



## Workplace stress, mental health, and burnout of veterinarians in Australia

PH Hatch,<sup>a\*</sup> HR Winefield,<sup>b</sup> BA Christie<sup>c</sup> and JJ Lievaart<sup>c,d</sup>

**Objective** To determine the frequency of the states of depression, anxiety, stress and burnout using internationally validated methods and to relate these to the demographic characteristics of veterinarians in Australia.

**Methods** A postal survey of registered veterinarians with at least one year's experience and whose address was available; 1947 returned the questionnaire providing data for analysis.

**Results** Overall, veterinarians describe higher levels of depression, anxiety, stress and burnout than the general population. The severity of these states was determined by gender, background, type of practice and years after graduation.

**Conclusions** Modifying the curricula of veterinary schools to include the teaching of personal cognitive and coping skills to undergraduate veterinary students, the provision of the opportunity to enhance these skills throughout their veterinary career and changes in the veterinary workplace could result in improved mental health, increased job engagement and work satisfaction.

**Keywords** anxiety; burnout; depression; stress; veterinarians

**Abbreviations** CBI, Copenhagen Burnout Inventory; CI, confidence interval; DASS, Depression, Anxiety and Stress Scales; OR, odds ratio

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Few formal studies of veterinarians' occupational stress, mental health and burnout or its antithesis, job engagement, have been reported. A self-diagnosis burnout scale reported that 67% of female veterinarians in the US showed clear signs of burnout and a previous study demonstrated that 53% of male veterinarians were also in this category.<sup>1</sup> A survey of Finnish veterinarians that focused on occupational stress and burnout found 40% suffer mild burnout, being higher in the >45-year-old age group and 73% were rather or very stressed.<sup>2</sup> A Belgian study of bovine practitioners reported that 15% suffered high levels of emotional exhaustion,<sup>3</sup> a key component of burnout.<sup>4,5</sup>

Anecdotally, Australian veterinarians are also stressed and burned out, but no empirical studies using validated questionnaires have been

reported. A random survey in which 313 veterinarians responded (39% response rate) found levels of stress varied with individuals, but the overall stress level was moderate and it was concluded that 'work-related stress could not be described as a problem endemic to Australian veterinarians on the basis of that survey' (HL Davis and S Williams, pers. comm. 2002). The Kessler K10, a measure of psychological distress, demonstrated that veterinarians were twice as distressed as the general population in a study of workplace injuries and suicide (H Fairnie, pers. comm. 2006). A survey of small animal veterinarians concluded that this subset was prone to job stress.<sup>6</sup> A survey of veterinarians who graduated from Australian veterinary schools between 1960 and 2000<sup>7</sup> reported one-third as having poor psychological health and job-related anxiety, but depression was not high, although some did report distress. No relationship was found between type of practice and mental health. The General Health Questionnaire 12 was used as the measure of psychological distress, but it measures transient affect not chronicity and lacks discriminatory power in detecting cases and non-cases in the depression-anxiety spectrum.<sup>8</sup> A longitudinal study of University of Queensland graduates postulated that new graduates are 'suffused with idealistic enthusiasm', but suffer a gradual loss of idealism, energy and commitment over time, shortening their careers as veterinarians.<sup>9</sup> The progression through disillusionment, fatigue, frustration and mental anguish to feelings of incompetence, helplessness and hopelessness is reported to be embraced by the concept of burnout.

The core element of burnout is fatigue and exhaustion resulting from the interaction of the individual and workplace stress.<sup>5</sup> Each individual experiences burnout in a unique way, often describing emotions of frustration, lack of enthusiasm, being overwhelmed, overloaded, overworked and trapped. The basic themes are an erosion of emotions and a problem of fit between the person and the job. Six mismatches have been identified as affecting well-being: work overload, lack of control, insufficient reward (both intrinsic and extrinsic), breakdown in community, absence of fairness and conflicting values in the workplace.<sup>10</sup>

Comparing the scale for personal burnout with that of work-related burnout can identify individuals who attribute their fatigue to non-work factors (health or family demands); likewise, client-related burnout examines the connection to 'people work'.<sup>5</sup>

With the exception of the study of burnout in Belgian veterinarians,<sup>3</sup> valid comparisons cannot be made with any other international study. The detrimental effect of workplace burnout is not restricted to the individual but also affects the workplace. For the individual, as negativity increases, productivity decreases, increasing the work load of others and thus precipitating their burnout. A noteworthy outcome for the business is not only decreased productivity but decreased

\*Corresponding author.

<sup>a</sup>Hatch Counselling and Consultancies, PO Box 1450, Wodonga, Victoria 3689, Australia; [yourvisionyourlife@koee.com.au](mailto:yourvisionyourlife@koee.com.au)

<sup>b</sup>Faculty of Health Sciences, University of Adelaide, Adelaide, South Australia, Australia

<sup>c</sup>School of Animal & Veterinary Science, Charles Sturt University, Wagga Wagga, New South Wales, Australia

<sup>d</sup>E.H. Graham Centre for Agricultural Innovation (an alliance between Charles Sturt University and NSW Department of Industry and Development), Wagga Wagga, New South Wales, Australia

profitability. Prevention of burnout requires the identification of the stressors involved and managerial changes to decrease the effects of those stressors.

### Measures of psychological health and burnout

The Kessler K10 was developed to screen for non-specific psychological distress (mental disorders) using the modern psychometric item response theory and was constructed to have consistent severity ratings across demographic sub-samples, being sensitive in the 90–99th percentile range to discriminate between community cases and non-cases, as previously defined.<sup>11</sup> It is used as a broad-gauge screening tool for mental disorders.<sup>12</sup> The 1997 Australian Survey of Mental Health and Wellbeing demonstrated that the Kessler K10 outperformed the General Health Questionnaire 12 as a measure of non-specific mental health and was selected for inclusion in the 2001 population health survey.<sup>11</sup> Analysis of the 2001 database found gender and educational bias effects to be small, adding further to the validity of the Kessler K10 in epidemiological studies of mental health.<sup>13</sup>

The Depression, Anxiety and Stress Scales (DASS) were initially developed to define and measure the core features of the constructs of depression and anxiety, but a third construct emerged and that was stress. The DASS is unique because it was developed using normal Australian subjects prior to being trialled in the clinical situation. The major difference between non-clinical and clinical subjects was one of severity.<sup>14</sup> Depression is characterised by loss of self-worth and is broader than just sadness of mood because it is associated with a perception that important life goals will not be attained. The anxiety scale emphasises the enduring state of anxiety and the acute response to fear, the latter also being included in some other self-report scales. The scales give weight to somatic and subjective symptoms and situational anxiety. The stress scale measures a state of persistent arousal with a low threshold for becoming upset or frustrated, but further research is needed to clarify the external validity of the scale in relation to life events, appraisal and coping, and its separation from anxiety. There is a positive correlation between depression and anxiety, which may indicate a common cause of anxiety and depression and stress (i.e. an individual vulnerability factor and a common environmental activation factor).<sup>14</sup> The 21-item short-form DASS 21 was used in this study.

The first study of burnout in Danish workers (PUMA study: Project on Burnout, Motivation and Job Satisfaction)<sup>5</sup> found that the de facto gold standard for measuring burnout, the Maslach Burnout Inventory, was unsatisfactory, leading to the development and validation of new tool, the Copenhagen Burnout Inventory (CBI).<sup>5</sup>

The CBI focuses on exhaustion in three life domains: personal burnout, work-related burnout and client-related burnout. Personal burnout is defined as 'the degree of physical and psychological fatigue and exhaustion experienced by a person'; work-related burnout as 'the degree of physical and psychological fatigue and exhaustion experienced by a person as related to his/her work'; and client-related burnout as 'the degree of physical and psychological fatigue and exhaustion experienced by a person as related to his/her work with clients'.<sup>5</sup>

The aims of the present study were twofold, with the first being to determine the frequency of depression, anxiety and stress states and

burnout in Australian veterinarians using validated measures. The second was to determine the relationship of the factors of gender, school of graduation, life experience before entering university, current role and type of veterinary work now performed (for practitioners), as well as the role as principal (partner) or associate (assistant), to the psychological states. We report our results of a survey of Australian veterinarians using two measures of psychological health, namely the Kessler K10 and the DASS, and one of burnout, the CBI, and their relationship to the demographic data.

### Materials and methods

The 2006 veterinary rolls were used to create a database of names and addresses of veterinarians who graduated before 2005, with the exception of the Northern Territory (2004 roll) and Tasmania (Yellow Pages telephone directory). Veterinarians whose address was not included were deleted, as were those with an overseas address. Veterinarians with registrations in two or more jurisdictions were identified and the address coinciding with the State roll was retained. Basic demographic data are not collated throughout Australia, with the exception of the New South Wales Veterinary Practitioners Board.

Reference baseline data are from the 2001 ABS Health Survey of the Australian population.<sup>15</sup> The scores were divided into four rankings: low (10–15), moderate (16–21), high (22–29) and very high (30–50).

The data from the questionnaires were entered into an Excel (Microsoft Office 2007) spreadsheet prior to being transferred to PASW18 (SPSS Inc., Chicago, IL, USA) for descriptive analysis and significance testing ( $\chi^2$  test) between the different categories of gender, background, years after graduation, type of practice/work and professional relationship related to non-specific psychological distress (Kessler K10), depression, anxiety and stress (DASS) and burnout (CBI). A multivariate logistic regression model was used to determine the factors affecting the extreme categories in the DASS (severe and extremely severe categories), the Kessler K10 (high and very high categories) and burnout scores >50. To select the best model, a backward selection (Wald selection criteria) was used and factors were excluded at a P-value of 0.10.

The survey was voluntary and anonymous. Ethics approval was received from the University of Adelaide Human Research Ethics Subcommittee.

### Results

Of the 6991 survey questionnaires posted, a total of 2018 were returned, of which 2004 were completed. Retired and non-practicing veterinarians were excluded, as well as the four replies received after the data had been compiled, leaving 1947 with useable data. Of these, 1000 (51.4%) respondents were male and 947 (48.6%) were female. All veterinary schools were represented, with 566 (29.1%) of the respondents from The University of Queensland, 562 (28.9%) from The University of Sydney, 377 (19.4%) from The University of Melbourne, 287 (14.7%) from Murdoch University and the remaining 155 (8.0%) respondents having graduated from overseas universities. Most (1008) veterinarians had a capital city background, 575 were from rural cities/towns and 364 had a rural or agricultural background; 1020 were in

**Table 1. Distribution of Kessler K10 scores among veterinarians**

	Kessler K10 category				Total	Significant difference <sup>#</sup>
	Low	Moderate	High	Very high		
Reference baseline data*	64.3%	23.0%	9.0%	3.6%		
All respondents	711 (36.6%)	848 (43.6%)	283 (14.6%)	102 (5.2%)	1944	
Gender						
Male <sup>A#</sup>	450 (45.1%)	400 (40.1%)	100 (10.0%)	47 (4.7%)	997	B
Female <sup>B</sup>	261 (27.6%)	448 (47.3)	183 (19.3%)	55 (5.8%)	947	A
Background						
Capital city <sup>C</sup>	350 (34.8%)	444 (44.2%)	155 (15.4%)	56 (5.6%)	1005	E
Rural city/town <sup>D</sup>	195 (34.0%)	265 (46.2%)	76 (13.2%)	38 (6.6%)	574	E
Farm <sup>E</sup>	166 (45.5%)	139 (38.1%)	52 (14.2%)	8 (2.2%)	365	C, D
Years after graduation						
<5 <sup>F</sup>	55 (20.7%)	127 (47.7%)	64 (24.1%)	20 (7.5%)	266	H, I, J
5–10 <sup>G</sup>	72 (25.6%)	137 (48.8%)	54 (19.2%)	18 (6.4%)	281	H, I, J
11–15 <sup>H</sup>	121 (37.6%)	138 (42.9%)	47 (14.6%)	16 (5.0%)	322	F, G, I, J
16–20 <sup>I</sup>	87 (28.2%)	177 (57.3%)	35 (11.3%)	10 (3.2%)	309	F, G, I, J
>20 <sup>J</sup>	376 (45.5%)	329 (39.8%)	83 (10.0%)	38 (4.6%)	826	F, G, I, J
Type of practice/work						
Companion animal <sup>K</sup>	354 (34.8%)	449 (44.1%)	158 (15.5%)	57 (5.6%)	1018	L, N
Large animal <sup>L</sup>	19 (61.3%)	10 (32.3%)	2 (6.4%)	0 (0.0%)	31	K, M
Mixed <sup>M</sup>	142 (33.9%)	188 (44.9%)	68 (16.2%)	21 (5.0%)	419	L, P
Consultancy/specialist <sup>N</sup>	65 (51.2%)	46 (37.1%)	10 (8.1%)	3 (2.4%)	124	K, P
Equine <sup>O</sup>	34 (40.0%)	34 (40.0%)	10 (11.8%)	7 (8.2%)	85	
Salaried <sup>P</sup>	97 (36.7%)	121 (45.8%)	32 (12.1%)	14 (5.3%)	264	M, N
Professional relationship						
Principal <sup>Q</sup>	392 (52.5%)	241 (32.2%)	87 (11.6%)	27 (3.6%)	747	R
Associate <sup>R</sup>	314 (35.8%)	336 (38.4%)	166 (18.9%)	60 (6.8%)	876	Q

\*2001 Australian Bureau of Statistics health survey of the Australian population.<sup>15</sup>

<sup>#</sup>Significant differences between categories of each variable (gender, background, years after graduation, type of practice/work, and professional relationship) are indicated in the last column ( $P < 0.05$ ,  $\chi^2$  test). Categories are identified by letter in the first column.

companion animal practice, 31 in large animal practice, 420 in mixed animal practice, 127 in consultancy/specialist practice, 85 in equine practice and 264 in salaried positions (which included research, teaching, industry and government administrative positions). Of the veterinary practitioners, 834 were assistant/associate veterinarians and 794 were practice principals or partners.

### Psychological distress

**Kessler K10 scores.** Veterinarians' scores were found to be more in the moderate, high and very high levels of psychological distress, and female veterinarians tended to score higher than their male cohorts. Those with a farm or rural enterprise background were underrepresented in the very high category compared with those from a capital city or a rural town or city. Scores in the high and very high categories decreased with increasing years from graduation, but increased in the very high category after 20 years. Consultancy/specialist and large animal practitioner scores approached the baseline reference scores, but very high scores occurred more

frequently in companion animal, mixed animal practitioners and salaried veterinarians. For practitioners, practice principal/partner scores were in the moderate category, while associate/assistant veterinarian scores were higher in the moderate, high and very high categories (Table 1).

**DASS depression scores.** Overall, the depression scores of veterinarians were higher in the moderate, severe and extremely severe categories compared with the reference baseline data (Table 2). Female veterinarians were more depressed than their male counterparts; however, both sexes were in the extremely severe category by a factor of two. Likewise, those from a capital city or a rural city/town had significantly higher scores in the moderate, severe and extremely severe categories. The first 5 years after graduation had higher scores in the categories mild–extremely severe, compared with other groups. With the exception of large animal practitioners, all groups were more depressed than the reference baseline data, the most depressed being salaried and equine veterinarians.

**Table 2.** Distribution of DASS depression scores among veterinarians

	DASS depression category					Total	Significant difference <sup>#</sup>
	Normal	Mild	Moderate	Severe	Extremely severe		
Reference baseline data*	78%	9.0%	8.0%	3.0%	2.0%		
All respondents	1446 (74.5%)	154 (7.9%)	194 (10%)	73 (3.8%)	75 (3.9%)	1942	
Gender							
Male <sup>A#</sup>	775 (77.7%)	60 (6.0%)	89 (8.9%)	37 (3.7%)	37 (3.7%)	998	B
Female <sup>B</sup>	671 (71.0%)	94 (9.9%)	105 (11.1%)	37 (3.9%)	38 (4.0%)	945	A
Years after graduation							
<5 <sup>C</sup>	177 (66.3%)	35 (13.1%)	28 (10.5%)	15 (5.6%)	12 (4.5%)	267	E, G
5–10 <sup>D</sup>	196 (69.5%)	26 (9.2%)	41 (14.5%)	8 (2.8%)	11 (3.9%)	282	
11–15 <sup>E</sup>	249 (78.3%)	17 (5.3%)	29 (9.1%)	12 (3.8%)	11 (3.5%)	318	C
16–20 <sup>F</sup>	192 (77.1%)	20 (8.0%)	20 (8.0%)	11 (4.4%)	6 (2.4%)	249	
>20 <sup>G</sup>	632 (76.6%)	56 (6.8%)	76 (9.2%)	27 (3.3%)	33 (4.0%)	824	C
Type of practice/work							
Companion animal <sup>H</sup>	741 (72.7%)	89 (8.7%)	114 (11.2%)	35 (3.4%)	40 (3.9%)	1019	K
Large animal <sup>I</sup>	27 (87.0%)	1 (3.2%)	1 (3.2%)	2 (6.6%)	0 (0.0%)	31	
Mixed <sup>J</sup>	319 (76.1%)	31 (7.4%)	40 (9.5%)	15 (3.6%)	14 (3.3%)	419	K
Consultancy/specialist <sup>K</sup>	109 (85.8%)	1 (0.8%)	8 (6.3%)	4 (3.1%)	5 (3.9%)	127	H, J, L, M
Equine <sup>L</sup>	61 (71.8%)	7 (8.2%)	7 (8.2%)	6 (7.1%)	4 (4.7%)	85	K
Salaried <sup>M</sup>	190 (72.5%)	25 (9.5%)	24 (9.2%)	11 (4.2%)	12 (4.6%)	262	K
Professional relationship							
Principal <sup>N</sup>	617 (78.0%)	52 (6.6%)	78 (9.9%)	25 (3.2%)	19 (2.4%)	791	O
Associate <sup>O</sup>	588 (70.5%)	75 (9.0%)	93 (11.2%)	37 (4.4%)	41 (4.9%)	834	N

\*Lovibond and Lovibond.<sup>14</sup>

<sup>#</sup>Significant differences between categories of each variable (gender, background, years after graduation, type of practice/work, and professional relationship) are indicated in the last column ( $P < 0.05$ ,  $\chi^2$  test). Categories are identified by letter in the first column.

DASS, Depression, Anxiety and Stress Scales.

**DASS anxiety scores.** The percentage of veterinarians classified as anxious was less than the reference baseline data; however, females tended to be slightly more anxious than male cohorts. Graduates with a capital city or rural town/city background were overrepresented in the extremely severe category. There were two periods, <5 years and 11–15 years after graduation, when anxiety was highest, in the extremely severe classification. The number of associate/assistant veterinarians was also increased in the extremely severe classification (Table 3).

**DASS stress scores.** Stress scores for veterinarians generally exceeded reference baseline values. Variation only occurred in the extremely severe category. More female veterinarians were classified in the extremely severe group than their male counterparts. For veterinarians with a farm or agricultural enterprise background, stress levels reflected more closely the reference baseline data than those with a capital city or rural town/city background. The numbers in each stress category decreased with increasing years from graduation, approaching the baseline data after 15 years. Associate veterinarians were more stressed than practice principals and partners (Table 4).

#### Burnout

Overall, the percentage classified as suffering burnout exceeded the reference percentages in all three domains, with the one exception

being large animal practitioners. The percentage of female veterinarians classified as suffering burnout was twice the reference percentage in all domains. Burnout was more pronounced in veterinarians with a capital city or rural city/town background, compared with a farm background. Significant differences occurred in the type of practice or work, with all exceeding reference percentages, except for large animal practitioners (Table 5).

#### Logistic regression

Veterinarians from capital cities (odds ratio (OR) 2.6, 95% confidence interval (CI) 1.1–6.1) and rural cities/towns (OR 3.1, 95% CI 1.3–7.5) were significantly more likely to be in the highest categories of depression scores (measured by the DASS depression scale) compared with those from a rural or agricultural enterprise background (reference category). Veterinarians within 10 years of graduation were more likely to be in the highest categories of stress scores with an OR of 2.7 (95% CI 1.4–5.2) for >5 years and an OR of 2.1 (95% CI 1.0–4.4) between 5 and 10 years post-graduation, compared with the reference category of veterinarians <20 years after graduation (Table 6).

Females (OR 1.6, 95% CI 1.2–2.0) and veterinarians within 10 years of graduation were both associated with the high and very high Kessler

**Table 3. Distribution of DASS anxiety scores among veterinarians**

	DASS anxiety category					Total	Significant difference <sup>#</sup>
	Normal	Mild	Moderate	Severe	Extremely severe		
Reference baseline data*	78%	9.0%	8.0%	3.0%	2.0%		
All respondents	1618 (83.3%)	90 (4.6%)	151 (7.8%)	42 (2.2%)	41 (2.1%)	1942	
Gender							
Male <sup>A#</sup>	873 (87.6%)	43 (4.3%)	52 (5.2%)	13 (1.3%)	16 (1.6%)	997	B
Female <sup>B</sup>	745 (78.8%)	47 (5.0%)	99 (10.5%)	29 (3.1%)	25 (2.6%)	945	A
Background							
Capital city <sup>C</sup>	820 (81.8%)	59 (5.9%)	76 (7.6%)	23 (2.3%)	25 (2.5%)	1003	E
Rural city/town <sup>D</sup>	469 (81.7%)	18 (3.1%)	53 (9.2%)	18 (3.1%)	16 (2.8%)	574	E
Farm <sup>E</sup>	329 (90.1%)	13 (3.6%)	22 (6.0%)	1 (0.3%)	0 (0.0%)	365	C, D
Years after graduation							
<5 <sup>F</sup>	199 (74.5%)	15 (5.6%)	34 (12.7%)	10 (3.7%)	9 (3.4%)	267	H, I, J
5–10 <sup>G</sup>	215 (77.6%)	15 (5.4%)	32 (11.6%)	11 (4.0%)	4 (1.4%)	277	H, J
11–15 <sup>H</sup>	279 (87.2%)	7 (2.2%)	20 (6.3%)	5 (1.6%)	9 (2.8%)	320	F, G
16–20 <sup>I</sup>	208 (83.5%)	16 (6.4%)	18 (7.2%)	4 (1.6%)	3 (1.2%)	249	F
>20 <sup>J</sup>	714 (86.7%)	35 (4.2%)	47 (5.7%)	12 (1.6%)	16 (1.9%)	824	F, G
Professional relationship							
Principal <sup>K</sup>	681 (86.1%)	43 (5.4%)	43 (5.4%)	9 (1.1%)	15 (1.9%)	791	L
Associate <sup>L</sup>	659 (79.0%)	36 (4.3%)	91 (10.9%)	27 (3.2%)	21 (2.5%)	834	K

\*Lovibond and Lovibond.<sup>14</sup>

<sup>#</sup>Significant differences between categories of each variable (gender, background, years after graduation, type of practice/work, and professional relationship) are indicated in the last column (P < 0.05,  $\chi^2$  test). Categories are identified by letter in the first column.

DASS, Depression, Anxiety and Stress Scales.

K10 scores (>22), compared with the reference category of males and >20 years post-graduation, respectively. Female veterinarians (OR 2.3, 95% CI 1.9–2.9) and veterinarians from a rural city/town (OR 1.4, 95% CI 1.0–1.9) were more likely to be associated with high and very high personal burnout scores. Veterinarians who were <15 years post-graduation had greater odds of being in the high and very high categories of client burnout compared with the reference category of >20 years after graduation. The OR varied from 2.7 (95% CI 2.0–2.6) for <5 years to 1.5 (95% CI 1.1–2.0) for veterinarians between 11 and 15 years post-graduation (Table 7).

### Discussion

We report the results of a large-scale postal survey of registered veterinarians, which demonstrate that veterinarians have higher levels of depression, stress and burnout in comparison with the reference (normative) data, although fewer report anxiety.

Potential sources of errors in questionnaires include selection bias when the sample is not randomised, non-response bias when the response is low and a non-representative sample.<sup>16</sup> In this study, all eligible participants were included, but the response rate of 27.9% could give rise to a non-response bias. The only demographic data available are from New South Wales, where 44% of veterinarians are female, 43.5% are companion animal practitioners and 16.9% mixed

animal practitioners,<sup>17</sup> compared with 48.6% female, 52.4% companion animal practitioners and 21.6% mixed animal practitioners in this study. A comparison of the limited demographic data with the results of this survey shows that any bias in demographic characteristics of the respondents is likely to be small.

The Kessler K10, a population measure of psychological distress, has been used by both Federal and State jurisdictions and that data can be used for comparison with the veterinary profession. A Western Australian study of veterinarians using the same groupings produced the following percentages: low 47%, moderate 32%, high 17% and very high 5% (H Fairnie, pers. comm. 2006) compared with 54.3%, 30.8%, 10.2% and 4.8%, respectively, for the present study. The percentage classified as very high is similar in both studies.

The Kessler K10 is a measure of non-specific psychological distress and does not differentiate between the negative affective states of depression or anxiety, whereas the DASS self-report questionnaire differentiates between depression and anxiety, as well as stress or tension, but defining that state is problematic. The inclusion of stress in the negative affective states is in itself problematic, as it frequently precipitates the anxious and depression states even though stressful events give rise to chronic arousal and impaired function.<sup>14</sup>

Two periods of increased anxiety were identified. The first was in the initial 5 years after graduation, when there is uncertainty regarding

**Table 4.** Distribution of DASS stress scores among veterinarians

	DASS stress categories					Total	Significant difference to category <sup>#</sup>
	Normal	Mild	Moderate	Severe	Extremely severe		
Reference baseline data*	78%	9.0%	8.0%	3.0%	2.0%		
All respondents	1324 (69.4%)	224 (11.7%)	203 (10.6%)	133 (7.0%)	24 (1.3%)	1908	
Gender							
Male <sup>A,#</sup>	722 (72.4%)	98 (9.8%)	92 (9.2%)	61 (6.1%)	24 (2.4%)	997	B
Female <sup>B</sup>	602 (63.7%)	126 (13.3%)	111 (11.7%)	72 (7.6%)	34 (3.6%)	945	A
Background							
Capital city <sup>C</sup>	662 (66.0%)	115 (11.5%)	113 (11.3%)	84 (8.4%)	29 (3.0%)	1003	E
Rural city/town <sup>D</sup>	384 (66.9%)	68 (11.8%)	63 (11.0%)	36 (6.3%)	23 (4.0%)	574	E
Farm <sup>E</sup>	277 (75.9%)	43 (11.8%)	26 (7.1%)	13 (3.6%)	6 (1.6%)	365	C, D
Years after graduation							
<5 <sup>F</sup>	160 (59.9%)	38 (14.2%)	29 (10.9%)	24 (9.0%)	16 (6.0%)	267	H, I, J
5–10 <sup>G</sup>	175 (62.1%)	31 (11.0%)	37 (13.1%)	25 (8.9%)	14 (5.0%)	282	J
11–15 <sup>H</sup>	227 (70.9%)	38 (11.9%)	27 (8.4%)	20 (6.3%)	8 (2.5%)	320	F
16–20 <sup>I</sup>	165 (66.3%)	32 (12.9%)	30 (12.0%)	20 (8.0%)	2 (0.8%)	249	F
>20 <sup>J</sup>	566 (72.5%)	87 (11.0%)	79 (10.1%)	44 (5.6%)	5 (0.6%)	781	F, G
Professional relationship							
Principal <sup>K</sup>	563 (71.2%)	93 (11.8%)	72 (9.1%)	47 (5.9%)	16 (2.0%)	791	L
Associate <sup>L</sup>	539 (64.6%)	96 (11.5%)	90 (10.8%)	73 (8.8%)	36 (4.3%)	834	K

\*Lovibond and Lovibond.<sup>14</sup> Normative data from representative Danish population on personal burnout.<sup>18</sup>

<sup>#</sup>Significant differences between categories of each variable (gender, background, years after graduation, type of practice/work, and professional relationship) are indicated in the last column ( $P < 0.05$ ,  $\chi^2$  test). Categories are identified by letter in the first column.

DASS, Depression, Anxiety and Stress Scales.

skills and the application of theoretical knowledge to the practical situation. The next is at 10–15 years after graduation, which coincides with a period of increasing responsibilities of practice ownership and increasing family responsibilities, which is especially applicable to female veterinarians.

A number of factors could be related to the higher levels of depression noted in small animal and mixed animal practitioners. These include the human–animal bond of clients, client expectations, unexpected outcomes of veterinary care, as well as professional and social isolation and long working hours, including on-call duties.<sup>19</sup> Equine practitioners were also in this group, but at the time of the survey an equine influenza epidemic had occurred in New South Wales and Queensland. Increased morbidity was noted in similar circumstances in the UK during the 2001 foot and mouth disease epidemic.<sup>20</sup>

Graduates who began their university course in 1985–86 were asked to self-assess their stress levels and 80% reported experiencing stress or burnout.<sup>9</sup> It has been postulated that there is progression from personal factors related to career choice through the negative effects of undergraduate training and to work-related stressors leading to psychological morbidity. The negative effects of undergraduate training have been attributed to curriculum, extramural studies, financial difficulties and psychosocial factors, establishing poor coping strategies. In the work environment, stressors include long hours, client expectations, inadequate support, emotional exhaustion, unexpected out-

comes and perceived low intrinsic and extrinsic rewards, which all contribute to career disenchantment. These stressors give rise to feelings of entrapment, depression, cognitive distortion, negative thoughts about self, ruminative thinking and hopelessness.<sup>9</sup> Compounding this is a false belief in coping and a perceived stigma in seeking help. The emotional exhaustion and disenchantment with career choice can be features of both the depression and burnout constructs; the former being related to varied predeterminants but the latter the result of workplace stressors. The depression and burnout constructs overlap and are related, with major depressive episodes frequently involving the burnout experience. This overlap necessitates, where they occur concurrently, interventions at both the personal level and in the workplace.

Burnout results from chronic workplace stress and, for undergraduates, the university can be considered to be the workplace. The high percentage of burnout (55%) noted in the first 5 years after graduation could be partially the result of stress as a student. With increasing years from graduation, the percentage classified with burnout decreased, but after 20 years the percentage was still above reference percentages, even with the attrition rate of 30% described by Heath.<sup>9</sup> A study of medical graduates found 39% were classified as suffering burnout at graduation, increasing to 75% during internship years, as assessed by the Maslach Burnout Inventory.<sup>21</sup> For veterinarians, as the years after graduation increase, the percentage classified as suffering

**Table 5. Percentages of Australian veterinarians in each category of the Copenhagen Burnout Inventory (CBI)**

Reference data*	CBI category					
	Personal burnout		Work burnout		Client burnout	
	22.2%		19.7%		16.6%	
	n		n	n		
All respondents	1945	721 (37.0%)	1946	687 (35.8%)	1933	481 (24.8%)
Gender						
Male	998	246 (24.7%)	999	263 (26.4%)	993	208 (24.8%)
Female	947	475 (50.2%)	947	423 (44.7%)	940	273 (29.0%)
University						
Queensland	565	205 (36.3%)	565	190 (33.6%)	562	146 (25.8%)
Melbourne	377	148 (39.3%)	377	139 (36.9%)	376	97 (25.8%)
Sydney	562	192 (34.2%)	562	188 (33.5%)	555	117 (21.1%)
Murdoch	286	120 (41.0%)	287	115 (39.1%)	286	77 (27.0%)
Other	155	56 (37.8%)	155	55 (37.2%)	154	44 (27.6%)
Background						
Capital city	1007	381 (37.8%)	1007	369 (36.6%)	1007	260 (26.0%)
Rural city/town	573	232 (40.5%)	574	218 (38.0%)	574	147 (25.7%)
Farm	365	108 (29.6%)	365	108 (29.6%)	356	74 (20.4%)
Years after graduation						
<5	267	154 (57.7%)	267	56 (50.2%)	266	98 (36.8%)
6–10	282	132 (46.8%)	283	60 (45.5%)	283	98 (34.6%)
11–15	322	133 (41.3%)	322	95 (35.4%)	322	82 (25.5%)
16–20	249	90 (36.1%)	249	102 (41.0%)	245	59 (24.1%)
>20	825	212 (25.7%)	825	211 (20.7%)	817	144 (17.6%)
Type of practice/work						
Companion animal	1018	407 (40.0%)	1019	404 (39.6%)	1019	290 (28.5%)
Large animal	31	5 (16.1%)	31	4 (12.9%)	31	2 (6.5%)
Mixed	420	166 (39.5%)	420	149 (35.5%)	418	94 (22.5%)
Consultancy/specialist	127	30 (23.6%)	127	29 (22.8%)	127	28 (22.0%)
Equine	85	32 (37.6%)	85	28 (32.9%)	85	20 (23.5%)
Salaried	264	81 (30.7%)	264	73 (27.7%)	263	47 (18.6%)
Professional relationship						
Principal	793	236 (29.8%)	793	238 (30.0%)	792	156 (19.7%)
Associate	835	391 (46.8%)	835	368 (44.0%)	834	271 (32.5%)

\*2001 Australian Bureau of Statistics health survey of the Australian population.<sup>15</sup>

burnout decreases, but even after a significant number have left the profession, it still remains 25% above the reference data for personal burnout, although work- and client-related burnout approach the reference data percentages. A similar finding of decreasing burnout with increasing years from graduation occurred in veterinarians in Finland.<sup>2</sup>

The veterinary undergraduate course has been described as having the potential to stifle communication skills and emotional intelligence.<sup>19</sup> It follows that if communication, coping and cognitive skills were included in the curriculum then depression, anxiety, stress and burnout could be reduced in graduates. Burnout is frequently

attributed to the individual but is a result of workplace stress and therefore primarily a problem of the workplace where management changes and individual skills training are required to fully address this issue.

Veterinarians whose formative years were on a farm or agricultural enterprise environment were consistently more often in the lower categories for all measurements. The reason is not evident from this study, but these backgrounds may produce a clearer understanding of the cycle of life and possession of greater coping skills. The nature of the client–work relationship of large animal practitioners differs in the time spent with individual clients (herd problems,

**Table 6.** Odds ratio (OR) and 95% confidence interval (CI) for variables found to significantly affect the severe and extremely severe categories stress and depression determined by multivariate logistic regression analysis

	DASS (stress)			DASS (depression)		
	OR	CI	P-value	OR	CI	P-value
<b>Background</b>						
Capital city	–	–	–	2.55	1.07–6.06	0.03
Rural city/town	–	–	–	3.07	1.25–7.49	0.01
Farm	ref	ref	–	ref	ref	–
<b>Years after graduation</b>						
<5	2.66	1.35–5.24	0.01	–	–	–
5–10	2.11	1.01–4.40	0.05	–	–	–
11–15	1.20	0.51–2.82	0.67	–	–	–
16–20	0.37	0.08–1.60	0.18	–	–	–
>20	ref	ref	–	ref	ref	–

DASS, Depression, Anxiety and Stress Scales; ref, reference data.

**Table 7.** Odds ratio (OR) and 95% confidence interval (CI) for variables found to significantly affect the high and very high categories of burnout and Kessler K10 score >50 determined by multivariate logistic regression analysis

	Kessler K10			Burnout (personal)			Burnout (work)			Burnout (client)		
	OR	CI	P-value	OR	CI	P-value	OR	CI	P-value	OR	CI	P-value
<b>Gender</b>												
Male	ref	ref	–	ref	ref	–	ref	ref	–	ref	ref	–
Female	1.58	1.23–2.04	0.00	2.32	1.88–2.86	>0.01	1.65	1.33–2.03	>0.01	–	–	–
<b>Background</b>												
Capital city	–	–	–	1.16	0.88–1.52	0.29	1.21	0.92–1.61	0.18	–	–	–
Rural city/town	–	–	–	1.38	1.03–1.85	0.03	1.40	1.04–1.88	0.03	–	–	–
Farm	ref	ref	–	ref	ref	–	ref	ref	–	ref	ref	–
<b>Type of practice/work</b>												
Companion animal	ref	ref	–	ref	ref	–	ref	ref	–	ref	ref	–
Large animal	–	–	–	–	–	–	0.32	0.11–0.94	0.04	0.19	0.04–0.79	0.02
Mixed	–	–	–	–	–	–	0.84	0.65–1.09	0.19	0.68	0.52–0.90	0.01
Consultancy/specialist	–	–	–	–	–	–	0.55	0.35–0.86	0.01	0.80	0.51–1.26	0.34
Equine	–	–	–	–	–	–	0.85	0.52–1.39	0.51	0.81	0.48–1.37	0.43
Salaried	–	–	–	–	–	–	0.72	0.53–0.98	0.04	0.68	0.48–0.97	0.03
<b>Years after graduation</b>												
<5	1.94	1.39–2.73	0.00	2.64	1.96–3.55	>0.01	2.22	1.64–3.01	>0.01	2.69	1.99–3.64	>0.01
5–10	1.47	1.04–2.09	0.03	1.63	1.21–2.20	>0.01	1.61	1.19–2.17	>0.01	2.19	1.61–2.98	>0.01
11–15	1.30	0.91–1.84	0.15	1.65	1.23–2.21	>0.01	1.40	1.04–1.87	0.03	1.49	1.08–2.05	0.02
16–20	1.05	0.71–1.56	0.80	1.45	1.06–1.99	0.02	1.71	1.25–2.34	>0.01	1.39	0.98–1.97	0.07
>20	ref	ref	–	ref	ref	–	ref	ref	–	ref	ref	–

Ref, reference data.

obstetric cases etc.) than occurs in other types of practice that result in long-term friendships and relationships with the animals' owners.

Further research is needed to clarify many of the issues identified. A longitudinal study using validated measurement techniques extend-

ing from matriculation through university years and into the veterinary career would clarify the issues. Such a study would ideally be of the lifespan and a minimum of 25 years would be valuable, but would require the commitment of a research organisation. Specifically targeting high-risk or high-occurrence groups could provide causal information and techniques to manage the issues.

### Conclusion

Veterinarians as a group are overrepresented for psychological distress and more specifically for depression and stress states as defined by the DASS, but not for anxiety, when compared with normative data. The main determinants of depression, stress and burnout are female gender, years after graduation and being a companion animal, mixed or equine veterinary practitioner or an associate in a veterinary practice.

These findings suggest that the absence of communication, coping and cognitive skills training from a course primarily focused on the acquisition of veterinary skills may initiate the process of burnout and poor mental health. Although further research is needed to verify this conclusion, it is probable that if appropriate communication, coping and cognitive skills were provided to undergraduate and graduate veterinarians then levels of depression, stress and burnout would be reduced.

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