaviors, described below.

Mental health. Some sources reported that veterinary professionals had poorer mental health than human health professionals, while others reported similar mental health in the two groups. For example, US military veterinarians were found to have higher incidence of anxiety, traumatic stress, and depression than military medics, physicians, physician assistants, and dentists (Penix et al., 2019; Rivera et al., 2021), but students of veterinary and human medicine had similar incidence of the same (Hoying et al., 2020; Knipe et al., 2018). Likewise, veterinary students in Australia and Brazil, academic veterinarians in the USA, and veterinary emergency hospital workers in the USA, Canada, UK, and Australia reported higher levels of burnout than students of human health, academic physicians, and workers in emergency departments for humans, respectively (Adin et al., 2023; Holowaychuk & Lamb, 2023; Oliveira Lima et al., 2022; Yang et al., 2019), but Alshaiji (2020) found similar levels of burnout among veterinarians, veterinary technicians, animal attendants, physicians, nurses, and medical assistants across multiple countries.

This complexity was further exemplified by evidence on suicide. Some sources reported that veterinary workers

Table 2. Characteristics and contexts of human and veterinary healthcare worker participants.

Citation	Country	Gender Composition of Samples	Healthcare Context	Veterinary Professions	Human Health Professions
Henderson (1969)	UK (England)	Not reported	Dairy farming	Veterinarians	Doctors
McDevitt (1973)	UK (Northern Ireland)	Not reported	Private and government veterinary practice; rural general practice (human)	Veterinarians	Medical practitioners
Flint (1980)	USA	– Veterinarians: 48% women, 52% men – Nurses: 52% women, 48% men – Caseworkers: 74% women, 26% men – Clinical psychologists: 31% women, 69% men – Counseling psychologists: 41% women, 59% men – Dentists: 52% women, 48% men	Practising health professionals	Veterinarians	Dentists; nurses; caseworkers; clinical psychologists; counseling psychologists; speech pathologists; radiologic technicians
Fishbain (1986)	USA	All males	Psychiatric patients	Veterinarians	Physicians
Lange et al. (1992)	USA	Not reported	US Public Health Service Commissioned Corps	Veterinarians	Physicians; dentists; nurses; pharmacists; dietitians; therapists; health services
Van Doorn (1995)	Netherlands	14% female; 86% male	Self-employed health practice	Veterinarians	Dentists; physicians; physical therapists
Charlton (1995)	UK (England and Wales)	77% men; 23% women	Electoral ward of residence	Veterinarians	Pharmacists; dentists; medical practitioners; therapists; nurses
Schulte et al. (1996)	USA	Not reported	Not reported	Veterinarians; animal care workers	Dentists; dental assistants; counselors; social workers; health technicians; nurses; podiatrists; and others
Park et al. (2005)	USA	56% female	Not reported	Veterinarians	Dental assistants; dentists; physicians; social workers
Alessio et al. (2006)	Italy	Not reported	Academic institute of occupational medicine in industrialised Northern Italy	Workers at a veterinary institute for research and treatment of domestic animals	Health department workers for the assistance of elderly subjects and nursery schools
Gilmore et al. (2007)	USA	Not reported	First responders and military in Western Wisconsin	Veterinarians	Physicians; nurses; public health professionals; mental health professionals; health educators; pharmacists; dental professionals
Meltzer et al. (2008)	UK (England and Wales)	Not reported	Not reported	Veterinarians	Dental practitioners; medical practitioners; nurses
Bartram and Baldwin (2010)	Multinational	Not reported	Veterinary training and practice	Practising and student veterinarians; veterinary nurses; veterinary receptionists	Practising and student pharmacists; dentists; nurses; physicians
Skegg et al. (2010)	New Zealand	– Doctors: 93% male, 7% female – Dentists: 100% male, 0% female – Nurses: 27% male, 73% female – Pharmacists: 62% male, 38% female – Veterinarians: 33% male, 67% female	Not reported	Veterinarians	Dentists; doctors; nurses; pharmacists
Pittenger (2011, 2013)	USA	72% women; 28% men	Second- through fourth-year university health profession studies	Students of veterinary medicine	Students of medicine; nursing; dentistry; pharmacy; public health
Nunes et al. (2011)	Trinidad and Tobago	73% female	University undergraduate health science courses	Students of veterinary medicine	Students of pharmacy; dentistry; nursing; medicine
Hawton et al. (2011)	Denmark	– Nurses: 95% female, 5% male – Physicians: 80% male, 20% female – Dentists: 78% male, 22% female – Pharmacists: 54% male, 46% female – Veterinarians: 88% male, 12% female	Practising health professionals	Veterinary surgeons	Nurses; physicians; dentists; pharmacists
Villablanca et al. (2011)	USA	– Medicine: 61.9% male, 38.1% female – Veterinary medicine: 48.1% male; 51.9% female – Biological science: 69.4% male; 30.6% female	University faculty	Faculty of the school of veterinary medicine (Assistant Professor or Professor level)	Faculty of the school of medicine (Assistant Professor or Professor level)

(*Continued*)

Table 2. (Continued).

Citation	Country	Gender Composition of Samples	Healthcare Context	Veterinary Professions	Human Health Professions
Roberts et al. (2013)	UK (England and Wales)	Not reported	Occupational settings from the late 1970s to the early 2000s	Veterinarians	Pharmacists; dentists; doctors; radiographers; nurses; hospital porters
Winer et al. (2015)	USA	– Medical students: 54% female – Veterinary students: 79% female	University studies	Medical and veterinary students	
Ward and McMurray (2015)	Not reported	Not reported	Frontline service work	Veterinarians; veterinary technicians	Nurses; home care workers; medical receptionists; counselors
Pilgrim et al. (2017)	Australia	37% male; 63% female	Not reported	Veterinarians	Medical practitioners; nurses; dentists; physiotherapists; occupational therapists; pharmacists; psychologists; paramedics
Verrinder et al. (2016)	Australia	– Vet Sci: 83% female – Vet Tech: 95% female – Animal Sci: 88% female – Medicine: 41% female	First year university studies	Veterinary medicine, veterinary technology, and animal science students	Medical students
Labbafinejad et al. (2016)	Iran	– Veterinary students: 60% female; 40% male – Medical students: 61% female; 39% male	University undergraduate studies in Tehran	Veterinary students	Medical students
Lewis and Cardwell (2019, 2020)	UK (England)	– Veterinary students: 84% female – Medical students: 75% female – Pharmacy students: 81.4% female – Dentistry: 77% female	Undergraduate university studies	Veterinary medicine students	Medicine, pharmacy, and dentistry students
Bauer et al. (2019)	USA	– Veterinary students: 79% female – Physicians: 63% male	University veterinary studies and human medical practice	Undergraduate veterinary students	Licensed physicians
Knipe et al. (2018)	UK	76% female	Undergraduate university health science studies	Veterinary science students	Medicine and dentistry students
Penix et al. (2019)	USA/Afghanistan	– Veterinary personnel: 62% male; 38% female – Nonveterinary personnel: 54% male; 46% female	Military deployment in Afghanistan, in a combat environment	Veterinarians and veterinary technicians	Combat medics, physicians, and physician assistants
Ozlek et al. (2019)	Turkey	60.87% male; 39.13% female.	University undergraduate studies	Veterinary medicine students	Dentistry and medicine students
Sa et al. (2019)	Trinidad and Tobago	73% female	First-year undergraduate health students; diverse student population; national history of colonisation and immigration	Veterinary medicine students	Medical, dental, nursing, pharmacy, and optometry students
Yang et al. (2019)	Australia	82.3% female; 17.7% male	Doctor of Veterinary Medicine studies	Veterinary students and practising veterinarians	Medical students and junior medical officers (JMOs)
Alshaiji (2020)	USA	Not reported	Outpatient, inpatient, emergency, and specialty clinics in human healthcare; Teaching hospitals in veterinary healthcare	Veterinarians, veterinary technicians, and animal attendants	Physicians, nurses, and medical assistants
Chen et al. (2020)	USA	61% female (registered nurses); 39% male (other health professions)	Health practice in the USA	Veterinarians	Registered nurses, dentists, pharmacists, optometrists, osteopaths, and podiatrists
Chattu et al. (2020)	Trinidad and Tobago	28.4% male; 71.6% female	University undergraduate study	Veterinary medicine students	Medicine, dentistry, pharmacy, nursing, and optometry students
Hoying et al. (2020)	USA	Not reported	First-year graduate health science studies at a large university in the Midwest region	Veterinary medicine students	Dentistry, medicine, nursing, optometry, pharmacy, and social work students
Samara et al. (2020)	Greece	67% female; 34% male	University undergraduate health studies in a country with high smoking rates in the general population	Veterinary medicine students	Medical students, nursing, biochemical, and medical laboratory students
Hancock (2021)	UK	Not reported	University training in human and veterinary medicine	Undergraduate veterinary students	Doctors-in-training (medical undergraduate students and postgraduate doctors)
Yu et al. (2021)	USA	– Medicine: 66% female; 34% male – Nursing: 76% female; 24% male – Veterinary medicine: 88% female; 12% male	University studies	Veterinary medicine students	Medicine and nursing students

(*Continued*)

Table 2. (Continued).

Citation	Country	Gender Composition of Samples	Healthcare Context	Veterinary Professions	Human Health Professions
Rivera et al. (2021)	USA	– Veterinarians: 59.4% female; 40.6% male – Non-trauma physicians: 37.5% female; 62.5% male – Trauma physicians: 27% female; 73% male – General dentists: 33.6% female; 66.4% male – Veterinary technicians: 66.3% female; 33.7% male – Medics: 46.1% female; 53.9% male	US military	Veterinarians and veterinary technicians	Physicians, dentists, and medics
Oliveira Lima et al. (2022)	Brazil	73% female	Private university center; undergraduate studies	Veterinary medicine students	Dentistry, pharmacy, psychology, aesthetics and cosmetology, physiotherapy, and psychology students
Holowaychuk and Lamb (2023)	USA, Canada, UK, and Australia	85% female; 14.4% male; 0.6% undisclosed gender	Emergency veterinary practice (hospital and general practice)	Veterinarians, veterinary technicians, veterinary specialists, managers/ administrators, residents, interns, assistants, client care representatives, and students	Emergency department human healthcare professionals with similar demographic characteristics (a prior sample)
Zimmermann et al. (2023)	Austria	– Physicians: 27.7% women; 72.3% men – Dentists: 24.1% women; 75.9% men – Veterinarians: 18.5% women; 81.5% men – Pharmacists: 59.6% women; 40.4% men	High-skilled professionals	Veterinarians	Physicians, dentists, and pharmacists
Feakes et al. (2023)	Australia	– Veterinary students: 75.4% women – Nursing students: 90.8%	Final-year university studies	Veterinary students	Nursing students
Steffey et al. (2023)	USA, Europe, Canada	N/A (review)	American labor laws and workplaces	Veterinarians	Physicians
Adin et al. (2023)	USA	54% female; 37% male	A large university veterinary teaching and referral hospital after one year of the COVID-19 pandemic	Academic veterinarians	Academic physicians
Robiner et al. (2023)	USA	78.7% women; 21.3% men	Hospitals, clinics, offices, nursing homes, and other healthcare facilities; homes, and community/ public spaces	Veterinarians.	Nurses, dentists, pharmacists, psychiatrists, social workers, nonpsychiatric physicians, physician assistants, and psychologists
Haas et al. (2023)	USA	Not reported	University graduate health studies	Doctor of Veterinary Medicine/Master of Public Health dual degree students	Master of Public Health students

Note. Terminology used to describe gender and professions is reported as in the original sources, to accurately reflect the literature and avoid interpretation by the researchers.

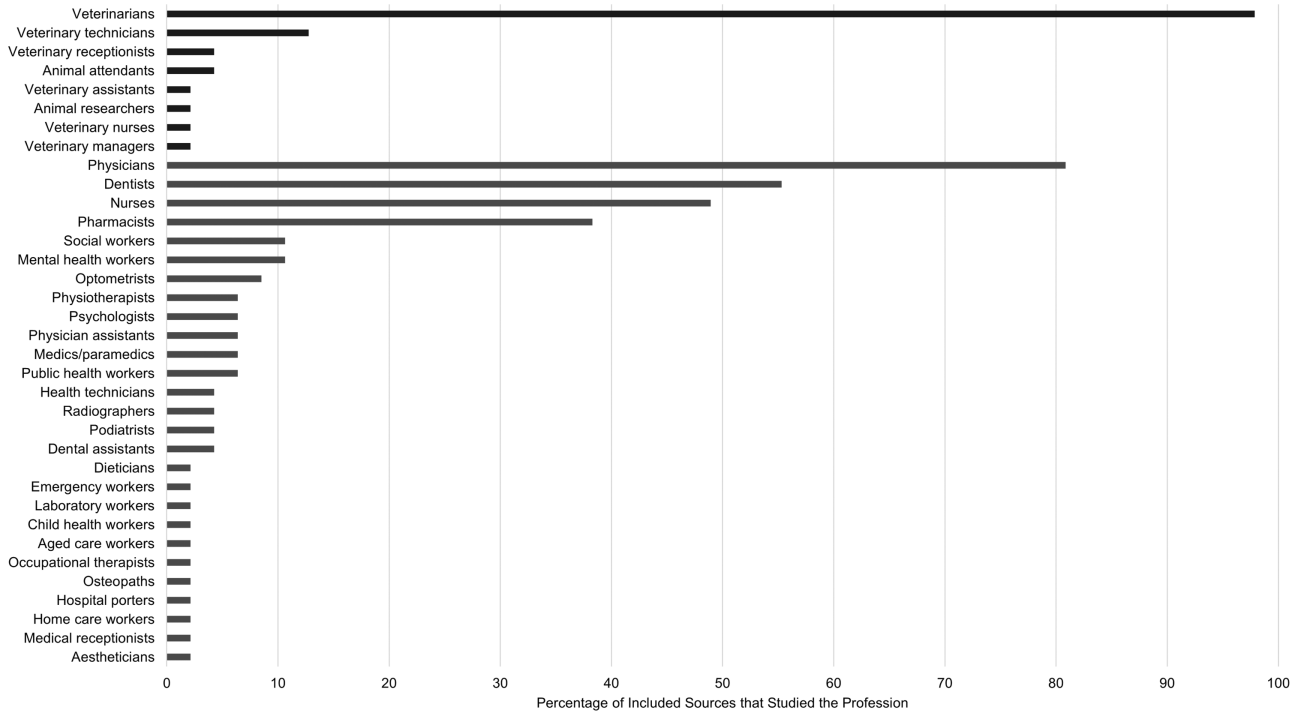


Figure 3. Veterinary and human healthcare professions investigated by included sources ($N = 49$).

faced higher risk from suicide than human healthcare workers, others found the opposite, and still others reported similar suicide risk between the two. Accordingly, retrospective investigations spanning multiple decades in the USA and UK found suicide was a more likely cause of death for veterinarians than it was for various human health professionals (Charlton, 1995; Lange et al., 1992; Roberts et al., 2013). However, other investigations using similar methodology found pharmacists, nurses, and physicians in New Zealand and Denmark were more likely than veterinarians to die from suicide (Hawton et al., 2011; Skegg et al., 2010), while Pilgrim et al. (2017) and Zimmermann et al. (2023) reported similar suicide patterns among human and veterinary healthcare workers in Australia and Austria. Similarities and differences in suicide methods were also highlighted. Self-poisoning using barbiturates was reported as the preferred method among veterinarians, physicians, nurses, and pharmacists (Bartram & Baldwin, 2010; Skegg et al., 2010; Zimmermann et al., 2023). However, Pilgrim et al. (2017) reported a difference in the drugs most often used to self-poison, and Hawton et al. (2011) noted that veterinarians were more likely than human healthcare workers to use firearms to carry out suicide.

There was consistent evidence supporting two conclusions related to suicide. First, healthcare workers, regardless of their patients' species, showed the highest risk from suicide of all occupational groups (Charlton, 1995; Lewis & Cardwell, 2019; Meltzer et al., 2008; Pilgrim et al., 2017; Roberts et al., 2013; Zimmermann et al., 2023). Second, human and veterinary healthcare workers regularly accessed suicide means through their workplaces (Bartram & Baldwin, 2010; Hawton et al., 2011; Pilgrim et al., 2017; Skegg et al., 2010; Zimmermann et al., 2023).

Physical health. Indicators of physical wellbeing in the literature included risk and causes of death (Lange et al., 1992; Robiner et al., 2023), general physical functioning (Chattu et al., 2020), sleep problems (Rivera et al., 2021; Steffey et al., 2023), and musculoskeletal injuries (Alessio et al., 2006; Van Doorn, 1995). Diseases like Q fever and brucellosis were also examined (Henderson, 1969; McDevitt, 1973), as were neurodegenerative diseases. For example, death records in the USA showed physicians and veterinarians shared elevated risk of mortality from neurodegenerative diseases compared with other diseases, but differences were highlighted in the types of neurodegenerative diseases most likely to affect each profession (Park et al., 2005; Schulte et al., 1996).

Health behaviours. Comparisons of smoking rates (Samara et al., 2020), self-care (Penix et al., 2019), access to dental treatments (Ozlek et al., 2019), and compliance with medical interventions (Fishbain, 1986) were reported in the literature, although drug use for purposes other than suicide was the health-influencing action most frequently compared. Case studies indicated that veterinarians and physicians shared their preferred drugs, sourcing drugs from work, and methods used to self-administer, but veterinarians became impaired at a younger age than physicians (Fishbain, 1986). Another difference was captured in lower psychotropic medication use for veterinary technicians than medics in the US military (Rivera et al., 2021).

Table 3. Variables and measures used in sources of evidence on wellbeing in concurrent samples of human and veterinary healthcare workers.

Citation	Variables	Measures
Henderson (1969)	Q-fever and leptospirosis antigens; physical symptoms; health history; absence from work	Complement-fixation test; agglutination test
McDevitt (1973)	Brucellosis symptoms; age group; contact with cattle; ill health; profession	Self-reported symptoms of chronic brucellosis
Flint (1980)	Sex, satisfaction, career length, supervisory role, self-employment, reinforcer perceptions, sex dominated profession	Minnesota Job Description Questionnaire; Minnesota Satisfaction Questionnaire
Fishbain (1986)	Profession; age; contributors to impairment; type of impairment; drug characteristics; psychiatric diagnosis; history of psychiatric disorders; treatment variables	N/A
Lange et al. (1992)	Mortality rate/risk; cause of death; professional category; active-duty status	Mortality records
Van Doorn (1995)	Profession; age; deferred period; insured daily compensation; diagnosis; degree/duration of disability; psychosocial characteristics	ICD-9 codes; physician assessments
Charlton (1995)	Cause of death; age; sex; marital status; birth country; occupation; features of electoral ward of residence	Death certificates; census
Schulte et al. (1996)	Cause of death; occupation; demographic characteristics	Death certificates; census; ICD-9 codes; job-exposure to solvents and magnetic fields matrices
Park et al. (2005)	Occupation; cause of death	Death certificates
Alessio et al. (2006)	Diagnostic codes, referring subjects, diagnosis; fitness-for-work; work environment	Health surveillance; fitness for work evaluations
Gilmore et al. (2007)	Knowledge; training; resources; communication; coordination	Self-reported knowledge; observer records
Meltzer et al. (2008)	Death from suicide; occupation; age; gender	Death certificates; census
Bartram and Baldwin (2010)	Gender; profession; career length; access to suicide means; euthanasia attitudes; cognitive factors; debt; suicide exposure; personality; coping strategies; work-related factors; major incidents; client complaints; stigma; psychiatric illness; risk of suicide	Proportional mortality ratio (PMR)
Skegg et al. (2010)	Gender; occupation; death by suicide; suicide method	Death certificates; census; ICD codes; New Zealand Standard Classification of occupations codes
Pittenger (2011, 2013)	College of enrollment; pedagogical group; engagement; attitude to interprofessional collaboration; social network use; professional identity; program satisfaction	Interdisciplinary education Perception Scale (IEPS); Readiness for interprofessional learning Scale (RIPLS)
Nunes et al. (2011)	Empathy; age; gender; time point; health discipline	Jefferson Scale of Empathy (JSE)
Hawton et al. (2011)	Occupation; gender; age; suicide risk; psychiatric service contact; suicide method; marital status; gross income; labor market status	Danish Cause of Death Register; Integrated Database for Longitudinal Labour Market Research; Danish Psychiatric Central Register
Villablanca et al. (2011)	School; gender; awareness and use of career flexibility options; barriers to using career flexibility options; career satisfaction; participant demographics; career characteristics	Work, Family, and Satisfaction Survey; AAMC's Collaborative on Academic Careers in Higher Education (COACHE) satisfaction survey
Roberts et al. (2013)	Suicide rate; occupation	Census data; standardised mortality ratio (SMR); proportional mortality ratio (PMR); ICD codes
Winer et al. (2015)	Program of study; specialty of interest; interest in One Health; attitudes toward interprofessional education and collaboration; knowledge gained	Bespoke survey items
Ward and McMurray (2015)	Emotional labor	Not reported
Pilgrim et al. (2017)	Cause and intent of death; occupation; age; sex; employment status; medical and mental health history; circumstances of death; drug exposure and use characteristics	Coronial and court reports
Verrinder et al. (2016)	Moral judgment (personal interest, maintaining norms, universal principles); participant demographics; prior degrees; experience with animals	Vet Defining Issues Test (VetDIT)
Labbafinejad et al. (2016)	Quality of life (encompassing physical and role limitations, vitality, general mental health, social activity limitations, bodily pain, and perceived general health); program of study; BMI; participant demographics	Short Form Health Survey (SF-36)
Lewis and Cardwell (2019)	Participant demographics; year of study; previous degrees; wellbeing (mental wellbeing, psychological distress, depression, suicidal ideation and attempts)	Warwick-Edinburgh mental well-being Scale (WEMWBS); General Health Questionnaire (GHQ); Beck Depression Inventory-II (BDI); Adult Psychiatric Morbidity in England survey (two questions on suicide)
Lewis and Cardwell (2020)	As above, with personality factors	As above, with NEO Five-Factor Inventory (NEO-FFI); Frost Multidimensional Perfectionism Scale (FMPS)
Bauer et al. (2019)	Exposure to euthanasia; year in school (for vet students); age; previous suicide attempts; acquired capability for suicide; painful and provocative events; fearlessness about death	Acquired Capability for Suicide (ACSS); Exposure to euthanasia scale (EES); Painful and provocative events scale (PPES); Life Events Scale-Medical Doctors (LES-MD)
Knipe et al. (2018)	Age; gender; course type; depression; anxiety; self-harm; alcohol use disorders; well-being; help-seeking barriers and enablers	Patient Health Questionnaire (PHQ-9); Generalised Anxiety Disorder Assessment (GAD-7); Alcohol Use Disorders Identification Test (AUDIT); Warwick-Edinburgh Mental Well-being Scales (WEMWBS)
Penix et al. (2019)	Demographics (gender, branch, component, rank); deployment-related experiences (combat events, professional demands, number of deployments); behavioral health symptoms (suicidal ideation, depression, anxiety, PTSD, STS); protective factors (self-care, caring for coworkers, perceived leadership)	Walter Reed Army Institute of Research (WRAIR) Combat Experiences Scale; Patient Health Questionnaire-9 (PHQ-9); Generalised Anxiety Disorder-7 (GAD-7); PTSD Checklist (PCL); WRAIR Secondary Traumatic Stress Inventory

(*Continued*)

Table 3. (Continued).

Citation	Variables	Measures
Ozlek et al. (2019)	Socio-demographic characteristics; dental anxiety; dental fear; history of psychiatric disorder; physical exercise frequency; undergraduate major	Modified Dental anxiety Scale (MDAS); Dental Fear Scale (DFS)
Sa et al. (2019)	Program of study; emotional intelligence; empathy; self-esteem; participant demographics (gender and ethnicity)	Jefferson Scale of Physician Empathy; Trait Meta Mood Scale; Rosenberg Self-Esteem Inventory
Yang et al. (2019)	Psychological distress; participant demographics and study characteristics; engagement in paid work; physical exercise	Kessler Psychological Distress Scale (K10)
Alshaiji (2020)	Learning behavior (single- and double-loop); burnout (emotional exhaustion, depersonalisation, personal accomplishment)	Learning behavior codebook; Maslach Burnout Inventory (MBI)
Chen et al. (2020)	Religious service attendance; deaths from despair; participant demographic characteristics; health care use; alcohol; nicotine and caffeine use; body mass index; physical activity; health conditions; social integration; night-shift work; occupation	Self-reported frequency of religious service attendance; death certificates
Chattu et al. (2020)	Quality of life; participant demographics; academic performance	Cumulative grade point average; WHO Quality of Life (WHOQOL-BREF)
Hoying et al. (2020)	Depression; anxiety; stress; healthy lifestyle beliefs and behaviors; physical health; participant demographics	Healthy Lifestyle Beliefs Scale (HLBS); Healthy Lifestyle Behaviors Scale (HLBHS); Brief Inventory of Perceived Stress (BIPS); Patient Health Questionnaire 9 (PHQ-9); General Anxiety Disorder Scale (GAD-7); Single items regarding general health
Samara et al. (2020)	Smoking history; current smoking status; desire to quit; participant demographic and social characteristics; alcohol consumption; school and year of study; access to smoking cessation supports; education and knowledge about tobacco use and cessation	Global Health Professions Student Survey (GHPSS; modified)
Hancock (2021)	Tolerance of ambiguity; psychological wellbeing (stress, burnout, mental health disorders); sex; graduate entry status; year and type of programme; personal; cultural; workplace factors	Tolerance of Ambiguity in Medical Students and Doctors (TAMSAD); Tolerance of Ambiguity in Veterinary Students (TAVS)
Yu et al. (2021)	Participant demographics; academic records; program of study; resilience; COVID-related stressors; frequency of seeking COVID information	Brief Resilience Scale (BRS)
Rivera et al. (2021)	Participant demographics; PTSD; depression; panic; anxiety; suicidal ideation; psychotropic medication use; problem drinking; trouble sleeping; lack of social support; military healthcare occupation; financial problems; pay grade; deployment experience	PTSD Checklist-Civilian Version (PCL-C); Patient Health Questionnaire (PHQ)
Oliveira Lima et al. (2022)	Burnout syndrome; participant demographics; paid employment; physical activity and leisure; daily hours of sleep; perception of restful sleep; physician visits; family members; course of study; course characteristics; course perceptions	Maslach Burnout Inventory-Student Survey (MBI-SS)
Holowaychuk and Lamb (2023)	Gender; position in practice; practice setting; private or corporate referral hospital; years in practice; presence of children and pets in the home; association membership; out-of-hours work; relationship status; burnout symptoms (emotional exhaustion, depersonalisation, personal accomplishment); work characteristics (workload, control, reward, community, fairness, values)	Maslach Burnout Inventory (MBI) Human Services Survey for Medical Personnel; Areas of Worklife Survey (AWS)
Zimmermann et al. (2023)	Cause of death; gender; profession; suicide methods	Death certificates; ICD codes
Feakes et al. (2023)	Other-orientation; self-interest; academic discipline; gender; age; nationality; prosociality; importance of career-derived income; university	Rating the attractiveness of various professional positions; self-reported altruistic attitudes and beliefs (8 items); self-reported importance of income (2 items)
Steffey et al. (2023)	Sleep insufficiency; sleep inertia; fatigue awareness and acknowledgment; work hours; performance; medical errors	N/A (review)
Adin et al. (2023)	Overall burnout; work exhaustion; interpersonal disengagement; professional fulfillment; self-reported medical errors; gender; clinical service area; academic rank; length of time as a faculty member	Stanford Professional Fulfillment Index (PFI) medical error items
Robiner et al. (2023)	Occupation; assailant characteristics; age; gender; homicide rate	National Violent Death Reporting System (NVDRS); law enforcement and coroner narratives
Haas et al. (2023)	Perceived program effectiveness; dual-degree enrollment status; factors informing program choice; semester of program entrance; planned course of study; program emphasis area; previous education; knowledge of public health competencies	Likert survey items written for this study and open questions

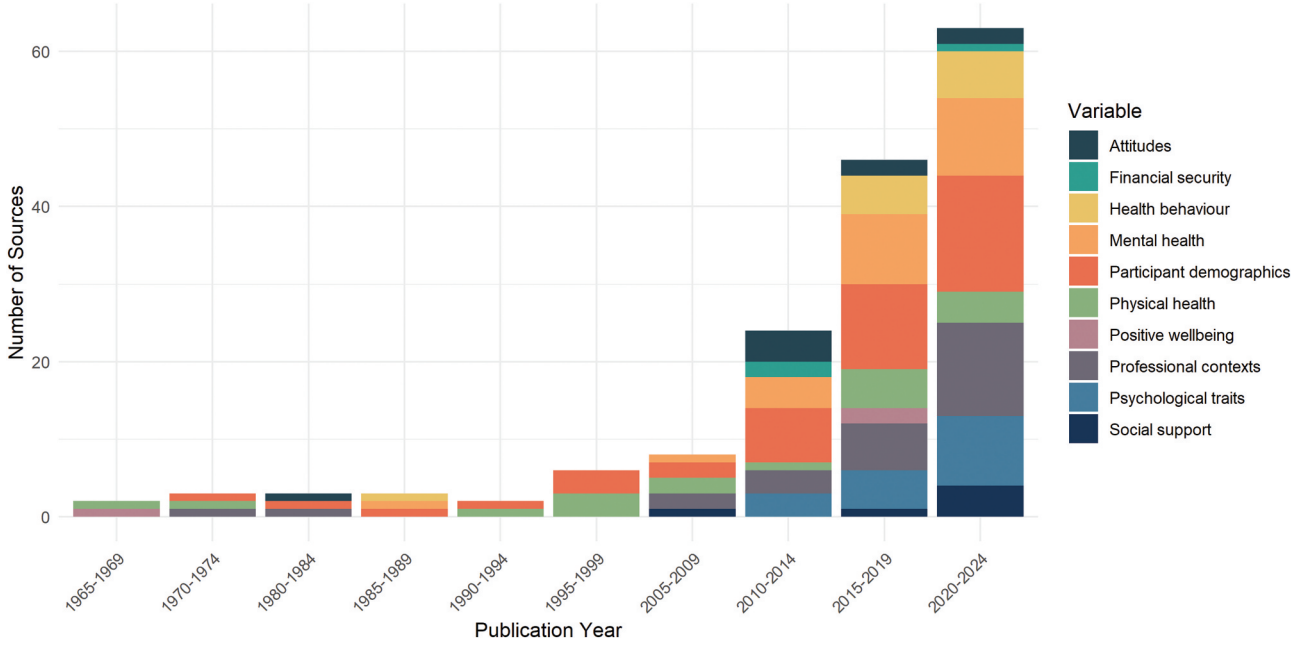


Figure 4. Wellbeing-related variables investigated by included sources ($N = 49$) over time.

Personal traits and attributes. Comparisons of individuals' defining characteristics fell into three subcategories relating to psychological traits, attitudes, and demographic patterns.

Psychological traits. Patterns of thoughts, feelings, and cognitions where similarities between human and veterinary healthcare workers were highlighted related to empathy levels (Nunes et al., 2011; Sa et al., 2019), moral reasoning (Verrinder et al., 2016), personality (Feakes et al., 2023; Hancock, 2021; Lewis & Cardwell, 2020), self-esteem and emotional intelligence (Sa et al., 2019), and learning strategies (Chattu et al., 2020). Differences were also noted for many of the same traits. For example, veterinary, pharmacy, dentistry, nursing, and medicine students in Trinidad and Tobago self-reported a similar rate of decline in empathy levels during their first year of study, although veterinary students had lower empathy overall than students of human health (Nunes et al., 2011). Likewise, veterinary, human medicine, pharmacy, and dentistry students in England self-reported similar levels of neuroticism (Lewis & Cardwell, 2020), while veterinary and nursing students in Australia demonstrated similarly high other-orientation and low self-interest, although nursing students were slightly more other-oriented and prosocial than veterinary students (Feakes et al., 2023).

Attitudes. Comparisons related to attitudes reflected human and veterinary healthcare workers' opinions, beliefs, and evaluations of their occupations. These attitudes were examined using data on professional satisfaction and reinforcers (Alshaiji, 2020; Flint, 1980; Villablanca et al., 2011), and perceptions of workplace policy fairness (Villablanca et al., 2011). Several sources explored the attitudes of health students, including those studying veterinary medicine, pharmacy, dentistry, nursing, human medicine, and public health. Students of these disciplines in multiple countries reported similar beliefs about academic expectations, perceptions of their intended professions, interprofessional collaboration, and One Health (Bartram et al., 2010; Pittenger, 2011, 2013; Winer et al., 2015), although veterinary students in the USA viewed interprofessional collaboration and One Health more favorably than did students of human medicine (Winer et al., 2015).

Demographic patterns. Comparisons of human and veterinary healthcare workers' social and economic attributes included age (Fishbain, 1986; Verrinder et al., 2016) and career length (Villablanca et al., 2011), although data on gender revealed the greatest number of demographic comparisons between the two groups. Analyses of death certificate, census, law enforcement, coronial, and other government data in the UK, USA, and New Zealand showed that women working in human and veterinary healthcare were more likely to die from suicide than women in general, which was not the case for men (Charlton, 1995; Meltzer et al., 2008; Robiner et al., 2023; Skegg et al., 2010). However, evidence was also reported that men and women in veterinary medicine had a similarly high suicide risk, unlike men and women in human healthcare, where more pronounced gender differences existed (Bartram & Baldwin, 2010; Zimmermann et al., 2023).

Professional contexts. Comparisons of the environments in which human and veterinary healthcare is delivered focused on workload (Labbafinejad et al., 2016; Yu et al., 2021), leadership (Haas et al., 2023; Penix et al., 2019), resources (Gilmore et al., 2007; Yu et al., 2021), and medical errors (Adin et al., 2023). Additionally, there were multiple sources that highlighted emotionally taxing responsibilities (e.g., receiving abuse from clients and witnessing suffering) for veterinarians, medical receptionists, home care workers, and medical and veterinary students from multiple countries (Gilmore et al., 2007; Labbafinejad et al., 2016; Ward & McMurray, 2015).

Table 4. Similarities and differences between human and veterinary healthcare workers.

Citation	Similarities	Differences
Henderson (1969)	None specified.	Veterinarians had a higher rate of positive Q fever sera (38%) than doctors and civil servants (18%), suggesting veterinarians had greater exposure and infection rates.
McDevitt (1973)	Alimentary symptoms and insomnia did not differ significantly between veterinary surgeons and general practitioners.	A greater number of veterinary surgeons than general practitioners reported brucellosis symptoms, and weakness, malaise, irritability, depression, arthritis, and backache occurred more frequently in veterinarians than general practitioners. Frequency of brucellosis symptoms in veterinarians was greater than would be expected in the general population, which was not the case for general practitioners.
Flint (1980)	For both human and veterinary healthcare professions, males and females within the same profession had similar occupational satisfaction scores and occupational reinforcer patterns.	There were some differences between veterinarians and participants from human healthcare occupations relating to factors that influenced their perceptions of occupational reinforcers.
Fishbain (1986)	The drug-impaired veterinarians in this study had similar patterns of drug use to those found in published data on drug-impaired physicians. The two types of health professionals also reported similar stressors contributing to their drug use and similar psychiatric history and diagnoses. Veterinarians were also noncompliant patients, as were many physicians.	The veterinarians' median age was younger than that of impaired physicians reported previously; these veterinarians became impaired at a younger age and after fewer years in practice than many physicians. Many physicians reported illness and pain as contributing to their drug use, whereas the veterinarians in this sample did not.
Lange et al. (1992)	None specified.	Veterinarians had significantly higher risk of death from any cause, and pharmacists significantly lower, than other health professionals. Veterinarians also died from unintentional injury and suicide at significantly higher rates than other professionals.
Van Doorn (1995)	– Rates of low back pain disability increased for all health professional groups over 13 years, and similar patterns of association between low back pain disability and profession were observed across all groups. – Self-employed professionals in these fields were more likely to take sick leave for severe back pain than the general workforce. – Veterinarians and human physical therapists had greater risk of low back pain disability than other health professionals.	– Veterinarians had the lowest rate of ending insurance payments because they were able to return to work, suggesting their disability was more likely to be ongoing compared with human health professionals. – Veterinarians' low back disability claims increased seasonally (around December), unlike the other health professionals.
Charlton (1995)	Healthcare professions (including veterinarians, medical practitioners, dentists, pharmacists, and nurses) had a higher relative risk of suicide than other occupations. For women, suicides were more concentrated in the top 10 occupation groups, including human and animal health professions, with about 5% of all suicides being among nurses.	Veterinarians had particularly high rates of suicide risk compared to other occupations.
Schulte et al. (1996)	None specified.	Various human healthcare workers were represented in the highest ranked occupations for risk of Alzheimer's disease, presenile dementia, Parkinson's disease, and motor neurone disease. Veterinarians were only among the highest ranked occupations for motor neurone disease.
Park et al. (2005)	Healthcare occupations (e.g., veterinarians, dental workers) showed similar patterns of elevated risk of mortality from neurodegenerative diseases compared with mortality from other causes.	There were differences in the types of neurodegenerative diseases that were elevated among groups of healthcare workers. For example, veterinarians had elevated mortality risks for Alzheimer's disease and motor neurone disease, whereas physicians had elevated risk of presenile dementia.
Alessio et al. (2006)	Musculoskeletal and skin disorders were most prominent in both groups.	There was a trend toward higher rates of fitness for work among veterinary workers than human healthcare workers.
Gilmore et al. (2007)	Veterinarians and fire/EMT personnel were similar in having the least planning to manage epidemics, WMD events, or natural catastrophes, compared to other professional groups like physicians, nurses, and public health professionals.	Veterinarians had lower levels of emergency preparedness than other healthcare workers. Public health and medical care respondents provided the highest ratings in most areas of preparedness.
Meltzer et al. (2008)	Health professionals (including veterinarians) had the highest likelihood that death would be by suicide than other causes, compared with occupations not related to healthcare.	Male dental practitioners, male and female medical practitioners, and female veterinarians were the main contributors to high suicide risk among health professionals. Female veterinarians had a much higher suicide risk than the abovementioned human healthcare worker groups.
Bartram and Baldwin (2010)	– Human and veterinary healthcare workers had similar risk of suicide by self-poisoning and preference for barbiturates. – Veterinary and human healthcare students reported difficulties adjusting their academic expectations when faced with high-performing peers. – Female veterinarians and physicians had higher suicide risk than males and women in both groups had stronger preference for self-poisoning. This pattern was more pronounced in veterinarians and physicians than the general population.	None specified (but female and male veterinarians have similar suicide rates, in contrast to the general population where the male suicide rate is much higher).
Skegg et al. (2010)	Most health professions (including veterinarians) were not at high risk of suicide, though doctors, nurses, pharmacists, and veterinarians were more likely than other professions to choose poisoning as a suicide method.	Human nurses (both male and female) and female pharmacists had higher suicide risk than other health occupations, including veterinarians.

(*Continued*)

Table 4. (Continued).

Citation	Similarities	Differences
Pittenger (2011, 2013)	– Veterinary and some human health students (pharmacy and nursing) felt their professions were undervalued and misunderstood by other health professionals and the public. These students felt responsible for representing their professions well. – Students from all health schools expressed positive feedback about the social networking experience of interprofessional education and positive attitudes toward collaboration.	None specified.
Nunes et al. (2011)	Empathy declined over the first year of study for all health disciplines.	Pharmacy and veterinary students had lower initial empathy scores than nursing, dental, and medical students, and their empathy scores showed little change over the first year, in contrast to the declines observed in the other health disciplines.
Hawton et al. (2011)	None specified.	– Nurses, physicians, dentists, and pharmacists variously showed elevated risk of suicide compared with the general population and teachers; veterinarians did not. – There was some evidence that veterinarians used firearms for suicide more than other occupational groups.
Villablanca et al. (2011)	– Women tended to be younger than men in the School of Medicine and School of Veterinary Medicine. Both schools had more than a third of the faculty with a length of appointment of only 1–5 years. – Similar proportions of men and women in both schools reported family care responsibilities other than children and ranked their family responsibilities as similarly demanding. – Awareness of family-friendly policies was low, women were more aware than men, and women used family-friendly policies more than men in both schools. – A large proportion of faculty in both schools who took time off reported taking less time than needed, particularly men. Faculty from both schools reported similar barriers to using family-friendly policies. – The schools had similar levels of career satisfaction among faculty.	– A greater proportion of women than men did not have children or had fewer children than they desired in the School of Medicine. This was not the case for the School of Veterinary Medicine. – The School of Medicine had the lowest use of family-friendly policies. – Women in Veterinary Medicine reported lower perceived fairness in the implementation of family-friendly policies compared with men, a trend not seen in the School of Medicine.
Roberts et al. (2013)	– Veterinarians, pharmacists, dentists, doctors, and radiographers were among the top 30 occupations with the highest suicide rates, and veterinarians and pharmacists were in the top 5 (1 and 4, respectively). – Suicide rates for radiographers, veterinarians, pharmacists, doctors, and dentists reduced over time (though they remained high risk).	Veterinarians had the highest suicide rates, compared with human healthcare professions and other professions in the general population.
Winer et al. (2015)	There were similar patterns in opinions on One Health and the perceived benefits of an interprofessional education exercise between human and veterinary medical students, including improved communication skills and confidence in their ability to contribute in interprofessional settings.	More veterinary students than medical students agreed on the benefits of collaboration, and a greater proportion of veterinary students than medical students saw One Health as relevant to their intended profession.
Ward and McMurray (2015)	– Health workers, including veterinarians, medical receptionists, and home care workers, reported being abused by customers. Their organisations constrained their emotional and problem-solving responses to abuse. – Health workers from many human and animal-related disciplines hid their emotions as part of providing care and described the identity consequences of this. – Human and veterinary health workers comforted bereaved clients and found meaning and pride in this work. – Health workers of all types reported prior socialisation or exposure that added to their professional learning and equipped them with the emotional capacity to cope with difficult professional situations (e.g., exposure to sick pets for vets; exposure to dead humans for nurses).	None specified.
Pilgrim et al. (2017)	Veterinarians and anaesthetists had the highest mortality rates from drug-caused deaths (though veterinarians were slightly higher than anaesthetists) and various health professions had similar patterns relating to intent (e.g., intentional self-harm was highest in the veterinary and psychology/psychiatry groups).	Veterinarians most often used alcohol and barbiturates, whereas other health workers most often used antidepressants, antipsychotics, benzodiazepines, and opioids. Drugs obtained in the workplace were also different for veterinarians and other health professionals: mostly anaesthetics for medical practitioners and nurses, followed by opioids, whereas pentobarbitone and phenobarbitone (drugs used for euthanasia of animals) were involved in almost every veterinarian death.
Verrinder et al. (2016)	Overall, most students regardless of discipline prioritised deontological reasoning over utilitarian, care, and virtue ethics. Principled reasoning and universal principles were prioritised by students of animal-related and non-animal-related fields when considering ethical scenarios involving animals but not humans.	There were demographic differences between students of animal- and human-related fields: Medicine students had the highest median age; animal-related students were predominantly female; the gender split in medicine was more even.

(*Continued*)

Table 4. (Continued).

Citation	Similarities	Differences
Labbafinejad et al. (2016)	Medical and veterinary students have demanding programs that may negatively impact their quality of life. Stressors include heavy workload, fear of failure, and exposure to death/disease.	Overall, veterinary students had lower perceived quality of life than medical students, except that veterinary students reported higher social function than medical students.
Lewis and Cardwell (2019)	Medicine, pharmacy, dentistry, and veterinary students had lower wellbeing, greater distress, and more suicidal ideation than the general population.	Medical students had the highest rate of suicidal ideation and attempts, dentistry students had the lowest, and veterinary students reported comparatively better mental health.
Lewis and Cardwell (2020)	Neuroticism was the most powerful predictor of psychological dysfunction, and levels of neuroticism did not differ among the five student groups.	– Pharmacy students had lower openness to experience than veterinary students, while veterinary students had lower perfectionism than all other groups. – Medical students had the highest levels of extraversion and pharmacy students the lowest..
Bauer et al. (2019)	Painful and provocative events (PPES) and acquired capability for suicide (ACS) were not significantly correlated with prior suicide attempts in physicians and veterinary students, and increased exposure to PPES did not lead to significant increases in ACS over time in either group.	There was stronger evidence that PPEs predict ACS in physicians than there was for veterinary students.
Knipe et al. (2018)	Trends in mental health outcomes were similar for veterinary, medicine, dental students.	Veterinary students reported lower wellbeing than medical students.
Penix et al. (2019)	– Similar proportions of veterinary and nonveterinary health personnel reported suicidal ideation, depression symptoms, and were at risk of major depressive disorder. – Similar proportions of veterinary and nonveterinary personnel were also at risk of PTSD, and the two groups reported comparable levels of PTSD symptoms. – Self-care, team support, and perceived leadership were significantly correlated with lower behavioral health symptoms for both groups.	– A larger proportion of veterinary personnel were at risk of generalised anxiety disorder than were nonveterinary health personnel. – Veterinary personnel reported more severe secondary traumatic stress symptoms and more anger reactions than nonveterinary personnel. – Veterinary personnel reported engagement in and exposure to fewer protective factors than nonveterinary health personnel.
Ozlek et al. (2019)	Medicine, dentistry and veterinary medicine students tended to report lower dental anxiety than students of non-healthcare disciplines.	None specified.
Sa et al. (2019)	Students from six health programs, including veterinary medicine, showed similar levels of self-esteem, emotional intelligence, and empathy, with trends toward low self-esteem.	None specified.
Yang et al. (2019)	Female Doctor of Veterinary Medicine (DVM) students had higher psychological distress than their male counterparts, consistent with the general population, practising veterinarians, and medical students.	DVM students reported significantly higher levels of stress than the general Australian population, practising veterinarians, Junior Medical Officers, and medical students.
Alshaiji (2020)	– Human and veterinary healthcare workers reported similar levels of emotional exhaustion and depersonalisation; doctors of human and veterinary medicine reported higher depersonalisation rates than nurses/technicians in their respective fields. – Human and veterinary healthcare workers showed similar effects of learning behaviors on burnout experiences; participants engaging in more proactive behaviors tended to experience lower rates of burnout regardless of profession.	Human healthcare workers reported higher personal accomplishment than veterinary healthcare workers, on average.
Chen et al. (2020)	None specified.	None specified.
Chattu et al. (2020)	None specified.	Veterinary students reported higher physical wellbeing and lower psychological, social, and environmental wellbeing than other healthcare student groups.
Hoying et al. (2020)	Within all health schools, there was similar prevalence of moderately severe or severe symptoms of depression and anxiety. School did not predict the likelihood of depression or anxiety.	None specified.
Samara et al. (2020)	School of study was not identified as an independent risk factor for smoking.	Medical students had the lowest smoking rates of 17%, compared with 23.8% of veterinary students.
Hancock (2021)	None specified.	Medical students had a higher level of tolerance to ambiguity compared to veterinary students (though the effect was small).
Yu et al. (2021)	The overall level of COVID stress did not differ among students of veterinary medicine, medicine, and nursing. Students from all schools were mostly likely to be stressed about family members becoming infected with COVID, societal responses to COVID, curriculum schedule changes, and school examinations.	Nursing students were more likely than veterinary and medical students to report high levels of stress over access to PPE, childcare and schooling.
Rivera et al. (2021)	Levels of behavioral health and sleep problems, and trends in relationships among variables, were mostly similar for veterinary technicians and medics.	– Veterinarians had higher prevalences and odds of experiencing adverse behavioral outcomes than officers in human healthcare. – Psychotropic medication use was significantly lower for veterinary technicians than for medics.
Oliveira Lima et al. (2022)	The sample of human and animal health students had a high prevalence of burnout overall, compared with previous studies.	Veterinary medicine had the highest proportion of students showing signs of burnout, compared with students in human healthcare schools.
Holowaychuk and Lamb (2023)	None specified.	Veterinary workers had higher emotional exhaustion and depersonalisation, and lower personal accomplishment, than emergency department personnel in human healthcare.

(*Continued*)

Table 4. (Continued).

Citation	Similarities	Differences
Zimmermann et al. (2023)	– Female physicians, dentists, veterinarians, and pharmacists had increased risk of suicide. – Poisoning was the most common method of suicide used by physicians, pharmacists, and veterinarians, contrary to the general population and dentists, who most commonly used strangulation.	Veterinarians were the only profession with significantly elevated suicide risk for both genders.
Feakes et al. (2023)	– Veterinary and nursing studies were dominated by women (more so for nursing). – High other-orientation and low self-interest were frequently found in veterinary science and nursing students.	Overall, veterinary students were less prosocial, less other-oriented, more self-interested, and saw income as more important than did nursing students.
Steffey et al. (2023)	Physicians and veterinarians (including trainees) conduct work that requires sleep deprivation (e.g., on-call duties, long and overnight shifts).	In the USA, veterinarians have fewer workplace protections against fatigue than physicians and are thus at higher risk of excessive work hour requirements. There is also less evidence concerning the outcomes of fatigue in veterinarians than there is for physicians.
Adin et al. (2023)	Human and veterinary healthcare workers made medical errors. Prescription errors and errors not causing harm were more common than serious errors.	– Veterinary faculty had higher rates of burnout and lower rates of professional fulfillment than academic physicians. – Burnout was associated with medical errors for academic physicians and not for veterinarians.
Robiner et al. (2023)	For most health professions, women comprised the most homicides (though the professions were also female-dominated), with the exception of dentists, nonpsychiatric physicians, and psychiatrists.	Veterinarians had the least number of homicides and lowest homicide rates compared with human healthcare professionals. Human nurses had the highest.
Haas et al. (2023)	Students expressed their desire for additional guidance relating to career services, academic support, networking, and field experiences, regardless of whether they were studying veterinary medicine or public health only.	Students of veterinary medicine/public health reported greater knowledge in public health competencies like disease measurement, epidemiological inferences, and ethical/legal principles than students of public health only.

Employment conditions were also compared through a narrative review (Steffey et al., 2023). Veterinarians and physicians shared the requirement to work long, overnight, and on-call shifts, although veterinarians had fewer workplace protections than physicians in the USA.

Discussion

We aimed to support interprofessional learning on an important issue within the One Health workforce through a scoping review of investigations into wellbeing among human and veterinary healthcare workers concurrently. We identified 47 relevant sources spanning 54 years, reflecting a longstanding recognition of the parallels between human and animal health (Pettan-Brewer et al., 2024). Most of these investigations employed cross-sectional, survey-based designs with samples of veterinarians, physicians, nurses, dentists, and pharmacists in education and practice settings, often in the USA. Mental ill-health was the most frequently studied wellbeing-related factor, although earlier studies more often examined professional contexts and physical health. Comparisons of human and veterinary healthcare workers related to their health, personal traits and attributes, and professional contexts. These comparisons yielded few clear patterns of findings, although there were some areas of consistency, primarily demonstrating likenesses between the two groups. These results point to important knowledge gaps and implications for future research and interprofessional learning.

The literature reporting comparisons of human and veterinary healthcare workers' mental health yielded inconsistent findings. These inconsistencies may stem from the variety of psychological disorders, measurement instruments, health professions, and occupational contexts that were investigated, as well as the absence of theoretical frameworks underpinning many studies. Such limitations reflect broader issues in psychological research, where reliance on single studies to answer complex questions has hampered incremental knowledge-building (Schmidt & Oh, 2016). Despite these limitations, included studies consistently highlighted mental ill-health as an important challenge for providers of human and animal healthcare.

Physical hazards were also examined. These investigations were more common prior to 2005 than after, possibly reflecting a broader shift in focus away from physical hazards toward psychosocial risks in occupational safety research (Hofmann et al., 2017). Included studies identified overlapping physical health outcomes for human and veterinary healthcare workers, but the nature and severity of these outcomes varied across professions. Investigating the reasons for these differences could reveal information on each profession's strategies for managing similar risks, enabling the most effective approaches to be adapted for use by other health professions.

Evidence on the personal traits and attributes of human and veterinary healthcare workers was also mixed. This research exclusively focused on students, who were mostly similar across disciplines when considering traits like personality and empathy, and attitudes toward their studies and professions. However, small differences emerged, which could be influenced by contextual factors. Given evidence linking such traits with overall wellbeing (Anglim et al., 2020), also reflected in included studies that reported links between neuroticism and wellbeing (Bartram & Baldwin, 2010; Lewis & Cardwell, 2020), these contextual influences are worth exploring further.

Gender was another frequently studied attribute of human and veterinary healthcare workers. Multiple sources agreed that women in healthcare faced higher risk of suicide than women in general. This elevated risk could stem from preexisting

Table 5. Content analysis of similarities and differences between human and veterinary healthcare workers.

Theme	Subtheme	Sources
No differences highlighted.	N/A	Chen et al. (2020); Hoying et al. (2020); Ozlek et al. (2019); Pittenger (2011), 2013; Sa et al. (2019); Ward & McMurray (2015)
No similarities highlighted.	N/A	Chattu et al. (2020); Chen et al. (2020); Hancock (2021); Hawton et al. (2011); Henderson (1969); Holowaychuk and Lamb (2023); Lange et al. (1992); Schulte et al. (1996)
Health. Comparisons of human and veterinary healthcare workers' physical, mental, or social wellbeing.	***Mental health.*** Similarities and differences in human and veterinary healthcare workers' psychological states.	***Similarities* (*n* = 20)**. Alshaiji (2020); Fishbain (1986); Hoying et al. (2020); Knipe et al. (2018); Lewis & Cardwell, 2018; Oliveira Lima et al. (2022); Penix et al. (2019); Rivera et al. (2021); Yang et al. (2019); Yu et al. (2021)
		Suicide (*n* = 10). Bartram and Baldwin (2010); Bauer et al. (2019); Charlton (1995); Meltzer et al. (2008); Penix et al. (2019); Pilgrim et al. (2017); Roberts et al. (2013); Skegg et al. (2010); Zimmermann et al. (2023)
		***Differences* (*n* = 21)**. Adin et al. (2023); Chattu et al. (2020); Holowaychuk & Lamb (2023); Knipe et al. (2018); Labbafinejad et al. (2016); Oliveira Lima et al. (2022); Penix et al. (2019); Rivera et al. (2021); Yang et al. (2019); Yu et al. (2021)
		Suicide (*n* = 11). Bartram and Baldwin (2010); Bauer et al. (2019); Charlton (1995); Hawton et al. (2011); Lange et al. (1992); Lewis and Cardwell (2019); Meltzer et al. (2008); Pilgrim et al. (2017); Roberts et al. (2013); Skegg et al. (2010); Zimmermann et al. (2023)
	Physical health. Similarities and differences in human and veterinary healthcare workers' physical wellbeing.	***Similarities* (n =6)**. Alessio et al. (2006); McDevitt (1973); Park et al. (2005); Rivera et al. (2021); Steffey et al. (2023); Van Doorn (1995)
		***Differences* (n = 10)**. Alessio et al. (2006); Chattu et al. (2020); Fishbain (1986); Henderson (1969); Lange et al. (1992); McDevitt (1973); Park et al. (2005); Robiner et al. (2023); Schulte et al. (1996); Van Doorn (1995)
	Health behaviours. Similarities and differences relating to the health-influencing actions of human and veterinary healthcare workers.	***Similarities* (n = 4)**. Fishbain (1986); Ozlek et al. (2019); Penix et al. (2019); Samara et al. (2020)
		***Differences* (n =3)**. Fishbain (1986); Rivera et al. (2021); Samara et al. (2020)
Personal Traits and Attributes. Comparisons of human and veterinary healthcare workers' defining characteristics.	***Psychological Traits.*** Patterns of thoughts, feelings, and cognitions where similarities between human and veterinary healthcare workers were highlighted.	***Similarities* (n =6)**. Alshaiji (2020); Feakes et al. (2023); Lewis and Cardwell (2020); Nunes et al. (2011); Sa et al. (2019); Verrinder et al. (2016)
		***Differences* (n =4)**. Feakes et al. (2023); Hancock (2021); Lewis and Cardwell (2020); Nunes et al. (2011)
	Attitudes. Human and veterinary healthcare workers' opinions, beliefs, and evaluations.	***Similarities* (n =5)**. Bartram and Baldwin (2010); Flint (1980); Pittenger (2011, 2013); Ward & McMurray (2015); Winer et al. (2015)
		***Differences* (n =8)**. Adin et al. (2023); Alshaiji (2020); Feakes et al. (2023); Flint (1980); Haas et al. (2023); Villablanca et al. (2011); Winer et al. (2015)
	Demographic Patterns. Human and veterinary healthcare workers' social and economic attributes.	***Similarities* (n = 2)**. Flint (1980); Villablanca et al. (2011)
		***Differences* (n =8)**. Bartram and Baldwin (2010); Fishbain (1986); Meltzer et al. (2008); Skegg et al. (2010); Verrinder et al. (2016); Villablanca et al. (2011); Zimmermann et al. (2023)
Professional Contexts. Comparisons of the environments within which human and veterinary healthcare workers practice	N/A	***Similarities* (n =10)**. Adin et al. (2023); Gilmore et al. (2007); Haas et al. (2023); Labbafinejad et al. (2016); Penix et al. (2019); Steffey et al. (2023); Van Doorn (1995); Villablanca et al. (2011); Ward and McMurray (2015); Yu et al. (2021)
		***Differences* (n =6)**. Adin et al. (2023); Gilmore et al. (2007); Steffey et al. (2023); Van Doorn (1995); Villablanca et al. (2011); Yu et al. (2021)

vulnerabilities, with women generally more likely than men to experience mental disorders (Australian Bureau of Statistics, 2023). These vulnerabilities may be compounded by another trend: human and veterinary healthcare workers often access lethal means through their workplaces. It is therefore possible that women in healthcare share vulnerabilities with women in the general population but face heightened suicide risk due to their professional knowledge and access to suicide means. Addressing this possibility calls for consultation between the human and veterinary healthcare sectors so that successful strategies for controlling occupational access to lethal means can be developed and shared.

Mental ill-health among human and veterinary healthcare providers could also arise from the numerous stressors

they share. Included evidence suggested several similarities between professional contexts in the two sectors, with both groups facing emotional strain, high workloads, long hours, overnight shifts, and on-call responsibilities. These findings align with prior research on workplace stressors in various healthcare settings (e.g., De Vries et al., 2023) and highlight another opportunity for knowledge exchange between the human and veterinary health sectors.

Our review of wellbeing-related research in concurrent samples of human and veterinary healthcare workers identified shared characteristics, highlighting the potential for interprofessional learning that could benefit both sectors. Our review also revealed some knowledge gaps that should be addressed to ensure these initiatives are informed by the best available evidence.

Recommendations for future research

A key gap in the literature arose from its focus on mental ill-health. This focus reflects a broader emphasis on psychopathology in research on wellbeing in health occupations (Clise et al., 2021), which overlooks conceptualsations of vocational wellbeing as multifaceted (e.g., Brigham et al., 2018; Donaldson & Donaldson, 2021). Few included studies considered this expanded perspective, leaving gaps in understanding the factors that influence wellbeing among healthcare workers. Research grounded in theory and incorporating a holistic view of wellbeing could facilitate more effective knowledge exchange between human and veterinary healthcare workers by generating a comprehensive picture of opportunities for learning between them.

A second knowledge gap arose from a narrow focus on certain health professions. Specifically, evidence from veterinary healthcare largely overlooked professionals other than veterinarians, even though such professionals form a critical component of animal health workforces (Cobbold et al., 2020). These roles differ from veterinarians, just as many human healthcare roles differ from physicians, yet there was no evidence comparing analogous non-physician roles across human and veterinary healthcare. Addressing this gap by researching a wider variety of veterinary healthcare workers and comparing them with their counterparts in human healthcare could provide valuable insights into opportunities for interprofessional learning.

Focusing on a narrow range of health professionals may have also contributed to a gap in understanding the role of gender. Women constitute a majority in healthcare workforces (Boniol et al., 2019; Knights & Clarke, 2019), but this proportion was not reflected in the included samples. This mismatch may have arisen from a focus on professions historically dominated by men. More comprehensive knowledge on gendered experiences of wellbeing in healthcare could be achieved by expanding the representation of professions in future research. Doing so may present opportunities for the veterinary and human medical professions to better support the growing proportions of women in their workforces using insights from professions with established histories of doing the same.

Another sampling issue within the included literature arose from the high proportion of studies conducted in the USA. This predominance of American studies reflects a tendency for occupational safety and One Health research to neglect investigations in low- and middle-income countries (LMICs; Owie & Apanga, 2016; Szomszor et al., 2025). This geographic bias represents a significant knowledge gap, as conditions affecting vocational wellbeing among healthcare workers in LMICs cannot be assumed to mirror those in high-income, Western contexts (Owie & Apanga, 2016). Given that poor wellbeing contributes to health workforce shortages (Arbe Montoya et al., 2021; Ocean & Meyer, 2023), this knowledge gap may interfere with core One Health objectives that emphasise capacity-building in LMICs (FAO, UNEP, WHO, WOAH , 2022). Strengthening the evidence on wellbeing among human and veterinary healthcare workers in LMICs is therefore essential to achieving One Health goals.

Findings from studies conducted in the USA may also fail to translate to other high-income, Western contexts. The USA's human health system is atypical by global standards (Ridic et al., 2012), so findings from comparisons of American human and veterinary healthcare workers may not apply to other contexts. This gap also represents an opportunity for future research. Veterinary health systems are largely privatised and operate in similar ways to the USA's human health system. Therefore, differences between workers in the USA and those in other countries may help to identify systemic issues impacting professional wellbeing in healthcare.

A final limitation of the included evidence arose from the predominance of cross-sectional, survey-based research designs. Such designs are cost-effective (Connelly, 2016), an important consideration given that most included investigations did not specify a funding source. However, cross-sectional survey studies are limited by their reliance on potentially inaccurate self-reported data, susceptibility to non-response bias, and inability to capture changes over time (Connelly, 2016). As such, it is important that future examinations of wellbeing among human and veterinary healthcare workers employ alternative methodologies. Longitudinal studies that track the already prevalent student samples from training through practice may be particularly valuable.

These limitations made it difficult to identify trends in the available evidence. However, we were able to detect some points of consistency to inform initial recommendations for interprofessional knowledge sharing on wellbeing within the One Health workforce.

Recommendations for interprofessional learning

Authors of included studies reported several common factors likely affecting wellbeing among human and veterinary healthcare workers. Some healthcare professions may manage these factors more effectively than others, presenting opportunities for interprofessional learning. For example, debriefing sessions are widely used in human healthcare, allowing researchers to establish evidence on the characteristics that enhance debriefing effectiveness (Evans et al., 2023). Debriefing has also been recognised as potentially valuable for veterinary workplaces (Kahler, 2014), where it has not been adopted as widely as in human healthcare. Those seeking to implement debriefing in

veterinary contexts could therefore benefit from insights gained from similar initiatives in human healthcare.

The extent to which such strategies can be successfully adapted across professions may depend on institutional support. We observed an increase in the frequency of publications meeting our criteria from 2005 onwards, coinciding with the popularisation of One Health around 2004 (Pettan-Brewer et al., 2024). This movement may have contributed to more prevalent research encompassing human and veterinary health practitioners around this time. This expanded acceptance of One Health also led to a partnership between the American Veterinary Medical Association and American Medical Association (Pettan-Brewer et al., 2024), which may offer another explanation for the large proportion of US-based sources included in our review. These developments highlight the potential for professional associations to drive interprofessional research and knowledge exchange on wellbeing within the One Health workforce.

Limitations

Limiting the included studies to those published in English may have contributed to the predominance of research examining samples of healthcare workers from high-income, Western populations. While this limitation was unavoidable, future efforts to characterise the evidence in this area could benefit from incorporating sources in other languages. Additionally, scoping reviews are valuable for initial mapping of literature on broad subjects, consistent with our aim, but do not allow for in-depth quality assessment or further analysis of prior findings. Future researchers could build on our work using systematic or meta-analytic techniques to examine heterogeneity within the human and veterinary healthcare sectors and clarify factors influencing wellbeing outcomes.

Conclusions

Our review revealed knowledge gaps that should be addressed to strengthen the evidence underscoring mutual learning between the human and veterinary healthcare sectors on vocational issues. Such approaches could benefit from insights into strategies that have proven effective in one field but remain underutilised in the others. Supporting knowledge exchange to address common challenges among human and veterinary healthcare workers may ultimately enhance wellbeing for members of both groups and contribute to a more resilient One Health workforce.

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Author contributions

CRediT: **Nicola K. Paul:** Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Visualization, Writing – original draft; **Amy D. Lykins:** Conceptualization, Methodology, Supervision, Writing – review & editing; **Jay Meynadier:** Investigation, Methodology, Writing – review & editing; **Sujana Adapa:** Conceptualization, Methodology, Supervision, Writing – review & editing.

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Notes on contributors

Nicola K. Paul is a researcher at the University of New England, Australia. As a former veterinary nurse, she has an interest in anthrozoology and the development of organisational and policy interventions to support sustainable care workforces. Her research focuses on occupational stressors in veterinary and human healthcare, human-animal bonds, and interactions among human, animal and environmental welfare.

Amy D. Lykins is Professor of Clinical Psychology at the University of New England (UNE). Her research examines the intersections of environmental change, human behaviour, and mental health, including climate change impacts, pro-environmental behaviour, and interventions to support individual and community wellbeing faced with extreme weather events. She also has strong research interests in human-animal interactions in both personal and occupational settings.

Jai Meynadier is a Lecturer in the School of Psychology at the University of New England, Australia. His research interests lie in the area of problematic social media use, addictive behaviour, and mindfulness.

Sujana Adapa is Professor in Management (Strategy and Marketing) in the UNE Business School at the University of New England. She teaches a range of marketing units, including Introduction to Marketing, Services Marketing, Strategic Marketing, and Consumer Behaviour. Her research focuses on small and medium sized regional firms, corporate social responsibility, innovation adoption, destination branding, and cross-cultural consumer behaviour.

ORCID

Nicola K. Paul http://orcid.org/0000-0001-8423-8742
Amy D. Lykins http://orcid.org/0000-0003-2930-3964
Jay Meynadier http://orcid.org/0000-0002-9493-6998
Sujana Adapa http://orcid.org/0000-0002-4385-1783

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