

Integrating resources for well-being in veterinary students and graduates: contextualizing contemporary literature

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Abstract

Mental ill-being in veterinary professionals is well described, and there are decades of scholarship and strategies aimed at preventing these outcomes. These efforts are impactful and important, but there is a critical need to balance the prevention of mental ill-being with the promotion of mental well-being in veterinary students and graduates. In 2017, the *Journal of Veterinary Medical Education* challenged veterinary scholars and educators to use positive psychology to foster and understand professional well-being. This literature review includes papers that accepted this challenge: descriptive peer-reviewed studies published between 2017 and 2024 that evaluate positive mental health outcomes in veterinary students and graduates. Twenty studies (quantitative, $n = 12$; qualitative, 7; and mixed, 1) evaluating students (13), graduates (6), or both (1) are included. The results of these studies are assimilated to (1) describe resources for well-being, (2) highlight discrepancies between the reported importance of these resources, and (3) provide 4 opportunities to integrate resources for well-being including professional competencies, mentorship, promoting help seeking, and leveraging student and graduate motivators. Overall, this literature review contextualizes our understanding of strategies that promote veterinary professional well-being and balances the deficit-minded narrative that has dominated our understanding of veterinary student and graduate mental health for decades. However, meaningful attention to student or graduate identity is notably lacking. Veterinary students and graduates are not monolithic, and future work must disaggregate student identity when considering strategies for well-being to promote true equity in veterinary student and graduate well-being.

Keywords: well-being, veterinary students, ill-being, veterinary education, mental health

Mental Health of Veterinary Professionals

Veterinary students and graduates face numerous professional demands, including substantial academic, time, financial, and emotional commitments. Individuals make these commitments because they are passionate about animals, service, science, and learning. Professional well-being depends on a positive balance between job demands and job resources, and the more demands a profession has, the more robust the available resources must be.¹⁻³ As early as the 1980s, there has been evidence that veterinary professionals are vulnerable to mental ill-being because these professional demands and resources are not balanced.⁴ Veterinarians are up to 4 times more likely to commit suicide than the general public, and over 60% of veterinarians have contemplated suicide.^{5,6} Over 30% of graduated veterinarians⁷ and

60% of veterinary students report depression.^{1,8} Over the past several decades, the important issue of mental ill-being in veterinary graduates and students has been a scholarly and professional priority.¹

A Call to Accentuate the Positive

Strategies to understand and prevent mental ill-being have become commonplace in veterinary academic and professional contexts. Although well intended, this deficit focus prompts concern that the profession has overcorrected and is teaching students why not to be veterinarians.⁹ Scholars contend that overemphasizing ill-being in the veterinary profession evokes human attention bias and may be self-fulfilling. Instead, they argue that veterinary educators, scholars, and leaders should balance professional strategies to mitigate mental ill-being with ones that promote mental well-being.^{1,9} This has created momentum to reframe mental health within the veterinary profession using a positive psychology lens.

In 2017, the *Journal of Veterinary Medical Education* published an issue that specifically highlighted scholarship on mental well-being in

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veterinary students and graduates. The opening editorial of this issue theorizes that “while, for obvious reasons, much of the published research in the area of mental health and well-being focuses on reporting the problem and reducing the stressors (rain), an alternative approach is to focus on how we can build resilience and nurture well-being (the umbrella)—that is, how can we develop better umbrellas to help students protect themselves from the rain?”¹⁰ A literature review of veterinary mental health scholarship from 2000 to 2017 found that mention of mental ill-being (ie, stress) outnumbered mental well-being (ie, resilience) 2-fold and created a “taxonomy of illness [with] methodologic bias toward identifying the risk factors for mental health problems with only a shallow exploration of well-being or resilience factors.”¹ These, and other publications within this issue, present a call to arms to balance the scholarly narratives of mental ill-being and well-being in veterinary professionals.^{1,10}

Has veterinary scholarship and practice answered this call? In this literature review, I will contextualize contemporary literature that evaluates the well-being of veterinary graduates and students to answer this question. Specifically, I will define and describe factors associated with well-being in veterinary graduates and students and synthesize cohesive threads and areas of contradiction and opportunity within the existing literature. Two main themes will be discussed: (1) the resources that promote well-being, and (2) how these resources can be integrated. Suggestions for future scholarship are also included.

Included literature

The review includes descriptive, peer-reviewed literature published during or after 2017 that evaluates positive mental health outcomes in veterinary graduates or students. This scholarly work is interdisciplinary, and several databases (PubMed, Google Scholar, and ERIC) were searched using the terms *veterinarian** plus any of the following: resilience, self-efficacy, well-being, wellness, mindset, and positive. This resulted in an initial list of relevant articles, and the reference list of each article was evaluated for additional sources. Literature outside the inclusion criteria was included if it provided background context on veterinary mental health. This literature review specifically focused on descriptive studies because this knowledge is requisite for higher order, interventional, or normative scholarly inquiry.

Twenty peer-reviewed publications^{1-3,11-27} met the inclusion criteria for this review and evaluated mental health outcomes in veterinary students ($n = 13$),^{11,13,15-19,22,24-27} veterinarians (6),^{2,3,12,14,20,23} or both (1)¹ using quantitative (12),^{12-15,17,18,20,21,24-27} qualitative (7),^{2,3,6,11,16,19,22} or mixed methods (1).²³ All but one article¹⁷ reported participant binary biological sex, and another article reported demographic variables were age ($n = 9$),^{13,18,19,21-25,27} relationship status (6),^{18,20,22,24-26} race/ethnicity (6),^{11,15,18,24-26} and being a parent (3).^{20,25,26} Only one study allowed participants to express nonbinary gender, and another

study included sexual orientation.²⁵ Females were overrepresented and comprised between 68% and 98% of participants.^{2,3,11-27} The percentage of female participants was subjectively higher in studies focused on veterinary students than in veterinary graduates, reflecting the changing professional gender demographic over the past several decades. Between 58% and 94% of participants were white.^{11,15,18,24-26}

The outcome measures reported in this literature set were broadly categorized into states of well-being (ie, thriving, hope, satisfaction, optimism, pleasure, resilience),^{1-3,11-18,20} coping mechanisms (ie, mindset, psychological capital, mindfulness),^{13-19,21-23} engagement or motivation,^{3,23} and help-seeking behaviors.²⁴⁻²⁷ Hereafter, these outcome measures will be collectively referred to as mental well-being. A specific facet of well-being will be referenced when applicable.

Resources for Well-Being in Veterinary Medicine

Literature in this review describes 2 main categories of resources that fortify or protect the well-being of veterinary professionals: personal and contextual resources. Personal resources are internal skills and strategies for overcoming challenges, including compassion, motivation, self-efficacy, reflection, autonomy, and competence.^{1,3} Contextual resources are externalities that make an environment easier to navigate. Veterinary examples include social support networks and access to mental health services.^{1,2,11,15,16,22,24,26}

Personal resources

Personal resources for well-being are valuable because they are within an individual's control and can be employed and deployed in any work environment.³ These resources fortify higher level psychological processes such as resilience,¹³ engagement,³ and overall well-being.¹⁷ A growth mindset is an important personal resource and predictive variable for veterinary student well-being in 3 publications.^{17,19,21} A growth mindset is an internal locus of control, and people with this mindset view challenges as opportunities for growth, not reflections of their abilities or intelligence.²¹ A growth mindset is associated with positive psychometric parameters, including mental health, autonomy, personal growth, positive relations with others, a sense of purpose, and self-acceptance.¹⁷ Individuals with a growth mindset may be more likely to engage with contextual resources such as mental health services.²⁶

Up to half of veterinary students demonstrate a fixed mindset and do not optimize their personal resources for success.^{17,19,21} A fixed mindset is more common in females, perfectionists, and individuals who are given performance-focused rather than goal-focused praise or are repeatedly labeled as “high-achieving.”^{17,19} Female students comprise approximately 80% of graduating veterinary classes, and perfectionism is a common trait in veterinarians. Systems within veterinary medicine can help promote a growth mindset in these students who may

be predisposed to fixed mindsets. This can include training on nonjudgemental and nonreactive mindfulness and self-compassion¹³ and making small linguistic changes to assessments and feedback so that they are intentionally goal oriented.

Contextual resources

Contextual resources leverage systemic and institutional structures to support well-being. When contextual resources are lacking, the burden of well-being disproportionately falls on students, and opportunities for systemic improvements are lost.¹⁵ Specific contextual resources that support veterinary student and graduate success are social climate, belonging, curricular support, and mental health support. Social climate and belonging are positively correlated with satisfaction and hope and negatively correlated with frustration and mental ill-being in veterinary student populations. Veterinary student perception of social climate explains 44% and 34% of participant variance in satisfaction and frustration, respectively, and specifically 67% and 87% of the variance in hope and burnout, respectively.¹⁵ Veterinary student's perception of social climate also influences academic success.^{11,15,16,22}

Belonging is a basic psychological need that is derived from relatedness and connectedness^{15,22} and positively impacts veterinary students' well-being and tenacity during stressful points of the curriculum, such as objective structured clinical examinations.²² Conversely, the absence of belonging enhances fear of failure which contributes to academic encumbrances.²² Peer and professional support and mentorship fortify belonging in veterinary students. This support helps them overcome challenges, fosters a growth mindset,^{11,16} and promotes help seeking.²⁶ Students who feel welcomed into the veterinary profession are empowered, proud, and resilient against academic challenges.¹¹

Academic load, rigor, and assessment are well-defined and important stressors for veterinary students.¹⁶ There are several organizational strategies to minimize these stressors, including standardized organization of courses, clear learning objectives and assessment parameters, timely feedback, well-prepared and skilled educators with sufficient time to coach students through challenging material, and access to identity-affirming academic support.¹⁶ For many students, veterinary school is the first time they will need academic support. This is difficult to navigate and threatening, particularly for students who are perfectionists, high achieving, and have fixed mindsets.¹¹ Veterinary schools can foster well-being by institutionalizing robust student peer and faculty mentorship programs, leveraging curricular organizational strategies, prioritizing goal-based praise, and offering strategic touchpoints for mental health awareness and academic support.^{22,24}

The relative impact of resources

Scholarship that evaluates the effects of personal and contextual resources offers a deeper lens to contextualize the well-being of veterinary students

and graduates. Surprisingly, only 5 articles^{2,12,14,16,22} considered both personal and contextual resources as predictive variables for mental health outcomes. Matthew et al¹² created a validated resilience scale optimized for veterinary students or graduates and found that 13%, 72%, and 15% of veterinarians demonstrate low, medium, or high resilience using this metric. This scale was created using an exploratory analysis to serially remove personal and contextual resources from the model until the remaining resources explained 50% of the variance in resilience. Interestingly, only personal resources remained in the model and included flexibility, adaptability, optimism, growth mindset, motivation, and tenacity.

McArthur et al¹⁴ evaluated the association between personal resources and coping mechanisms on resilience and the likelihood of leaving the veterinary profession. Emotion-based coping, such as positively reframing a situation, was positively associated with resilience. Both problem-based coping (planning, working harder) and dysfunctional coping (denial, self-blame) were negatively associated with resilience. Thus, for veterinarians, a contextual, problem-focused approach to challenges (ie, planning and getting advice) may inhibit resilience as much as dysfunctional coping (ie, self-blame and giving up).¹⁴ One possible explanation for this is that problem-focused coping mechanisms create a false sense of control and promote a fixed mindset.

Both Matthew et al¹² and McArthur et al¹⁴ used quantitative methods to find associations between resources and well-being. They did not ask participants to rank or judge the importance of various contextual or personal resources. Thus these authors objectively compare the effect these resources have on resilience and independently highlight the importance of personal resources for well-being. In contrast, Clise et al,² Weston et al,¹⁶ and Sample et al²² worked qualitatively. They asked veterinary students or graduates to describe factors that influenced their stress levels or source of pleasure in veterinary work.

Weston et al¹⁶ asked students to develop a consensus on stress and stress management in veterinary medicine using the Delphi technique. Students identified personal resources as well as social, academic, and well-being support as important protective factors against stress. However, when asked to draft stress management solutions, students focused exclusively on organizational and institutional change and did not consider fortifying personal resources. Similarly, Clise et al² asked veterinarians to describe up to 10 sources of pleasure from their career: less than 3% of responses were related to personal resources. Veterinarians recognized externalities such as recognitions of professional expertise, positionality, job characteristics, relationships, and praise as sources of professional pleasure as opposed to personal resources, such as a sense of accomplishment and purpose.²

The conflicting findings within these studies suggest that even though personal resources have a stronger quantitative association with well-being, individuals qualitatively rely on systematic,

contextual resources to promote professional well-being. On the scholarly level, this dissonance is perpetuated by study design and allows investigations of professional well-being for veterinarians to operate in methodologic silos with separate perceived dominant driving forces. On the individual level, this observation suggests that veterinary students and graduates overestimate their dependence on contextual resources for well-being (or underestimate the power of personal resources).

Veterinary students and graduates may be at risk of feeling helplessness, anxiety, and depression if they believe their well-being is disproportionately dependent on external, contextual resources rather than personal ones.^{2,16} Clise et al² and Weston et al¹⁶ echo these concerns and documented that both veterinary students and graduates are more likely to attribute professional satisfaction and stress management to contextual resources compared to personal resources. Without proper attention to personal resources for well-being, veterinarians may become disproportionately, negatively impacted by inevitable hardships of the profession, such as challenging cases and poor patient outcomes.^{2,3} It is both necessary and possible to use contextual infrastructure to fortify personal resources for well-being by scaffolding organizational structures that promote personal resources and fortifying the importance of these personal resources within the professional culture.^{2,3}

Integrating Personal and Contextual Resources

Personal and contextual resources are both necessary but alone insufficient to foster professional wellness and engagement and should act synergistically.³ For example, peer-coaching systems effectively improve reflection, a personal resource correlated with engagement and extra-role behaviors, such as volunteering to provide peer coaching.³ The interplay between personal and contextual resources is conceptualized into a framework called the job demands-resources model.^{2,3,9} In this model, positive professional outcomes occur when there are more job resources than demands. This model is particularly useful because it can include demands and resources specific to the investigated profession. Several of the included studies¹⁻³ used this model to provide a balanced narrative of mental health in the veterinary profession, and it should be considered for future well-being scholarship.

Systems within veterinary medicine must be designed to fortify the well-being of students and graduates, and the professional culture must fully adopt this need. Students view the university as responsible for their academic training, not holistic well-being,¹¹ and yet, “veterinary medical educators are positioned at the heart of [the mental health problem in the profession], taking students into intensive programs and sending them out as graduates into a profession featured regularly in the literature as having a problem with mental health, and well-being and, at the extreme, with higher rates of suicide ideation than other professions.”¹⁰

Personal and contextual resources for well-being fortify one another, and the remainder of this review will describe 4 main strategies to integrate these resources and provide holistic scaffolds of support for veterinary student and graduate well-being: (1) professional competencies, (2) mentorship, (3) facilitating help seeking, and (4) leveraging motivations.

Professional competencies

Modern veterinary medical curricula are competency based, which provides an opportunity to institutionalize personal resources as necessary professional skills. Framing capacities such as resilience, self-compassion, and mindfulness as learnable skills promote a growth mindset culture. Additionally, assessment of skill and knowledge-based competencies should leverage goal- and progress-oriented language to promote growth mindsets. Small linguistic changes in assessments can facilitate this, but this opportunity is easy to overlook.

It is beyond the scope of this literature review to evaluate each published national veterinary competency list; however, in 2024, the American Association of Veterinary Medical Colleges launched an updated competency framework that included a professional identity domain of competency with subcompetencies related to professional development and wellness.²⁸ Including personal resources as core competencies is necessary but not sufficient to fortify this skill set. These skills must be valued and integrated within the professional culture and modeled by veterinary educators and mentors, who need the training and time to instill them in future generations effectively.^{11,15,16} Without this cultural and infrastructural commitment, listing well-being competencies does little more than a virtue signal.

Mentorship

Social networks are central to professional identity development and belonging and have a strong qualitative association with resilience.^{2,11,16} Formal mentorship programs can institutionalize supportive social networks to facilitate belonging, identity development, and resilience. These programs should be directed toward students and new graduates and could cross-institutional, local, or national borders to provide a large peer and professional support network.

A strong professional identity is important for retention in science, technology, engineering, and math fields and is likely important for veterinary professionals as well.^{29,30} Mentorship helps students develop a professional identity by fostering a sense of belonging in the profession through a strong mentor relationship. Notably, only one article¹¹ included in this review specifically recruited students with diverse backgrounds to understand their sense of professional belonging. It is imperative that future scholarship and support initiatives understand how students and graduates with marginalized identities experience belonging and mentorship in the veterinary profession. This understanding is the first step toward creating supportive infrastructures, such as mentoring programs, that are relevant, equity-minded,

and support professional identity development in a diverse population of students and graduates.

Mentoring should include role modeling healthy behaviors, including personal and professional balance. It may be hard for students to recognize the degree of control they have over their own balance and well-being during an intensive academic program, and students may "...[tend] to put in a great intensity of effort during term time, followed by a similarly great intensity of socializing outside of term time, effectively describing a binge approach to life rather than a healthy balance. There was an element of postponing balance because of the temporary, means-to-an-end nature of the current situation."¹¹ Taking a binge or postponed approach to well-being undermines mindfulness and resilience.¹³ It is incumbent upon veterinary educators and leaders to be mentors and role models that promote and practice healthier, sustainable resources and habits that foster fulfilling personal and professional lives.^{11,15,16}

Help-seeking behaviors

Help-seeking behaviors rely on personal and contextual resources. Combined with levels of stress and anxiety, emotional transformation and behavioral competency explain 50% of the variance in help-seeking behaviors of veterinary students.²⁶ In 1 institution,²⁴ mental health treatment initiation and sustenance doubled over 1 decade, concurrent with increased in-house counseling support. Mentoring and counseling improve behavioral confidence in help-seeking behaviors as well as self-efficacy and internal dialogues for health.²⁶ Specifically, strong peer relationships may also foster help-seeking behaviors for students with mental health struggles and reduce stigma against mental health services.²⁶ As with mentorship, mental health services should be offered at transitory, high-stress touchpoints in a veterinary student and graduate's career trajectory.²⁴ Students with different backgrounds may have different cultural relationships with help seeking; thus, it is again imperative that scholars and educators understand how identity affects resource utilization to provide equity-minded support to students.^{11,24}

Motivation

Understanding what motivates veterinarians can help align these motivations with resources for well-being. Both veterinary students¹¹ and graduates²³ report animal and people-related vocational purpose and a deep-rooted vocational identity as a veterinarian, with little to no consideration of alternative careers, as strong external career motivators.^{11,23} People-centered purpose fortifies the importance of academic and professional belonging and mentorship.¹¹ In addition to external motivation through purpose, veterinary students and graduates are motivated by intrinsic features of the profession, including diverse opportunities, frequent opportunities for problem-solving, and lifelong learning.^{11,23} However, career motivators are not universal across veterinary students and graduates and may be associated with identity and experience. Female and

recently graduated veterinarians are more likely to express a strong animal orientation and vocational identity whereas more experienced veterinarians describe a shift toward people- and goal-oriented motivations.²³ Existing evidence suggests that veterinarians become more people- and goal-oriented over time.²³ It will be important for future well-being scholarship to explore how precisely these motivators change for veterinarians broadly and as individuals so that relevant resources are fortified across a career.²³

Seeking Eudaimonia

This literature review contextualizes a recent shift toward positive psychology approaches to investigate mental health outcomes in veterinary students and professionals. This has helped create a balanced narrative of the veterinary profession's demands and resources, allowing professionals to feel both affirmed and empowered. Over 2,000 years ago, Aristotle conceptualized this integration of challenge, empowerment, and purpose as eudaimonia. By his definition, eudaimonia comes from living an engaging, satisfying life that allows you to realize your full potential and find authentic happiness and wellness.⁹ Importantly, challenge and subsequent accomplishment are necessary features of eudaimonia and distinguish it from hedonia or simple happiness.⁹

This distinction is worth remembering as the veterinary profession works to support its students and graduates in fulfilling careers. A heavy focus on ill-being may perpetuate negative mental health outcomes, and veterinary leaders, educators, and mentors should balance these strategies with ones that leverage resources for a career that is "a richly generative source of satisfaction and fulfillment."⁹ Although veterinary professionals face significant demands and mental health challenges, there are also real opportunities to foster joy and fulfillment.^{1,2,9} Over 90% of veterinarians consider their work enjoyable, and 67% agree that their career is a source of joy. Even when experiencing stress, veterinary students remain positive about their curricular experiences.⁹

Thus, as veterinary scholarship continues to define best practices for student and graduate well-being, contemporary and ancient literature advocates for a balanced approach. This literature review supports the balance and integration of personal and contextual resources for well-being. Future research should consider mixed methods approaches to identify and resolve dissonance between the resources highlighted by either quantitative or qualitative methods. A job demands-resources model will continue to be useful in contextualizing the balance between challenge and accomplishment within the veterinary profession.

Veterinary educators, leaders, and mentors must continue to leverage contextual resources to support personal ones. This literature review has identified 4 strategies for this. These strategies range in scope, from small changes that can be

applied today, to those requiring structural reform. However, no matter the scope, successfully leveraging resources for well-being depends on a genuine cultural commitment to mental health and wellness. This commitment and cultural shift are the pinnacle of contextual and personal resource integration and a nonnegotiable foundation for professional change.

Future work must continue to balance narratives of ill-being and well-being to support veterinary student and graduate mental health. However, a monolithic understanding of well-being will never be enough to provide equitable resources for veterinary students and graduate success. Our understanding of veterinary student and graduate mental health must elevate beyond the positive-psychology approach summarized in this literature review and become truly asset and equity minded. This requires that veterinary scholars and educators disaggregate their understanding of student success and recognize how identity impacts the balance of professional demands and resources. Only then can we critically scaffold resources that support the well-being of all professionals and promote equitable success and equity-minded change within the profession. This is a critical need and the path toward diverse, sustainable manifestations of eudaimonia within the veterinary profession.

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