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1 **EDUCATIONAL RESEARCH REPORT**

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4 **Finding the balance: uncovering resilience in the veterinary literature**

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7 Martin A. Cake\*, Michelle M. McArthur, Susan M. Matthew, Caroline F. Mansfield

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10 \*CORRESPONDING AUTHOR: [mcake@murdoch.edu.au](mailto:mcake@murdoch.edu.au); Ph: +61 8 9360 2175  
11 College of Veterinary Medicine, Murdoch University, South St, Murdoch WA 6150, Australia.  
12 [orcid.org/0000-0002-0072-9024](https://orcid.org/0000-0002-0072-9024)

13  
14 **AUTHOR INFORMATION**

15 **Martin A. Cake**, BSc, BVMS, PhD, is an Associate Professor teaching  
16 anatomy and professional life skills in the College of Veterinary Medicine, Murdoch  
17 University, Murdoch, WA 6050 Australia. E-mail: [mcake@murdoch.edu.au](mailto:mcake@murdoch.edu.au). His current  
18 research interests include the professional (non-technical) veterinary competencies  
19 underpinning employability.

20  
21 **Michelle M. McArthur**, BA(Psych), DCLinPsych is a Senior Lecturer in the School of Animal  
22 and Veterinary Sciences, University of Adelaide, Roseworthy, SA 5371 Australia. E-mail:  
23 [michelle.mcarthur@adelaide.edu.au](mailto:michelle.mcarthur@adelaide.edu.au). Her research interests include communication in  
24 veterinary medicine, human-animal relationships and veterinary professionals' mental  
25 health and wellbeing.

26  
27 **Susan M. Matthew**, BSc(Vet), BVSc, PhD, GradCertEdStud(HigherEd), is Associate Professor  
28 and Associate Chair of Veterinary Medical Education in the College of Veterinary Medicine,  
29 Washington State University, Pullman, WA 99164 USA. E-mail: [smatthew@vetmed.wsu.edu](mailto:smatthew@vetmed.wsu.edu).  
30 Her research interests include the factors influencing veterinary professional practice,  
31 employability and career success.

32  
33 **Caroline F. Mansfield**, BA, Dip Ed, M Ed, PhD, is a Senior Lecturer in the School of Education,  
34 Murdoch University, Murdoch, WA 6050 Australia. E-mail:  
35 [caroline.mansfield@murdoch.edu.au](mailto:caroline.mansfield@murdoch.edu.au). Her research broadly focuses on teachers and  
36 students in learning contexts with particular focus on resilience, motivation, emotion and  
37 efficacy.

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## **ABSTRACT**

Resilience is an issue of emerging importance in veterinary education and research, as in other professional contexts. The aim of this study was to perform an appraisal of how resilience is portrayed in the contemporary (1995-present) research and education literature around veterinary mental health, and attempt a provisional synthesis informing a conception of resilience in the veterinary context. Qualitative analysis of the literature ( $n=59$  included sources) revealed a dominant emphasis on mental health problems, particularly stress, which outweighs and potentially obscures complementary approaches oriented to wellbeing and resilience. We found the construct of resilience under-developed in the veterinary literature and in need of further research, but provide a preliminary synthesis of key themes emerging from the current literature (emotional competence, motivation, personal resources, social support, organisational culture, life balance, and wellbeing strategies). We advocate the need for greater balance between complementary perspectives in veterinary mental health education and research, and propose that an increasing focus on *resilience* (here endorsed as a dynamic and multidimensional process involving personal and contextual resources, strategies, and outcomes) will help to address this balance.

**Key words:** resilience, veterinary mental health, wellbeing, veterinary competencies

## **INTRODUCTION**

During the shift towards competency-based education over the past few decades, various frameworks have defined a wide range of core professional competencies required of the graduate veterinarian. The Royal College of Veterinary Surgeons (RCVS) 'Day One Competences' framework, which has been particularly influential in veterinary education in the UK, Europe, Australasia and elsewhere since its release in 2001,<sup>1</sup> included the somewhat ambiguous statement that the new graduate should "...be aware of the economic and emotional climate in which the veterinary surgeon operates, and respond appropriately to the influence of such pressures". When updated after review in 2014,<sup>2</sup> the revised list provided clearer guidance on this competency, that "...veterinary surgeons need to be resilient and confident in their own professional judgments to withstand the stresses and conflicting demands they may face in the workplace". This clarifies that the person at risk in

74 this climate is the veterinarian themselves, and that their response to these pressures  
75 should enable their *resilience* – allowing them to maintain equilibrium and continue to thrive  
76 despite adversity. Similarly Lewis & Klausner (2003) identified resilience as one of the  
77 nontechnical competencies underlying success as a veterinarian,<sup>3</sup> while the North American  
78 Veterinary Medical Education Consortium (NAVMEC) listed work-life balance, positive coping  
79 skills, and a commitment to personal well-being among the core competencies required of  
80 graduating veterinarians to fulfill societal needs.<sup>4</sup>

81

82 Recognition of the importance of psychological health in competency frameworks comes at  
83 a time when multiple studies have reported mental health problems in veterinarians  
84 including depression,<sup>5</sup> stress,<sup>6</sup> anxiety<sup>7</sup> and suicide.<sup>8</sup> Though these issues are not unique to  
85 the profession,<sup>9</sup> concerns regarding mental health risks are frequently expressed in  
86 educational and professional discourse within the veterinary literature.<sup>e.g. 10-11</sup> These  
87 collective efforts have strengthened an understanding of many of the psychological  
88 challenges as well as poor psychological health experienced by many in the veterinary  
89 profession, including students. Furthermore the attrition rate, at times attributed to the  
90 documented stressful nature of the profession, is noted in the literature.<sup>12,13</sup> This is  
91 important information for educators, practitioners and regulatory bodies alike.

92

93 While we have an increased appreciation of mental health problems in the profession, few  
94 studies articulate the factors associated with psychological wellbeing and growth. More  
95 recent studies have begun preliminary examinations of resilience and associated factors,<sup>14</sup>  
96 while others have explored personal resources associated with performance.<sup>15,16</sup> Cake et al.  
97 (2015) proposed a positive reframing of veterinary practice, highlighting the need to balance  
98 discussions of mental health risk against the potential for fulfilling and self-actualising  
99 experiences through veterinary work.<sup>17</sup> As a profession, we know and discuss little about the  
100 attributes that promote psychological wellbeing and resilience amongst those veterinarians  
101 who are thriving and enjoying their career in veterinary medicine.

102

### 103 **Resilience**

104 From a psychological perspective, resilience is a complex and multifaceted construct  
105 involving the process of positive adaptation in challenging (adverse) circumstances.<sup>18</sup>  
106 Although early resilience research focused on children deemed at risk and understanding the  
107 protective and risk factors that fostered or hindered resilience,<sup>19</sup> research over the past 10

108 years has investigated resilience in a range of ‘caring’ professions such as nursing,<sup>20-22</sup> social  
109 work,<sup>23</sup> and teaching.<sup>e.g. 24-26</sup>

110

111 As the word ‘resilience’ is increasingly being used in everyday language it is important to  
112 clearly define resilience within the scope of particular contexts. Common understandings  
113 about resilience refer to the capacity of individuals to cope with stress and ‘bounce back’  
114 from adversity, yet the body of resilience research indicates that such understandings may  
115 be limited by their simplicity. A useful definition of resilience has been posited by Mansfield  
116 and coauthors (2016),<sup>27</sup> who conceptualise resilience as a capacity, a process, and an  
117 outcome in their research regarding teacher resilience. For the purpose of the present study,  
118 we adopted this definition as the provisional framework for our analysis, i.e. that resilience  
119 involves the *capacity* of an individual to harness personal and contextual resources to  
120 navigate through challenges, the *dynamic process* whereby these resources and contexts  
121 interact over time through use of particular strategies, to enable *outcomes* including  
122 professional engagement, satisfaction and wellbeing.<sup>27</sup>

123

124 Given this provisional definition, the aim of this study was to explore how the concept of  
125 *resilience* is portrayed within contemporary veterinary research, educational discourse and  
126 competency frameworks, and to begin a preliminary synthesis of key emergent themes  
127 around resilience within this literature. Since the concept of resilience was not expected to  
128 be explicit, we also surveyed the prevailing language, outcome measures, findings and  
129 recommendations within the broader literature on veterinary mental health and wellbeing,  
130 to explore factors that might inform both a conception of resilience in the veterinary context  
131 and directions for future work.

132

### 133 **METHODS**

134 A literature search of relevant major databases (Web of Science including CAB Abstracts,  
135 Medline, Current Contents; ERIC; PsycINFO) was performed using the search terms  
136 *veterinary* or *veterinarian* (i.e. *veterinar\** truncation term), and any of the following mental  
137 health problem-oriented or wellbeing-oriented terms collated by the authors: *resilience*,  
138 *thriving*, *coping strategies*, *work/job/personal/life satisfaction*, *wellbeing*, *positive*  
139 *psychology*, *optimism*, *engagement*, *self-care*, *stress management*, *mindfulness*, *mental*  
140 *health*, *stress*, *burnout*, *anxiety*, *suicide*, *suicidal*, *anxiety*, *depression*, or *compassion fatigue*.  
141 Searches including anxiety, stress, and wellbeing/well-being returned a large number of

142 spurious animal-based research papers, so were limited by journal title to exclude clinical  
143 specialist journals unlikely to contain relevant papers. The search was confined to sources  
144 published in the last two decades (1995-present).

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146 The results of the search ( $n=1545$  papers) were imported to reference management  
147 software (EndNote X7.4, Thomson Reuters) and screened by title and/or abstract to exclude  
148 irrelevant papers ( $n=1300$ ). Papers in languages other than English and non-peer reviewed  
149 sources such as letters, news articles, or conference abstracts were excluded ( $n=177$ ). Finally,  
150 papers that could either not be obtained or were not in searchable pdf formats were  
151 excluded ( $n=9$ ), yielding 59 papers for inclusion in the study.

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153 Qualitative analysis software (NVivo 10.2.2, QSR International) was used to code text within  
154 included papers, and to explore the literature using text searches. As found by Beltman et al.  
155 (2011)<sup>26</sup> and Mansfield et al. (2016),<sup>27</sup> the many and varied factors associated with resilience,  
156 and how these are interpreted and understood within the literature posed challenges for  
157 analysis. Consequently, analysis occurred in three phases. Firstly a word frequency count  
158 was performed across all texts to determine raw word frequencies (i.e. including within  
159 references and key words) for mental health terms. Secondly, the subset of papers reporting  
160 empirical research ( $n=38$ ) was manually coded to extract from each paper the outcomes or  
161 variables measured, risk factors and protective factors identified (i.e. major contributors to,  
162 or statistically significant correlates of, negative or positive outcomes), and  
163 recommendations or solutions proposed. Factors thought to be similar were grouped within  
164 common themes, as were undergraduate and workplace factors (for example, 'performance  
165 concerns' included 'worried about not being as smart as other students'<sup>28</sup> and 'making  
166 professional mistakes'<sup>6</sup>). Finally, we explored all papers ( $n=59$ ) by text search for resilience  
167 factors identified in research papers during the previous phase, as well as factors mentioned  
168 in the remaining non-empirical papers. After reviewing search results to ensure the word  
169 appeared in the correct context, the number of papers mentioning each term as a resilience  
170 factor was calculated. In order to better understand these factors, we used the four key  
171 groupings identified in a recent conceptualization of teacher resilience,<sup>27</sup> those being  
172 personal resources, contextual resources, strategies, and outcomes.

173

174 Additionally, 10 competency frameworks identified in a recent systematic review (Cake et al.,  
175 *accepted for publication*) were searched for resilience-related terms. These represent all of

176 the frameworks known to authors meeting the criteria of publication since 2000,  
177 development by an identifiable expert consensus or review process, and either formal  
178 publication in peer-reviewed publication, or adoption by an international accrediting  
179 body.<sup>2,4,29</sup>

180

## 181 **RESULTS**

182 Raw word frequency counts across the included literature showed mental health problem-  
183 oriented terms are used more frequently than resilience or wellbeing-oriented terms, in a  
184 ratio of about 2:1 (Table 1). The terms *stress*, *suicide*, or *depression* accounted for close to  
185 half of all mental health terms used, while words such as *wellbeing* or *resilience* appear far  
186 less frequently. Similarly, *stress* or *stressor* were the most frequent mental health terms  
187 used in source titles (21 titles), followed by *wellbeing* or *wellness* (17 titles), and *suicide* (10  
188 titles).

189

190 An overview of 38 research studies found that mental health problems such as depression,  
191 anxiety, and stress defined the most frequently used outcome measures (Table 2). Only a  
192 minority of studies included validated scales for wellbeing measures, such as the Warwick-  
193 Edinburgh Mental Well-Being Scale (WEBWBS),<sup>6,30,31</sup> which has been validated for use in  
194 veterinarians,<sup>32</sup> or used specific scales to quantify protective factors such as social support or  
195 job satisfaction. Many studies surveyed participants regarding veterinary-specific stressors,  
196 but few used a similar approach to explore protective or satisfying factors associated with  
197 veterinary work. The most consistently identified risk factor was workload, framed as either  
198 academic stress or job demands, interference with work-life balance, or (in particular) long  
199 working hours. Other consistently identified factors included being a recent graduate or  
200 younger veterinarian (10 studies), or female (8 studies). Less than half of the research  
201 studies identified any protective factor, with forms of social support being the most  
202 frequently identified factor. Forms of training (i.e. to raise awareness of risk, or learn  
203 supportive skills), access to counseling, and promotion of support networks or mentoring  
204 were the solutions most frequently proposed. Most of the research studies were cross-  
205 sectional or retrospective in nature; only a few studies described interventions at the  
206 undergraduate<sup>33-35</sup> or early graduate level.<sup>36</sup>

207

208 The words *resilience* or *resilient* were used in 20 included sources. Only a few of these  
209 sources defined the term resilience, including as “...the ability to succeed, live, and develop

210 in a positive way despite stress or adversity” (Coke et al. 2015,<sup>17 p.185</sup>, attrib. Howe et al.  
211 2012<sup>37</sup>), “...the outcome of a dynamic equilibrium between contextual risk and protective  
212 factors” (Coke et al. 2015,<sup>17 p.190</sup>, attrib. Beltman et al. 2011<sup>26</sup>), and “...the ability of an  
213 individual to adjust to adversity, maintain equilibrium, retain some sense of control over  
214 their environment, and continue to move on in a positive manner” (Moffet et al. 2015,<sup>38 p.38</sup>,  
215 attrib. Collard et al. 1996<sup>39</sup>). Mastenbroek and co-workers<sup>15,36,40</sup> cite resilience as a central  
216 element of personal resources, “...people’s sense of being in control and able to influence  
217 their environment successfully...this definition encompasses a feeling of being appreciated  
218 and in control, as well as skills and attitudes that facilitate these feelings.” (attrib. Hobfoll et  
219 al. 2003<sup>41</sup>). Only one research study<sup>14</sup> included a specific, validated measure of resilience,  
220 the Brief Resilience Scale (BRS).

221

222 When the included literature was searched for terms identified as resilience factors (Table 3),  
223 the most frequently mentioned factors were various forms of relational support or  
224 mentoring. Another group of contextual factors were distinct as ‘job resources’, particularly  
225 provision of employee feedback and control, but also aspects of the broader ‘culture’. The  
226 most commonly cited personal resources were emotional competence, and motivation and  
227 purpose; the remainder comprised a group of enabling self-beliefs, attitudes, and behaviours.  
228 The most commonly mentioned strategy was addressing balance, typically expressed as  
229 ‘work-life balance’.

230

231 Only two recently published veterinary competency frameworks explicitly include the word  
232 *resilient* or *resilience*,<sup>2,3</sup> though others contain elements that partly embody resilience (Table  
233 4). The three most consistent themes of resilience across the frameworks were withstanding  
234 or managing stress, work-life balance, and adapting to change or uncertainty. Competencies  
235 mostly comprised desired attitudes and behaviours, and to a lesser extent desired process  
236 (such as making good decisions in the context of ‘self-management’). Two recently  
237 developed competency frameworks do not include resilience-related competencies.<sup>29,42</sup>

238

## 239 **DISCUSSION**

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### 241 **Taking Stock of the Veterinary Mental Health Literature**

242 Our appraisal suggests a potential imbalance in the literature surrounding veterinarian  
243 resilience. While it is not the intention of this study to systematically review the strengths



244 and weaknesses of included sources or the evidence they present (see reviews by e.g.  
245 Bartram and Baldwin 2010,<sup>43</sup> Platt et al. 2012<sup>44</sup>) our overview suggests that the veterinary  
246 research effort (as in the psychological literature more broadly<sup>9</sup>) is methodologically biased  
247 towards identifying the risk factors contributing to mental health problems, with only  
248 shallow exploration of wellbeing or resilience factors. This is perhaps because, as articulated  
249 by Slade (2010), generating a science and shared taxonomy of illness has historically proven  
250 easier than developing the equivalent science of wellbeing.<sup>9</sup> Most studies use scales  
251 designed to measure mental health problems such as depression or anxiety, and focus on  
252 these outcomes in their analysis and discussion. Similarly, multiple studies included bespoke  
253 questionnaires of potential veterinary work-related stressors, but fail to explore aspects of  
254 work with the potential to increase satisfaction, engagement and wellbeing. It is clear that  
255 most research has focused on mental health problems and their sequelae, when it is equally  
256 clear from the literature that these problems affect only a subset of the population in cross-  
257 sectional studies. These research approaches, while undoubtedly valid from a mental health  
258 risk perspective, have potentially left the factors contributing to the health and happiness of  
259 the remainder of the study population under-explored. Explorations of the latter lie within  
260 the domain of positive psychology, a term and concept rarely encountered within the  
261 veterinary literature.

262

263 In a recent example from a large US survey, the conclusion that “veterinarians frequently  
264 experience health-threatening stress related to the demands of practicing veterinary  
265 medicine”,<sup>8, p.954</sup> was reported alongside the finding that 80% of the same sample agreed or  
266 strongly agreed they are happy being a veterinarian. The finding that veterinarians are, on  
267 the whole, more content and enthused about their work than distressed and anxious is  
268 found consistently in the literature,<sup>17,45,46</sup> but remains under-emphasised in surrounding  
269 discourse. Also of note is the conclusion from a recent high-quality systematic review, which  
270 found “...little evidence that veterinary surgeons have particularly poor mental health or  
271 suffer from exceptionally high levels of stress”.<sup>44, p.236</sup> While approaches oriented to either  
272 mental health problems or wellbeing can inform an understanding of veterinary resilience,  
273 what is most notably absent from the literature is a *balance* between these extremes.

274

275 Other deficiencies emerging from appraisal of the veterinary mental health literature include  
276 the dominance of cross-sectional study designs. This is reflected in recent calls for  
277 prospective longitudinal studies to better establish the course of mental health across the

278 undergraduate course and transition to work, and to untangle the causality of correlates  
279 thought to be risk or protective factors.<sup>44,47</sup> A focus on veterinary-specific work stressors and  
280 the emotional load of veterinary work has tended to ignore that the clearest risk factor from  
281 the literature, excessive workload and/or working hours, is a generic occupational hazard  
282 common to many professions and well known in work psychology.<sup>44</sup> The paucity of research  
283 reporting and evaluating the efficacy of potential interventions is also striking, though two  
284 recent reports of small-scale trials have helped to address this balance.<sup>33,36</sup> Identification of  
285 two intractable risk factors clearly established in the literature, being female and being  
286 younger and/or more recently graduated, together with the increasing feminization of the  
287 veterinary workforce, only further emphasizes the importance of investigating and validating  
288 interventions available to strengthen the resilience of veterinary graduates. As noted by  
289 Mellanby (2013),<sup>47</sup> research efforts to date have instead been most helpful at defining and  
290 raising awareness of the problem, reducing the stigma associated with mental health  
291 disorders, and providing a baseline for evaluation of future progress.

292

### 293 **Conceptualising veterinary resilience**

294 Given the generally problem-oriented emphasis of veterinary mental health research and  
295 commentary, which in turn reflects the prevailing emphasis of mental health discourse more  
296 broadly,<sup>9</sup> it is perhaps unsurprising that we found the emerging concept of resilience to be  
297 under-represented and relatively under-developed. It is beyond the scope of this study to  
298 review the evidence for factors contributing to the resilience of veterinarians and veterinary  
299 students, and to do so is perhaps premature given the current scarcity of relevant studies.  
300 Nevertheless, we provide here a scoping overview of possible resilience factors mentioned  
301 in the veterinary literature, and a preliminary synthesis of emerging themes.

302

303 Firstly it is clear that, as has been shown in other contexts,<sup>26,27</sup> resilience comprises an  
304 interactive complex of personal resources, contextual (social/workplace/cultural) resources,  
305 implementable strategies, and resilience outcomes (Table 4). Some elements, such as  
306 autonomy or motivation, may be assigned to multiple categories depending on context.

307 Secondly, several themes emerge across the literature as likely to be important in veterinary  
308 resilience, each briefly discussed below: emotional competence, motivation, personal  
309 resources, social support, organisational culture, life balance, and wellbeing strategies.

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- **Emotional competence** is given particular prominence in veterinary resilience, from multiple perspectives including dealing with the emotional demands of the job, the high level of emotional processing capabilities (i.e. emotional intelligence) required for success, and the use of emotion-focused coping strategies. Many sources emphasize the emotional burden of veterinary work, particularly in the guise of ‘compassion fatigue’,<sup>10,48-51</sup> or the emotional stress resulting from moral challenges.<sup>14</sup> Other challenges include maintaining appropriate emotional distance for provision of empathic, bond-centred care without risking compassion fatigue,<sup>50</sup> and diffusing negative emotions without resorting to maladaptive coping strategies.<sup>52</sup>
  - **Motivation**, including sense of meaning and purpose, stands out as a central resilience factor that is as much an outcome and a strategy, as it is a personal and contextual resource. Cake et al.<sup>17</sup> reviewed sources of satisfaction for veterinarians and found them to be mostly aligned to meaningful purpose and personal growth, thus mediated particularly by the eudaimonic dimensions of *meaning* and *engagement*. For veterinarians, this largely represents the reward side of the effort-reward imbalance model of work-related stress,<sup>53</sup> as well as the concept of ‘compassion satisfaction’, i.e. the protective flip-side of compassion fatigue.<sup>48</sup>
  - Other **personal resources** encompass those defined by Mastenbroek and coauthors as “...developable systems of positive beliefs about one’s self and the world...[that encompass] a feeling of being appreciated and in control as well as skills and attitudes that facilitate these feelings”.<sup>36, p.312</sup> Proactive behavior, assertiveness, self-efficacy, reflective behavior and optimism are shown to be important in their work,<sup>15,36</sup> while autonomy and self-confidence are elements consistently identified elsewhere. A recent trial has importantly shown that these personal resources can be increased through a development program, in which reflection (thus self-awareness) was identified as a necessary element.<sup>36</sup> Self-awareness also aids identification of unhelpful traits or tendencies including perfectionism, which has been identified as a key risk factor for a subset of veterinarians.<sup>5,14</sup>
  - **Social support** from family, friends and personal mentors emerges as a key element of resilience from the veterinary literature. Similarly lack of support, social isolation and homesickness are repeatedly identified as risk factors, suggesting the ability to establish support structures in new environments is important. Some authors claim that social relationships affect happiness more than any other factor.<sup>54</sup>

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- **Organisational culture** encompasses support from supervisors, colleagues and professional mentors, but also those factors described as job resources in the Job Demands-Resources model of work-related wellbeing,<sup>15</sup> including decision latitude (professional autonomy) and opportunity for professional development. Access to professional help, and a non-judgmental culture of help-seeking are also important. Organizational factors may be influenced directly by management decisions, but also by the broader culture of normative beliefs and behaviours among peers,<sup>55</sup> and more broadly across the profession. These mutual interactions in an expanding web of social and workplace support comprise what is termed the ecological model of resilience.<sup>56,57</sup> Bartram and co-authors discuss workplace strategies for encouraging employees to thrive.<sup>53,58</sup>
  - **Life balance** is more often expressed in the veterinary literature as ‘work-life balance’, though we prefer the former term since, “...rather than the difficulties of work needing to be balanced by the positivity of ‘other life’, work can and should be an enjoyable and rewarding part of living”.<sup>59, p.28</sup> Excessive workload, work hours and work-home interference emerge strongly as risk factors in the literature,<sup>5,14,15,60</sup> highlighting the need for restorative balance as a prominent theme in veterinary resilience. Enabling strategies mentioned in the literature include time management, prioritization of tasks, and boundary setting. This factor interacts with social support, *i.e.* the need to make time to maintain nourishing relationships.
  - **Wellbeing strategies** comprise a potential ‘toolkit’ of active strategies to find solutions to problems, to disengage unhelpful thoughts and emotions, and to proactively build a buffering sense of wellbeing. Programs should include integrated and holistic attention to wellness across physical, emotional and psychological health. While present in the literature, the idea of requiring wellness for efficacy as a practitioner – that “...one needs to care for oneself to care for others”<sup>48</sup> - has perhaps not been as strongly advocated in veterinary literature and practice as it is in medicine and other health professions.<sup>11,48</sup>

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374 When reviewing the above resilience themes within published veterinary competency  
375 frameworks, it is clear that current frameworks both individually and collectively fail to  
376 address the full range of capabilities, attitudes and personal and contextual resources  
377 potentially promoting resilience. Life balance is the most consistent and most emphasized  
378 competency within existing frameworks, while emotional competence, personal resources

379 and wellbeing strategies are mainly implied in the context of ‘stress management’ or ‘coping  
380 skills’. Competencies in engaging support or help-seeking (i.e. engaging contextual  
381 resources) are under-represented, while those related to motivation and influencing  
382 organizational culture are absent. Conversely, a repeated theme in competency frameworks  
383 of adaptability or flexibility in the face of change, is in some cases ambiguously aligned to  
384 resilience, and is instead contextually linked to responses to altered economic or  
385 technological circumstances.<sup>4,61</sup>

386

### 387 **CONCLUSION**

388 The recently released RCVS Vet Futures report, while affirming wellbeing as a priority for the  
389 profession, cautioned against the “...danger of the profession allowing itself to become over-  
390 identified with the single issue of stress”.<sup>59, p.27</sup> A simple word frequency count starkly  
391 confirms this phenomenon within the recent literature around veterinary mental health,  
392 with the word *stress* far eclipsing all other mental health terms, followed by serious  
393 problems such as suicidality and depression. Similarly, appraisal of the research effort  
394 reveals it to be mostly oriented towards measurement of mental health problems  
395 (depression, anxiety, distress) and associated risk factors, and notably less focused on  
396 identifying wellbeing factors or evaluating potential solutions. This imbalance persists across  
397 both research and commentary articles, in both undergraduate and postgraduate contexts,  
398 arguably conveying an almost ‘war zone’-like outlook in some discourse – and quite literally  
399 so, in one recent example comparing veterinarians to troops being deployed in Iraq.<sup>62</sup> But  
400 while a palpable sense of psychological morbidity and risk is clearly repeated across the  
401 veterinary literature, we found the concepts of psychological wellbeing and resilience to be  
402 less prominent and well-developed.

403

404 Our intention in this appraisal is not to diminish the value of understanding the prevalence  
405 or risk factors of mental health problems and suicidality in the veterinary profession. We do  
406 suggest however, that this emphasis has the potential to obscure a full understanding of  
407 veterinary resilience and wellbeing, since these are shown to be more than the absence of  
408 negative outcomes. Rather, we find resilience in the veterinary context to be a broad and  
409 multi-dimensional complex of interacting factors, that is not adequately captured by  
410 competency frameworks or prevailing research approaches. While we also note the  
411 limitations of the current literature to support firm conclusions, we provide a preliminary  
412 synthesis of emerging themes around resilience in the veterinary context.

413

414 In drawing together this conception of resilience, we provisionally endorse the definition  
415 developed in other professional contexts<sup>21,27</sup> of resilience as both a capacity, a process and  
416 an outcome, as compatible with the current understanding of veterinary resilience and a  
417 useful basis for further exploration. We agree that resilience is a dynamic and multifaceted  
418 *process* in which individuals draw on personal and contextual resources, and utilise specific  
419 strategies in order to navigate challenges and work towards adaptive outcomes.<sup>27</sup>  
420 Development of personal resources (such as motivation, emotional competence, enabling  
421 self-beliefs) and a toolkit of active strategies (such as problem-solving, help-seeking,  
422 mindfulness) can help build capacity for resilience in professional life. Capacity to engage  
423 and mobilise contextual resources (such as social, collegial and professional support) is also  
424 important, and may be enabled by the organizational culture. Professional outcomes of  
425 resilience in the veterinary profession may be evident in sustained engagement, satisfaction  
426 and meaningful fulfillment, as well as wellbeing. However, given the current paucity of  
427 appropriate studies in the veterinary literature this provisional conception should be  
428 reappraised in the light of future research and scholarship.

429

430 In summary, just as we might advocate life balance to our students, we advocate greater  
431 balance in research and education in veterinary mental health, and the need to complement  
432 approaches oriented to mental health problems, with those oriented to wellbeing and  
433 resilience. This is important since the factors contributing to psychological distress and ill  
434 health, and the factors contributing to wellbeing and resilience, are not opposite ends of a  
435 unidimensional continuum but are complex complementary phenomena each demanding  
436 exploration. We propose that greater educational and research focus on the dynamic,  
437 multidimensional construct of *resilience* may help to develop this balance.

438

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446

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606

607

608 **Table 1:** Raw word frequency count for mental health terms, across all included papers  
609 ( $n=59$ ). Wellbeing or resilience-oriented terms are shown in bold italics.

610

<b>Term</b>	<b>Count</b>
Stress, stressful	2273
Suicide, suicidal	1522
Depression, depressive	1027
<b><i>Support</i></b>	<b><i>678</i></b>
Stressor, stressors	650
Burnout	634
<b><i>Resources</i></b>	<b><i>621</i></b>
Anxiety	609
<b><i>Satisfaction</i></b>	<b><i>499</i></b>
<b><i>Coping</i></b>	<b><i>341</i></b>
<b><i>Positive</i></b>	<b><i>335</i></b>
<b><i>Help</i></b>	<b><i>312</i></b>
Distress	299
<b><i>Engagement</i></b>	<b><i>297</i></b>
<b><i>Wellbeing</i></b>	<b><i>253</i></b>
Death, deaths	213
Exhaustion	176
Fatigue	152
<b><i>Success, successful</i></b>	<b><i>139</i></b>
<b><i>Resilience</i></b>	<b><i>95</i></b>
<b><i>Optimism</i></b>	<b><i>92</i></b>
Cynicism	77
<b><i>Proactive</i></b>	<b><i>70</i></b>
<b><i>Motivation</i></b>	<b><i>62</i></b>
<b><i>Wellness</i></b>	<b><i>60</i></b>
<b><i>Healthy</i></b>	<b><i>55</i></b>
<b><i>Happiness</i></b>	<b><i>45</i></b>

611

**Table 2.** Overview of recent mental health studies of veterinarians and veterinary students (number of studies in parentheses)

<b>Outcomes measured (30)</b>	<b>Risk factors identified (25)</b>	<b>Protective factors identified (17)</b>	<b>Solutions proposed (26)</b>
Depression (14)	Workload (21)	Peer support (9)	Training (22)
Specific stressors (12)	Recent/younger graduate (10)	Job satisfaction (4)	Counselling (13)
Anxiety (10)	Female gender (8)	Workshop intervention (4)	Support networks (11)
Stress (8)	Lack of work-life balance (8)	Optimism (2)	Mentoring (8)
Job satisfaction (5)	Performance concerns (6)	Self-esteem (2)	Help-seeking culture (7)
Job stress/demands (5)	Financial concerns (5)	Self-efficacy (2)	Autonomy (6)
Social support (5)	Isolation, homesickness (5)	Relationships (1)	Problem-solving (5)
Burnout (4)	Uncertainty, lack of control (5)	Motivation (1)	Reduced workload (5)
Mental health (4)	Lack of support (5)	Autonomy (1)	Exercise (4)
Suicide attempt (4)	Moral challenges (3)	Exercise (1)	Admissions selection (3)
Suicide ideation (3)	Team conflict (3)	Hobbies (1)	Empathy, recognition (2)
Work characteristics (3)	Perfectionism (3)		Mindfulness (2)
Attitudes to mental health (3)	Mental health stigma (2)		Work-life balance (2)
Job resources (3)	Physical health (2)		
Personal resources (3)	Relationship issues (1)		
Work engagement (3)			
Work-home interaction (3)			
Workload (2)			
Well-being (2)			
Positive/negative affect (2)			
Optimism (2)			
Life satisfaction (2)			
Perfectionism (1)			
Resilience (1)			
Team effectiveness (1)			

**Table 3.** Overview of resilience factors mentioned in the veterinary mental health literature (number of papers in parentheses)

<b>Personal resources (53)</b>	<b>Contextual resources (55)</b>	<b>Strategies (50)</b>	<b>Outcomes (51)</b>
Emotional competence (27)	Relationships (43)	Life balance (30)	Wellbeing (45)
Motivation (19)	Colleagues (32)	Professional development (18)	Job satisfaction (23)
Sense of meaning, purpose (13)	Family support (28)	Counselling, therapy (16)	Enjoyment (17)
Autonomy (11)	Social support (26)	Time management (15)	Self-esteem (14)
Optimism (11)	Mentors (19)	Problem-solving (12)	Engagement (12)
Confidence (10)	Feedback (15)	Exercise (12)	Fulfillment (10)
Flexibility, adaptability (9)	Support networks (14)	Meditation (12)	Life satisfaction (7)
Assertiveness (8)	Peer support (12)	Reflective practice (12)	Happiness (3)
Proactivity (8)	Decision latitude (12)	Coaching (8)	Thriving (3)
Self-awareness (6)	Culture (11)	Sleep (8)	Flourishing (2)
Self-efficacy (6)	Skills discretion (10)	Diet, nutrition (7)	'Compassion satisfaction' (2)
Perspective (6)		Mindfulness (7)	Eudaimonia (1)
Initiative (5)		Hobbies, volunteering (7)	
Persistence (4)		Spirituality, religion (6)	
Hope (3)		Help-seeking (6)	
Positive attitude (2)		Gratitude (4)	
Self-compassion (1)		Prioritization, organisation (4)	
		Humour (4)	
		Positive psychology (3)	
		Setting boundaries (2)	
		Goal-setting (2)	

**Table 4.** Resilience-related competencies included in published veterinary competency frameworks 2001-2014.

Framework	Competency
<p>Royal College of Veterinary Surgeons (RCVS) 2001, 2014 (UK)<sup>1,2</sup>  <i>Essential competences required of the new veterinary graduate “Day One Skills”</i>                      Walsh et al. 2001 (US)<sup>61</sup>  <i>Attributes expected of graduates of a veterinary program [University of California]</i></p>	<p>Understand the economic and emotional context in which the veterinary surgeon operates.  <i>Veterinary surgeons need to be resilient and confident in their own professional judgments to withstand the stresses and conflicting demands they may face in the workplace. They should know how to recognise the signs of stress and how to seek support to mitigate the psychological stress on themselves and others.</i>                      A tolerance for conflicting ideas and an openness and flexibility to accept change.</p>
<p>Lloyd &amp; Walsh 2002 (US)<sup>63</sup>  <i>Template for a Recommended Curriculum in “Veterinary Professional Development and Career Success”</i></p>	<p>II. Basic Life Skills for the Successful Veterinarian  <i>B. Emotional intelligence:</i> 5. developing and maintaining self-esteem (individual definition of success); 6. stress and time management  <i>G. Achieving a balance between one’s career, financial success, and personal life:</i> 1. establishing life balance goals; 2. family needs and values; 3. handling conflicts between personal, family, and business goals</p>
<p>Collins &amp; Taylor 2002 (Australia/NZ)<sup>64</sup>  <i>Attributes of Australasian veterinary graduates</i></p>	<p><i>Capacity for Self-Management and Self-Knowledge:</i> including ... change skills; ... work/leisure balance</p>
<p>Lewis &amp; Klausner 2003 (US)<sup>3</sup>  <i>Non-technical competencies underlying career success as a veterinarian</i></p>	<p><i>Drives for results:</i> Persists despite obstacles and challenges; Handles multiple demands and competing priorities.  <i>Pursues development:</i> Broadens oneself by pursuing interests outside the profession.  <i>Demonstrates adaptability and resilience:</i> Responds to competing demands or abrupt changes with a positive outlook; Stays optimistic and resilient in the face of adversity, change, and ambiguity; Uses a large repertoire of skills, experiences, and behaviors to handle a wide variety of challenges and opportunities.</p>
<p>Miller et al. 2004 (US)<sup>65</sup>  <i>Practitioner-defined competencies required of new veterinary graduates in food animal</i></p>	<p><i>People skills:</i> 109. Identify positive stress management techniques; 121. Discuss the necessity of a family/work balance; a. Demonstrate an understanding of the potential conflicts between family and practice.</p>

*practice*

North American Veterinary Medical Education Consortium (NAVMEC) 2011 (US)<sup>4</sup>

*Core competencies of all graduating veterinarians*

Vandeweerd et al. 2014 (Belgium/France)<sup>66</sup>  
*Competency framework based on families of professional situations*

*Ethics and Professionalism*: 141. Define professionalism; iii. Positive attitude.

*Management (self, team, system)*: Veterinarians make effective choices to manage their professional and personal lives. They are aware of the challenges and the importance of making good work/life balance decisions; The ability to identify business and personal priorities and apply time management skills to balance professional and personal life.

*Leadership*: They are guided by ... a commitment to ... personal well-being... .

*Adapt to Changing Environments*: Veterinarians function within a continually changing physical, technological, economic, and societal environment. They demonstrate curiosity and flexibility when challenged with changing priorities and situations; Knowledge of coping skills to handle stress in positive ways.

*Basic surgery*: Attitudes - objective, convincing if necessary, and reassuring; calm in unexpected situations.

*Medical and surgical emergencies*: Veterinarians react quickly, manage stress caused by the modification of their usual routine, and establish the first actions.; General skills - manage calendar (timetable) changes, logistics, and related stress; Attitudes - calm and convincing.

*Hospitalization*: General skills - manage stress and fatigue

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