

# Psychological well-being of Australian veterinarians

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**Objective** To use established psychological scales to measure levels of distress, anxiety and depression in veterinarians, and compare these levels between different veterinary subgroups and other professional groups.

**Methods** A cohort of veterinarians was identified through contact with veterinary schools in Australia. Participants completed a self-reporting questionnaire that included queries about general health and demographics, psychological well-being, job-specific perceptions of health, dispositional characteristics and social support.

**Results** Of the 2125 respondents who completed the psychological questionnaire, approximately one-third reported poor psychological health. Increasing age, increasing time in current job, increasing years since graduation and male gender was associated with fewer signs of distress, anxiety and depression. Compared with the general population, veterinarians experienced more negative emotions at work, but were similar to other professional groups.

**Conclusions** Poor psychological health is common in the profession and professional veterinary bodies may wish to consider providing training in dealing with work-related distress, anxiety and depression.

**Keywords** anxiety; depression; distress; veterinarians

**Abbreviations** GHQ, General Health Questionnaire

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Anecdotal, disturbances in psychological well-being are a major problem in the veterinary profession. Causes include professional issues, such as dealing with difficult or upset animal owners, and the emotional issues surrounding animal euthanasia.<sup>1</sup> In addition, most veterinarians are managing their own small business and therefore are dealing with issues such as finances, staff and regulatory requirements. Further, many veterinarians work long hours and the difficulty of recruiting locums limits holiday opportunities. In rural areas, these difficulties are compounded by professional isolation and lower remuneration because of the rural economic depression.<sup>2</sup> A recent study estimated that the rate of suicide in veterinarians in Western Australia and Victoria was three to four times the rate of the general population and called for investigation into the factors contributing to this high rate.<sup>3</sup>

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Despite this, few systematic studies of psychological well-being in the veterinary profession have been undertaken. Previous studies have asked respondents to subjectively assess their 'stress' without further defining this term.<sup>4,5</sup> Although there are several studies of veterinary students that have found moderate levels of stress (using custom-made scales), the main causes of stress in this group seem to be academic coursework demands.<sup>6</sup> Only one previous study<sup>7</sup> has used established psychological scales to assess psychological well-being in practising veterinarians by assessing levels of burnout<sup>8</sup> (where burnout was defined as having high scores on dimensions of exhaustion, cynicism and professional inefficacy).

We have undertaken a survey of health status and potentially hazardous exposures in qualified veterinarians in a study known as the Health Risks of Australian Veterinarians.<sup>9,10</sup> The questionnaire for that study included the use of established psychological scales to assess the level of distress (defined as a score above 2 on the 12-item version of the General Health Questionnaire, GHQ), and anxiety and depression (measured using Warr's work-related affect scales).<sup>11,12</sup> In this current paper, we compared the levels of general psychological distress, work-related anxiety and depression in the profession and among different subgroups of the veterinary profession.

## Materials and methods

### Participants

The cohort of Australian veterinarians who participated in this study has been described previously.<sup>9,10</sup> Lists of graduates between 1960 and 2000 were obtained from the alumni organisations of the four veterinary schools in Australia (n = 7928). Current addresses of veterinarians were obtained from State Veterinary Registration Board lists and national and overseas organisations. There were 69 (0.1%) veterinarians on the lists who were known to be deceased, 501 (6%) who were known to be living overseas, and no current address was found for 1612 (22%). Invitations to participate in the study, including an information sheet, a consent form, and the questionnaire were sent to 5746 subjects for whom a current Australian address could be found. Potential participants who did not respond to the first mail-out were sent a postcard as a reminder to return their questionnaire. Of the 2800 veterinarians who returned their questionnaires, 2125 completed the psychological scales, representing an overall response fraction of 37%.

### Survey instrument

The questionnaire sent to the veterinarians sought personal information (date of birth, gender, university and year of graduation) and a number of descriptive details regarding their jobs. For the current job, we asked the type of job (classified as clinical or other), the practice type (classified as small, mixed or large animal), the years in that job, the number of hours spent at work, in surgery and driving for work purposes per week, and the number of X-rays taken per week. Anyone who did not answer the questions relating to hours in surgery or driving or taking X-rays was assumed not to do that task, providing there were no other significant omissions from the questionnaire.

In addition, three well-established psychometric scales were used as indices of current psychological well-being: The General Health Questionnaire (GHQ-12)<sup>11</sup> and Warr's work-related affect scales (Anxiety/Contentment and Depression/Enthusiasm).<sup>12</sup> The GHQ is a well-known measure of general psychological well-being. It has good psychometric properties, with Cronbach's alpha reported to be between 0.82 and 0.86.<sup>11</sup> A typical item asks 'Have you recently felt constantly under strain?' with answers of 'Not at all', 'No more than usual', 'Rather more than usual' and 'Much more than usual'. The GHQ-12 was scored using the binary scoring method (0-0-1-1). Psychological distress was defined as scoring above 2 when the responses are summed across the 12 items.<sup>11</sup>

Although it is a widely used measure in the organisational stress literature, the GHQ seeks information regarding general rather than job-specific psychological well-being. Consequently, Warr's work-related affective well-being scales were used to identify specific levels of distress attributed to job characteristics.<sup>12</sup> As the name suggests, Warr's scales measure (a) feelings of anxiety/contentment and (b) depression/enthusiasm directly resulting from work. There are six items in each of the two scales. Example items include the following: 'Thinking of the past few weeks, how much of the time has your job made you feel contented?' The response format follows a 6-point Likert-type scale with answers ranging from 1 'Never' to 6 'All of the time'. The overall scores for both scales were calculated separately by taking the mean of the scores for the six feelings relating to each scale. The Cronbach's alphas are 0.76 and 0.80 for the anxiety/contentment and depression/enthusiasm scales, respectively.<sup>12</sup> For the Warr scales, higher scores denote better health, which is the reverse of the GHQ.

We also used the Positive and Negative Affect Scale to measure traits akin to optimism and pessimism.<sup>13</sup> It is used to adjust the scores for distress, anxiety and depression for the innate tendency of a subject to be either positive or negative. Twenty words are used to describe different feelings and emotions and respondents are asked to indicate to what extent they generally feel that way. Example items include 'Irritable' or 'Inspired'. The mean scores for the positive and negative affect scales were calculated separately using a scoring system of 1 to 5 (Never to Always). Cronbach's alphas are 0.89 for the positive affect scale and 0.85 for the negative affect scale.<sup>14</sup>

An additional correlate of distress, anxiety and depression is social support outside work.<sup>15</sup> As veterinarians often work alone, the impact of social support at home was hypothesised to be an important covariate of stressful work conditions and we wanted to control for these when assaying the impact of work conditions on psychological well-being. Data regarding perceptions of social support at home were collected via an 11-item scale developed for this study and not previously published. An example item is 'If I had a problem at work, there would be at least one sympathetic person (friend or family member) who would listen and care'. This scale was scored using a 4-point Likert-type response format (1, strongly agree; 4, strongly disagree). Exploratory factor analysis revealed that the scale assessed only one meaningful interpretable principal component with an eigen value of 3.38 accounting for 37.5% of the variance in the data. A second component was revealed, but it consisted of two items only that were unique to it. A re-analysis of the entire scale constraining the solution to only one component revealed that all items loaded on to the component, with the smallest factor loading

being 0.49. The percentage variance explained was 44.88%. The psychometric properties of this scale were also acceptable, with Cronbach's alpha equal to 0.83 in our study.

### Statistical analysis

The proportion of respondents scoring above 2 on the GHQ scale and hence defined as psychologically distressed was compared by gender, practice type, years in current job, decade of graduation, hours spent working, hours in surgery, number of X-rays taken per week and number of hours spent driving per week. Chi-squared tests were used to determine statistical significance of any differences.

The mean scores for Warr's two scales were calculated, and one-way analyses of variance and t-tests were used to assess statistical significance for the same range of demographic characteristics as those analysed for the GHQ.

The impact of individual predisposition in terms of positive and negative affect and the inoculating effect of non-work social supports were controlled by means of multivariate models. In order to adjust for these effects, a logistic regression model was developed with psychological distress (as measured by a score > 2 on the GHQ-12) as the outcome variable. The effect on the GHQ of gender, graduation year, type of practice and hours at work were examined in the multivariate logistic regression models, after controlling for positive and negative affect and social support. Age was not included in the models, as it was highly correlated with graduation year.

Similar models using linear regression were used to examine the effect of the same variables on job-related anxiety and depression.

## Results

This analysis uses only those respondents who completed the psychological scales ( $n = 2125$ ). They were similar to those who did not complete the scales ( $n = 675$ ) with regard to gender ( $P = 0.98$ ) and work hours ( $P = 0.42$ ). Of those excluded, 20.4% graduated in the 1960s compared with 9.1% of those included. In addition, those in non-clinical jobs were much less likely to be included (41.1% of excluded subjects vs 15.9% of included subjects).

In the univariate analyses, more females than males were found to have a score above 2 on the GHQ (i.e. were deemed to be distressed), and females also had significantly more anxiety and depression (Table 1). It should be noted, however, that this pattern of results is also usually reflected in the wider community. There was a clear trend with age, with younger veterinarians more likely to be distressed, anxious or depressed than older ones. Small animal and mixed practice veterinarians had more anxiety and depression than other practitioners, but the different types of practitioners did not score significantly differently on the GHQ. The longer veterinarians were in a particular job, or the earlier they had graduated, the less likely they were to report distress, anxiety and depression.

Work hours, and hours spent doing various tasks did not seem to have a great influence on psychological scores (Table 2). However, those who did no surgery, or those who took no X-rays, were slightly less anxious or depressed than those who did undertake these tasks.

After adjusting for the control psychological variables and other variables in the model, there were no significant differences between male and female veterinarians and veterinarians in different practice

**Table 1. Measures of psychological health associated with demographic and practice factors**

Factor	n <sup>a</sup>	% GHQ score > 2 ( $\chi^2$ , df, P value)	Mean Anxiety/Contentment score (P value)	Mean Depression/ Enthusiasm score (P value)
<b>Gender</b>				
Male	1217	29.7	4.04	4.46
Female	908	37.6	3.72	4.31
		(14.6, 1, < 0.001)	(< 0.001)	(< 0.001)
<b>Age (years)</b>				
20–29	417	41.3	3.66	4.26
30–39	708	33.3	3.85	4.36
40–49	528	34.9	3.83	4.31
50–59	401	24.7	4.23	4.60
≥ 60	71	15.5	4.55	4.89
		(36.0, 4, < 0.001)	(< 0.001)	(< 0.001)
<b>Practice type</b>				
Small	1047	33.1	3.83	4.34
Mixed	641	34.8	3.92	4.41
Large	351	29.6	4.04	4.47
Non-animal	84	32.1	4.11	4.58
		(2.8, 3, 0.4)	(< 0.001)	(0.007)
<b>Years in job</b>				
0–2	704	37.6	3.78	4.35
3–8	699	33.6	3.84	4.34
≥ 9	722	28.0	4.09	4.48
		(15.2, 2, < 0.001)	(< 0.001)	(0.002)
<b>Graduation decade</b>				
1960–69	194	21.1	4.41	4.72
1970–79	485	28.5	4.04	4.46
1980–89	597	33.2	3.86	4.36
1990–2000	849	38.3	3.74	4.30
		(27.6, 3, < 0.001)	(< 0.001)	(< 0.001)

<sup>a</sup>Missing data: job type (4); practice type (2); work hours (37).  
df, degrees of freedom.

types for psychological distress (Table 3). Veterinarians graduating after 1990 were more likely to be psychologically distressed than those who graduated before 1970 (odds ratio 1.98, 95% confidence interval 1.26–3.10). Working hours tended to be positively associated with distress, but the actual size of the effect was small. The time spent doing various work-related tasks (X-rays, surgery, driving) was not statistically significantly associated with distress, so was omitted from the model.

After adjusting for the control psychological variables and the other variables in the model (Table 4), scores on the Anxiety/Contentment scale were worse in females ( $P < 0.001$ ). Males and females had similar Depression/Enthusiasm scores ( $P = 0.7$ ). Although the actual effect size was small (decrease of 0.005 points in the score for

every added hour increase in hours worked), anxiety and depression did tend to increase with increasing working hours ( $P < 0.001$  for both affective measures). Adding the variables regarding X-rays, surgery and driving did not improve the fit of either of these linear regression models.

### Discussion

We found that approximately one-third of veterinarians report poor psychological health as defined in this study. The mean responses on Warr's work-related affect scales indicate that the sample of veterinarians as a whole is not experiencing high levels of anxiety and depression that can be attributed as a direct consequence of the job.<sup>12</sup>

**Table 2. Measures of psychological health associated with work-related exposures**

Factor	n <sup>a</sup>	% GHQ score > 2 ( $\chi^2$ , df, P value)	Mean Anxiety/Contentment score (P value)	Mean Depression/Enthusiasm score (P value)
<b>Work hours</b>				
0–39	488	29.9	3.91	4.38
40–49	698	33.0	3.90	4.37
50–59	485	32.4	3.93	4.46
≥ 60	417	36.5	3.87	4.37
		(4.4, 3, 0.2)	(0.8)	(0.2)
<b>Surgery hours</b>				
0	391	30.7	4.07	4.52
< 9	941	32.6	3.88	4.37
≥ 9	793	34.7	3.85	4.36
		(2.0, 2, 0.4)	(< 0.001)	(0.003)
<b>X-rays</b>				
0	447	30.2	4.10	4.52
< 6	953	33.5	3.86	4.35
≥ 6	725	34.2	3.84	4.38
		(2.2, 2, 0.3)	(< 0.001)	(0.001)
<b>Driving hours</b>				
0	591	34.5	3.85	4.36
< 7	956	32.4	3.88	4.38
≥ 7	578	32.5	4.01	4.45
		(0.8, 2, 0.7)	(0.004)	(0.1)

<sup>a</sup>Missing data: job type (4); practice type (2); work hours (37).  
df, degrees of freedom.

The mean responses also indicate that, on the whole, the sample was more content and enthused about their jobs as opposed to anxious and depressed. This is not to deny that some in the sample reported significant distress. Over 35% report experiencing more anxiety than the midpoint of the scale, with 3.1% of the total reporting extreme anxiety (score < 2). There was less reporting of depression, with 18% reporting more depression than the midpoint of the scale and less than 1% of all respondents reporting extreme depression (score < 2).

In our study, 30% of male veterinarians and 38% of female veterinarians scored above 2 on the GHQ scale. Benchmarking studies are carried out in large samples to give researchers a standard with which to compare results on these psychological scales. In a UK benchmarking study, 33% of male professionals (mainly doctors and allied health workers in the National Health Service) and 46% of 2305 female professionals scored above 2.<sup>16</sup> In comparison, 32% of male and 29% of female clerical workers scored above 2. Surveys of general practitioners have found 52% of British respondents and 31% of respondents in New Zealand scored above 2 on the GHQ.<sup>17,18</sup>

In the present study, the veterinarians mean scores on the Anxiety/Contentment scale were 4.04 for males and 3.72 for females, which is slightly worse (i.e. more anxiety in the veterinarians) than the benchmarking scores in the general population of 4.12 for men and

4.22 for women.<sup>16</sup> However, the benchmarking score for professional and managerial workers (those in relatively senior positions and classified as levels A or B by the UK Registrar General) was 3.96, suggesting that male veterinarians are less anxious than other professionals, while female veterinarians are slightly more anxious. Most veterinarians (65%) scored above the median of the scale, suggesting that they were, on balance, more content than anxious with their work. The percentage of respondents who scored below halfway on the scale varied with graduation year: 1960s (13.8%), 1970s (23.4%), 1980s (29.9%) and 1990–2000s (36.2%).

For the Depression/Enthusiasm scores, our findings of 4.46 in men and 4.31 in women (compared with 4.48 and 4.62 in the benchmarking study) suggest that male veterinarians are as similarly depressed as all men, whereas female veterinarians are slightly more depressed. The veterinarians (mean 4.61) were less enthusiastic than the professional and managerial workers in the benchmarking study: 82% of veterinarians scored above halfway on the Depression/Enthusiasm scale, suggesting that they were more enthusiastic than depressed about their work. Of the earliest graduates (prior to 1970), only 6.5% were below halfway on the scale, while graduates from the 1970s, 1980s and since 1990 had similar proportions reporting depression below the midpoint (12.2%, 14.9% and 14.9%, respectively).

**Table 3. Logistic regression for psychological distress (General Health Questionnaire score > 2) adjusting for social support, positive and negative affect, and other variables**

Factor	GHQ Wald coefficient (95% CI)
<b>Gender</b>	
Male	1.0
Female	1.13 (0.89, 1.44)
<b>Practice type</b>	
Small	1.0
Mixed	1.12 (0.87, 1.43)
Large	1.06 (0.78, 1.45)
Non-animal	1.40 (0.77, 2.56)
<b>Graduation decade</b>	
1960–69	1.0
1970–79	1.20 (0.76, 1.88)
1980–89	1.47 (0.94, 2.30)
1990–2000	1.98 (1.26, 3.10)
Working hours (per hour)	1.01 (1.00, 1.02)

CI, confidence interval.

**Table 4. Linear regression of Warr's scales for work-related affect adjusting for social support, positive and negative affect, and all other variables**

Factor	Anxiety/Contentment Beta (95% CI)	Depression/Enthusiasm Beta (95% CI)
<b>Gender</b>		
Male	Baseline	Baseline
Female	-0.12 (-0.198, -0.06)	0.01 (-0.05, 0.07)
<b>Practice type</b>		
Small	Baseline	Baseline
Mixed	0.04 (-0.02, 0.11)	0.01 (-0.05, 0.06)
Large	0.01 (-0.07, 0.09)	-0.03 (-0.10, 0.04)
Non-animal	0.09 (-0.07, 0.24)	0.10 (-0.04, 0.23)
<b>Graduation decade</b>		
1960–69	Baseline	Baseline
1970–79	-0.21 (-0.32, -0.10)	-0.14 (-0.24, 0.05)
1980–89	-0.31 (-0.42, -0.20)	-0.18 (-0.28, -0.09)
1990–2000	-0.36 (-0.47, -0.25)	-0.22 (-0.31, -0.12)
Working hours	-0.01 (-0.01, -0.00)	0.00 (-0.01, -0.00)
Adjusted R <sup>2</sup>	0.479	0.566

CI, confidence interval.

As in previous research,<sup>4,7,16</sup> we found that females tended to score worse on the mental health measures than males. However, we found that adjustment for social support and positive and negative affectivity reduced this effect, such that the difference was statistically significant only for Anxiety/Contentment.

Previous surveys have often simply asked veterinarians if they feel 'stressed',<sup>4,5</sup> although there is no evidence of the validity of that type of question. In Australia, a small survey found 75% of practitioners believed that their veterinary work caused them a considerable amount of 'stress'.<sup>4</sup> A survey of veterinary students using a custom-made scale reported that more than 50% felt tired and fatigued over the previous month.<sup>6</sup> In Finland, Reijula et al<sup>7</sup> surveyed 775 veterinarians and found that 73% reported being 'rather or very stressed'. Using a validated burnout scale, 40% of the Finnish respondents were found to have moderate symptoms of burnout and 1.7% had severe symptoms.<sup>7</sup>

There was a clear trend towards increasing distress, anxiety and depression in more recent graduates in our univariate analyses. Similar findings were reported from surveys of veterinarians in Finland and New Zealand<sup>5,7</sup> and two possible explanations are offered. First, with experience (work experience or life experience associated with age), one develops skills for coping. In our study, 36% of veterinarians graduating since 1990 reported more anxiety than contentment at work, compared with only 14% of graduates from the 1960s, with a clear trend for decreased anxiety with longer time in the profession. The trend for depression was not as strong; although only 6.5% of 1960s graduates reported below the midpoint of the scale, there was not much difference by graduation year for the other participants. Although a veterinarian's job is demanding, the level of

autonomy experienced by veterinarians is relatively high and this affords the opportunity to develop skills for dealing with job stressors. A second possibility is that veterinarians who find clinical practice extremely stressful may have left clinical work or the profession or not responded to our survey and so are not represented in our sample. There is little information available on this issue. A study that re-surveyed veterinary students 10 years after graduation found that 20% of veterinarians were no longer in veterinary practice, but there was no information on the reasons for this career move.<sup>4</sup> A study from New Zealand found that lack of technical skills caused most concern in veterinarians under the age of 34 compared with other ages.<sup>5</sup>

Increasing hours of work seem to increase distress and anxiety, although this only emerged clearly after adjusting for other factors. Finnish veterinarians felt that reducing hours of work or reducing on-call time would be appropriate ways to reduce distress.<sup>7</sup> In New Zealand, hours worked was considered one of the main stressors in veterinary work.<sup>5</sup>

There did not seem to be any relationship in our data between the type of practice and mental health. Because veterinarians have their choice of type of practice, individuals probably choose the type of animal with which they are most comfortable working. Heath found that when asked their preferences, most veterinarians were content with the species with which they worked and that satisfaction was similar for different types of practitioners.<sup>4</sup> Similarly, there was no strong relation between distress and the amount of time spent in surgery, taking X-rays and the number of hours spent driving.

The advantages of this study include the large sample size and the fact that it included veterinarians in all branches of the profession, including non-clinical jobs. Previous studies have had many fewer respondents<sup>4,19</sup> or concentrated on one subgroup such as rural veterinarians.<sup>2</sup>

We used established psychological scales with known reliability and validity and compared the results to benchmarks. We were also able to control for the effects of personality type and positive social support.

The main limitation to our study is the low response rate and the possibility of selection bias. The direction of any bias is unclear. More distressed veterinarians may have not responded to the survey to avoid additional tasks or, alternatively, may have been more likely to respond as it gave them an opportunity to discuss an important issue. We have no data on the psychological health of non-respondents, so are unable to explore this further.

In conclusion, we found that poor psychological health is quite common among veterinarians, although the levels of distress, anxiety and depression are similar to those in other professional or managerial jobs in the UK. Worse psychological health was found in recent graduates, and those who worked long hours. Adjusted measures of psychological health were similar for males and females, although females experienced more anxiety and less contentment in relation to their jobs than males. Professional bodies and veterinary schools may wish to consider the merits of providing training in dealing with work-related distress, anxiety and depression to improve the psychological well-being of veterinarians, and possibly reduce the attrition from the profession.

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