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Benefits of practice ownership among US private practice veterinarians extend to professional quality of life

Frederic B. Ouedraogo, PhD[1]*, and Sandra L. Lefebvre, DVM, PhD[2]

[1]Veterinary Economics Division, AVMA, Schaumburg, IL
[2]Marketing & Communications Division, AVMA, Schaumburg, IL

*Corresponding author: Dr. Ouedraogo (fouedraogo@avma.org)

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OBJECTIVE
To estimate the effects of practice ownership on wellbeing of US private practice veterinarians.

SAMPLE
1,217 practice owners and 1,414 associate veterinarians (ie, nonowners) who participated in the 2021 AVMA Census of Veterinarians and Practice Owners Survey.

PROCEDURES
A professional quality of life instrument was used to measure compassion satisfaction (CS; a positive attribute), burnout (BO), and secondary traumatic stress (STS) in practice owners and nonowners both as scores and as score categories (low, moderate, and high CS, BO, and STS). For hypothesis tests, propensity score matching was used, with owners (n = 595) matched to nonowners (595) on several demographic and employment factors.

RESULTS
Owners had significantly (P < .001) higher CS scores (mean ± SE, 34.1 ± 0.3) and lower BO scores (26.1 ± 0.3) than nonowners (32.8 ± 0.3 and 26.9 ± 0.3, respectively), but STS scores were comparable between groups (27.4 ± 0.3 and 27.5 ± 0.3; P = .55). The prevalence of low CS scores and high BO scores was significantly (P < .001) higher for nonowners versus owners (53.8% vs 42.7% and 51.6% vs 46.4%, respectively). Both owners and nonowners had a high prevalence of high STS scores (81.8% and 83.2%, respectively; P = .53).

CLINICAL RELEVANCE
Results suggested that practice ownership confers a benefit to private practice veterinarians in terms of CS and BO, but not STS. The prevalence of poor CS, BO, and STS scores was higher than reported previously for 2016 to 2018, suggesting an impact of the COVID-19 pandemic. The high prevalence of high STS scores in both groups warrants attention and action to protect the welfare of the veterinary workforce and support optimal patient care.

Studies[1–10] have repeatedly documented mental health challenges such as depression, anxiety, stress, and burnout (BO) among veterinarians, including higher suicide rates than in the general population. The wellbeing of the veterinarian workforce, more than 90% of whom are private practice veterinarians in the US,[11] is important to producing and delivering high-quality animal health-care services to animal owners. Poor professional quality of life could lead to lower productivities and higher inefficiencies in providing this care.[12] Veterinarians who feel burned out and are seeking a new work-life rhythm may shift to part-time work, seek a position that allows more autonomy or control over their workload or environment, or leave the profession altogether.

Although there may be no difference in technical skills between practice-owning veterinarians and the nonspecialist associate veterinarians in their employ, practice owners enjoy financial rewards that rival those of board-certified veterinarians.[13,14] Practice owners also have more control over their work environment than their employees.[15] One might assume, therefore, that practice owners have a higher wellbeing, on average, than associate veterinarians do, and that practice ownership would consequently be desirable.

The aim of this study was to estimate whether practice ownership confers mental health benefits by measuring 3 elements of professional quality of life—compassion satisfaction (CS), BO, and secondary traumatic stress (STS)—in practice-owning veterinarians (owners) and associate veterinarians (nonowners) in the US. We hypothesized that owners would have higher CS, lower BO, and lower STS scores than nonowners, controlling for other factors. We also hypothesized that owners would have a lower prevalence of CS scores in the low range and BO and STS scores in the high range, compared with nonowners.

Materials and Methods

Data source and study population

Data used for this study were obtained from the AVMA 2021 Census of Veterinarians and Practice Owners Survey, which was designed and administered by the AVMA Veterinary Economics Division. A random sample of 29,879 active US veterinarians was extracted from the AVMA membership database. Each selected veterinarian was emailed a link to the Qualtrics-based survey. The survey was distributed on March 26, 2021, and stayed open through April 30, 2021. Four follow-up emails were sent to invited individuals each week to encourage completion and submission of the survey. Participation was voluntary, and the only incentive was a discounted rate on registration for the 2021 AVMA Veterinary Business and Economics Forum, which was provided to randomly selected individuals who completed and submitted the survey.

Respondents were asked to select the type of position they were occupying at the time of survey completion. Answer options included associate veterinarian (employee), practice owner, relief or contract veterinarian, hospital director, consultant, and any other type not listed. Only veterinarians who identified themselves as practice owners and associate veterinarians were included in the analysis. Submitted surveys were reviewed for completeness, and respondents who were missing values on the variables used in the analyses were excluded.

Data

Survey data used in the study included demographic information, education and employment-related information, amount of student loan debt, self-reported health status, and responses to a professional quality of life instrument (ProQOL5).[16] For self-reported health status, respondents were asked, "In general, would you say your health is poor, fair, neutral, very good, or excellent?" To simplify these responses, the 5 categories were subsequently reclassified as poor, neutral, or good.

The ProQOL5 (https://proqol.org/proqol-measure) was used with the permission of the ProQOL group. This 30-item, self-report instrument was designed to score CS, BO, and STS in professional caregivers (helpers) and is described in detail elsewhere.[16] CS is a desirable attribute, defined as the pleasure that professional caregivers derive from being able to help their patients.[16] On the other hand, BO and STS are undesirable and together reflect compassion fatigue. BO refers to "feelings of hopelessness and difficulties in dealing with work or in doing your job effectively."[16] STS is described as "a negative feeling driven by fear and work-related trauma,"[16] which might occur, for example, when caring for and euthanizing suffering animals and comforting their owners.

Each item in the ProQOL5 is measured on a 5-point scale representing the frequency with which various situations or feelings were experienced in the past 30 days (1 = never and 5 = very often). This instrument is not intended to be used as a diagnostic test but can be used to "raise issues to address."[16] Responses regarding each of the 3 elements were analyzed both as scores and as score categories. Score categories were created as suggested by De La Rosa et al.[17] Specifically, for CS, a score < 34 was classified as low CS, a score between 34 and 41 as moderate CS, and a score ≥ 42 as high CS. For BO, a score < 20 was classified as low BO, a score between 20 and 26 as moderate BO, and a score ≥ 27 as high BO. Finally, for STS, a score < 14 was considered low STS, a score between 14 and 20 as moderate STS, and a score ≥ 21 as high CS.

Statistical analysis

Continuous data such as ProQOL scores were confirmed to be normally distributed by use of the Shapiro-Wilk and Kolmogorov-Smirnov tests. Results of subsequent statistical tests are summarized as mean ± SE.

Mean comparisons—Multivariate ANOVA was used to determine whether, within the owner or nonowner group, mean scores differed significantly with respect to demographic and employment-related factors (eg, difference in mean between female owners and male owners), controlling for other factors. A second ANOVA was performed to investigate the difference between the 2 groups at a certain level of demographic or employment-related factors (eg, difference in mean between female owners and female nonowners). The Student *t* test was used to perform an initial comparison of mean CS, BO, and STS scores between owners and nonowners.

Null hypotheses for subsequent analyses—Two sets of null hypotheses were tested for each of the 3 components of the ProQOL5. The primary set was that there is no difference between owners and nonowners in mean CS, BO, and STS scores. The secondary set was that there is no difference between the 2 groups in the prevalence of low CS, high BO, and high STS scores.

Propensity score matching and analyses—To test these 6 null hypotheses, the propensity score-matching approach was used. This approach was chosen over the traditional means analysis approach because propensity score matching can minimize the selection bias common to observational studies such as this one by simulating an experimental design. For example, according to the AVMA 2020 membership database, a typical practice-owning veterinarian in the US is a man (57.9%) who was born in or before 1969 (78.0%) and graduated from veterinary college before 1990 (52.7%). However, the majority of recent graduates are female nonpractice owners with relatively lower earnings than older generations, which are all variables shown or presumed to be associated with higher BO and STS scores.[10] Propensity score matching allows a more realistic and accurate comparison by matching owners to nonowners with respect to some selected characteristics that both parties have in common, thereby leaving the treatment (here, ownership or nonownership) as

the only observable difference between groups.[18,19] This approach is akin to the matched case-control approach, whereby cases are selected on the basis of the main characteristic of interest (practice ownership) and then matched to controls without that characteristic (nonownership) by 1 or more known confounders (eg, age category and gender).[20]

Logistic regression was first used to generate the propensity scores for respondents based on their likelihood of being a practice owner. A binomial logit model with a dichotomous response variable (practice owner or nonowner) was estimated. Included as covariates were the following variables previously found to be associated with CS, BO, and STS in veterinarians and other animal caregivers[10,21,22]: gender (male or female), race (white vs nonwhite), number of years since DVM graduation (< 10, 10 to 24, or > 24), marital status (married, single, or other), amount of educational debt on DVM graduation (categorized as $0, $1 to $99,999, and ≥ $100,000 to simplify modeling), and type of practice (food animal exclusive, mixed animal, companion animal predominant, companion animal exclusive, or equine). Type of community where the respondent lives (rural, urban, or suburban) was also included. Race was categorized as white or nonwhite (vs more specific categories) because of the low numbers of respondents selecting categories other than "white."

After propensity scores were obtained for each respondent, the so-called greedy nearest neighbor approach was used to match each practice owner to a nonowner.[23] This method consisted of pairing each practice owner with the nonowner who had shared the greatest similarities in demographic and employment-related characteristics. For this process, a one-to-many model or matching with replacement model was adopted, which allowed the same nonowner to be matched to more than 1 owner.

In addition to the confounding variables used in the logistic regression analysis, hours worked per week (categorized as < 30 h/wk, 30 to 60 h/wk, and > 60 h/wk) was added as a control variable hypothesized a priori to have a significant impact on CS and BO scores. Three other dichotomous variables were also added: whether (yes or no) respondents had at least 1 child between 0 and 4 years old, 5 and 12 years old, and 13 and 17 years old. Income was not included because of the potential that it could both predict wellbeing and be influenced by wellbeing.

Causal effects on practice ownership (vs nonownership) were estimated using an average treatment effect (ATE) approach. In such an approach, subjects in observational studies such as the present study are categorized into 2 groups: a treatment group (here, practice owners) and a control group (here, associate veterinarians or nonowners). After controlling for other sources of heterogeneity between the 2 groups, the ATE on CS, BO, and STS was estimated using the direct comparison between the 2 populations in which the only difference that remained was the hypothetical treatment (ie, practice ownership).

Statistical software (SAS version 9.4; SAS Institute Inc) and the logistic procedure (PROC LOGISTIC; SAS Institute Inc) were used to estimate the propensity scores following the seminal method developed by Rosenbaum and Rubin.[24] The PSMATCH procedure was used for the matching and the GENMOD and CAUSALTRT procedures were used to estimate the effect of ownership on the prevalence of low CS, high BO, and high STS scores as well as the difference in mean scores between the 2 groups. All tests were 2-tailed, and values of $P < .05$ were considered significant.

Results

Respondents

In total, 6,447 of 29,879 (21.6%) invited active veterinarians returned at least a partially completed survey. Of the 6,447 surveys submitted, 1,726 (26.8%; 5.8% of all invited individuals) were incomplete and were excluded during the first iteration of the data-cleaning process. The remaining 4,721 surveys were screened for missing data concerning the preidentified key variables and excluded from the study sample if data on at least 20% of those variables were missing. The final sample consisted of 2,631 respondents who identified themselves as practice owners (n = 1,217 [46.3%]) or associate veterinarians (1,414 [53.7%]), representing 8.8% (2,631/29,879) of potential participants. For analyses involving propensity score matching, 595 practice owners matched to an equal number of associate veterinarians (referred to subsequently as nonowners) were used.

The distribution of respondents with various characteristics was tabulated for all respondents overall **(Table 1)**. Notably, women represented 65.3% of the overall sample and men represented 34.7%. Overall, 67.3% of men were practice owners, compared with 35.1% for women. The most common category for years of experience (ie, years since DVM graduation) for nonowners was < 10 years (49.6% [702/1,414]) and for owners was > 24 years (65.3% [795/1,217]). Compared with nonowners, a higher percentage of owners were white (90.9% [1,286/1,414] vs 94.4% [1.149/1,217], respectively) and married (70.0% [989/1,414] vs 82.0% [998/1,217]). On the other hand, approximately equal percentages of nonowners and owners had children (41.9% [593/1,414] vs 39.6% [482/1,217], respectively). The percentage of respondents who lived in rural communities was higher for practice owners (44.2% [538/1,217]) than for associate veterinarians (23.3% [330/1,414]).

Companion animal–exclusive practice was the most common practice type for both groups overall (74.1% [1,048/1,414] vs 62.2% [758/1,217], respectively). The most common category for amount of education debt at graduation was ≥ $100,000 for nonowners (53.0% [750/1,414]) and $1 to $99,999 for owners (54.4% [662/1,217]). A greater percentage of nonowners worked 30 to 60 h/wk (78.9% [1,116/1,414]) than did owners (65.2% [794/1,217]). Finally, 9.1% (155/1,414) of nonowners reported their health status to be poor, compared with 8.4% (102/1,217) of owners.

Table 1—Number of US practice owners and associate veterinarians (nonowners) with various characteristics in 2021, summarized before and after matching of respondents by propensity scores.

	Before matching			After matching		
Characteristic	**Owner (n = 1,217)**	**Nonowner (n = 1,414)**	**Total (n = 2,631)**	**Owner (n = 595)**	**Nonowner (n = 595)**	**Total (n = 1,190)**
Gender						
Female	602 (35.1)	1,115 (64.9)	**1,717 (65.3)**	391 (50.0)	391 (50.0)	**782 (65.7)**
Male	615 (67.3)	299 (32.7)	**914 (34.7)**	204 (50.0)	204 (50.0)	**408 (34.3)**
No. of years since DVM graduation						
< 10	79 (10.1)	702 (89.9)	**781 (29.7)**	67 (43.0)	89 (57.0)	**156 (13.1)**
10–24	343 (42.2)	469 (57.8)	**812 (30.9)**	218 (43.8)	280 (56.2)	**498 (41.9)**
> 24	795 (76.6)	243 (23.4)	**1,038 (39.4)**	310 (57.8)	226 (42.2)	**536 (45.0)**
Race						
Nonwhite	68 (34.7)	128 (65.3)	**196 (7.4)**	34 (43.0)	45 (57.0)	**79 (6.6)**
White	1,149 (47.2)	1,286 (52.8)	**2,435 (92.6)**	561 (50.5)	550 (49.5)	**1,111 (93.4)**
Marital status						
Married	998 (50.2)	989 (49.7)	**1,987 (75.5)**	468 (50.1)	466 (49.9)	**934 (78.5)**
Single	78 (18.9)	335 (81.1)	**413 (15.7)**	48 (40.3)	71 (59.7)	**119 (10.0)**
Other*	141 (61.0)	90 (39.0)	**231 (8.8)**	79 (57.7)	58 (42.3)	**137 (11.5)**
At least 1 child						
0–4 y old	72 (24.2)	226 (75.8)	**298 (11.3)**	54 (40.3)	80 (59.7)	**134 (11.3)**
5–12 y old	191 (45.2)	232 (54.8)	**423 (16.1)**	116 (42.8)	155 (57.2)	**271 (22.8)**
13–17 y old	219 (61.9)	135 (38.1)	**354 (13.4)**	117 (51.1)	112 (48.9)	**229 (19.2)**
Educational debt at graduation ($)						
0	338 (56.2)	263 (43.7)	**601 (22.8)**	133 (50.0)	133 (50.0)	**266 (22.4)**
1–99,999	662 (62.3)	401 (37.7)	**1,063 (40.4)**	307 (52.7)	275 (47.3)	**582 (48.9)**
≥ 100,000	217 (22.4)	750 (77.6)	**967 (36.7)**	155 (45.3)	187 (54.7)	**342 (28.7)**
Practice type						
FAE	32 (66.7)	16 (33.3)	**48 (1.8)**	10 (50.0)	10 (50.0)	**20 (1.7)**
MIX	121 (55.3)	98 (44.7)	**219 (8.3)**	45 (50.0)	45 (50.0)	**90 (7.6)**
CAP	212 (51.1)	203 (48.9)	**415 (15.8)**	77 (50.0)	77 (50.0)	**154 (12.9)**
CAE	758 (42.0)	1,048 (58.0)	**1,806 (68.6)**	444 (50.0)	444 (50.0)	**888 (74.6)**
Equine	94 (65.7)	49 (34.3)	**143 (5.4)**	19 (50.0)	19 (50.0)	**38 (3.2)**
Hours worked per week						
< 30	47 (25.5)	137 (74.5)	**184 (7.0)**	39 (39.0)	39 (39.0)	**100 (8.4)**
30–60	794 (41.6)	1,116 (58.4)	**1,910 (72.6)**	426 (49.4)	426 (49.4)	**862 (72.4)**
> 60	376 (70.0)	161 (30.0)	**537 (20.4)**	130 (57.0)	130 (57.0)	**228 (19.2)**
Self-reported health condition						
Poor	102 (39.7)	155 (60.3)	**257 (9.8)**	56 (50.5)	55 (49.5)	**111 (9.3)**
Neutral	205 (43.0)	272 (57.0)	**477 (18.1)**	107 (48.9)	112 (51.1)	**219 (18.4)**
Good	910 (48.0)	987 (52.0)	**1,897 (72.1)**	432 (50.2)	428 (49.8)	**860 (72.3)**
Community of residency						
Rural	538 (62.0)	330 (38.0)	**868 (33.0)**	199 (50.0)	199 (50.0)	**398 (33.5)**
Urban	121 (33.9)	236 (66.1)	**357 (13.6)**	63 (50.0)	63 (50.0)	**126 (10.5)**
Suburban	558 (39.7)	848 (60.3)	**1,406 (53.4)**	333 (50.0)	333 (50.0)	**666 (56.0)**

Values in parentheses within columns for owners and nonowners represent the percentage of all respondents (owners plus nonowners) with the indicated characteristic to show the effectiveness of matching (aim: 50–50 split between owners and nonowners). Values within columns for totals represent the overall percentage of all respondents.

*Other = Separated, divorced, or widowed.

CAE = Companion animal exclusive. CAP = Companion animal predominant. FAE = Food animal exclusive. MIX = Mixed animal.

Unmatched analyses

Mean ProQOL scores—Overall, practice owners had significantly (Student *t* test; $P < .001$) higher CS scores (mean ± SE, 34.8 ± 0.2), lower BO scores (25.1 ± 0.2), and lower STS scores (26.4 ± 0.2) than did nonowners (31.6 ± 0.2, 28.5 ± 0.2, and 28.8 ± 0.2, respectively). Women had significantly ($P < .01$) lower mean CS, higher BO, and higher STS scores than did men, regardless of ownership status **(Supplementary Table S1)**. Other variables associated with lower CS scores and higher BO and STS scores in 1 or both groups included fewer years of experience, higher educational debt, higher mean hours worked per week, and having children in certain age groups (0 to 4 years, higher BO and STS in owners; 5 to 12 years, lower CS and higher BO and STS in owners; 13 to 17 years, higher BO in nonowners). Self-reported good (vs bad) health was associated with higher CS scores and lower BO and STS scores in both groups. No association was found for race, with white and nonwhite respondents having similar scores for all 3 measures.

In comparisons between owners and nonowners, male and female owners had significantly ($P < .01$) higher mean (± SE) CS scores of 35.3 ± 0.3 and 34.3 ± 0.3, respectively, compared with 33.3 ± 0.4 and 31.1 ± 0.2, respectively, for nonowners. With respect to BO, male and female owners had significantly ($P < .01$) lower mean scores (23.6 ± 0.3 and 26.6 ± 0.3, respectively) than did nonowners (26.0 ± 0.4 and 29.1 ± 0.2, respectively). Similar differences between the 2 groups were noted for STS scores (Supplementary Table S1).

Higher levels of educational debt were associated with lower CS scores, higher BO scores, and higher STS scores. Practice owners who graduated with zero educational debt had a mean CS score of 36.1 ± 0.3, compared with 34.6 ± 0.2 for those with educational debt between $1 and $99,999 and 33.5 ± 0.4 for those with debt ≥ $100,000. Within each

debt-level category, owners had higher CS scores and lower BO and STS mean than nonowners, except in the comparison of STS scores between owners and nonowners with debt ≥ $100,000.

Mean CS scores for practice owners and nonowners ranged from 34.4 to 35.5 and from 30.7 to 33.1, respectively, depending on practice type, and did not differ significantly among practice types. However, owners in mixed animal, companion animal–predominant, companion animal–exclusive, and equine practice had significantly higher BO and STS scores than their nonowner counterparts. Within the owner group, those in food animal–exclusive practice had the lowest mean BO score (22.0 ± 1.2) and those in companion animal–exclusive practice had the highest (25.4 ± 0.3). With respect to STS, owners in food animal–exclusive practice had a lower mean score (22.5 ± 1.2) than did owners of other types of practices (at least 26.0 ± 0.7). Within the nonowner group, the only significant difference found was for STS in food animal–exclusive practice, which scored significantly lower (mean ± SE, 24.8 ± 1.7) than nonowners in other practice types (at least 28.5 ± 0.7).

Concerning the community of residence, various differences in mean scores among types of communities (rural, urban, or suburban) were found within the owner and nonowner groups, with no clear advantage of any 1 community type (Supplementary Table S1). Scores differed significantly between owners and nonowners within all community types, with owners having higher CS and lower BO and STS scores. In terms of self-reported health status (poor, neutral, or good), owners had significantly higher mean CS scores and significantly lower mean BO and STS scores at all levels than did nonowners. Within both the owner and nonowner groups, as health status improved, mean scores for CS increased significantly and mean scores for BO and STS decreased significantly.

Prevalence of ProQOL scores—The prevalence of low CS scores among practice owners was 38.8% (472/1,217), which was significantly lower than the prevalence among nonowners (60.3% [853/1,414]). The prevalence of high BO scores was also significantly lower among owners (41.6% [506/1,217) versus nonowners (61.7% [872/1,414). Between the 2 groups, the gap was narrowest and the prevalence highest for high STS scores, represented by 80.1% (975/1,217) of owners and 87.6% (1,239/1,414) of nonowners.

Matched analysis

Effect of ownership on mean ProQOL scores—Characteristics of the 595 owners and their matched nonowner counterparts were summarized (Table 1). The ATE analysis, which involved controlling for potential confounding variables to estimate the effect of ownership on ProQOL measures, revealed that nonowners had a significantly lower mean CS score (32.8 ± 0.3) and higher mean BO score (26.9 ± 0.3) than did practice owners (34.1 ± 0.3 and 26.1 ± 0.3, respectively; $P < .001$ for both comparisons). These results suggested that, compared with nonownership, ownership on average increases CS by 1.19 points and decreases BO by 0.77 points. Again, no significant ($P = .55$) effect of ownership on STS scores was found (mean difference between groups, 0.23), suggesting that practice owners (mean score, 27.4 ± 0.3) and nonowners (27.5 ± 0.3) had similar levels of STS.

Effect of ownership on the prevalence of ProQOL scores—Practice owners were significantly ($P < .001$) less likely than their nonowner counterparts to have a low CS score (prevalence, 42.7% [254/595] and 53.8% [320/595], respectively) and less likely to have a high BO score (prevalence, 46.4% [276/595] and 51.6% [307/595]). However, the 2 groups were statistically comparable in the risk of a high STS score (81.8% [487/595] and 83.2% [495/595], respectively; $P = .53$).

Discussion

The present study revealed some interesting, and often disconcerting, data on the wellbeing of US veterinarians in private practice in 2021. Although STS scores did not differ significantly between practice-owning veterinarians and associate veterinarians after propensity score matching, CS scores were statistically higher and BO scores statistically lower among owners, supporting 2 of our 3 primary hypotheses. The prevalence of low CS scores and high BO scores—both undesirable traits—was also lower among practice owners, supporting 2 of our 3 secondary hypotheses. Both sets of findings suggested a beneficial effect of practice ownership on veterinarian wellbeing.

Insights into wellbeing were not limited to practice owners. After propensity score matching, mean CS scores for both veterinarian groups were either at the precipice of being considered low (ie, < 34; mean score for practice owners, 34.1) or were within the low range (32.8 for nonowners). Mean BO scores for both groups were near the cutoff used to designate a high score (ie, ≥ 27; mean score for owners and nonowners, 26.1 and 26.9, respectively). But perhaps most noteworthy was that mean STS scores for both groups were in the high range (ie, ≥ 21; 27.4 and 27.5, respectively), with 8 of 10 practice owners and associate veterinarians having high STS scores. This high prevalence is noteworthy, particularly considering that from 2016 to 2018, the prevalence of high STS scores among the general full-time US veterinarian population was 58.9% (or 6/10 veterinarians).[10] The prevalence of high BO and low CS scores was also higher for the veterinarians of the present study versus just a few years earlier, particularly among associate veterinarians (low CS, 60.3% vs 35.5% for all veterinarians in the previous study[10]; high BO, 61.7% vs 50.2%, respectively). These findings are supported by the results of the third Merck Animal Health Veterinarian Wellbeing Study,[25] also conducted in 2021. That study[25] showed an increase in the percentage of veterinarians with a low level of wellbeing, from 9.4% in 2019 to 12.3% in 2021, and a high prevalence of BO (30.5%) as measured by the Mayo Clinic Physicians Wellbeing Index. The study[25] also found an increase in the prevalence of serious psychological distress (measured with the Kessler Psychological Distress Scale), from 6.4% in 2019 to 9.7% in 2021.

An obvious explanation for the increased prevalence of poor ProQOL scores is the COVID-19 pandemic. Attempts to control spread of the SARS-CoV-2 virus challenged veterinary teams to, among other things, develop and implement new workflows and operating procedures—all in the presence of uncertainty, greater demand for services, drug shortages, staffing shortages, and higher staff turnover.[26] Practice demands, such as long hours or work overload, are the most common source of occupational stress for veterinarians.[27] In terms of professional quality of life, CS involves not only feeling satisfied by one's job but also the ability to keep up with new technologies and protocols.[17] On the other hand, BO can include feeling overwhelmed or bogged down and disconnected from the person one aspires to be, whereas STS can involve feeling overwhelmed and exhausted by the trauma of others one has helped, including patients and clients, and an inability to separate one's private life from that helper role. Stamm,[16] the creator of the ProQOL5, notes that feelings of high STS only rarely lead to problems. But when high STS is combined with high BO and low CS, this can lead to feelings of uselessness and overwhelm in the workplace. Stamm[16] recommends that people "are probably helped most by being removed from their current work setting" and suggests they be assessed for PTSD and depression and that the workplace be examined. Whether the effects of the pandemic continue to tax professional quality of life among veterinarians as people and businesses further adapt to a new normal remains to be seen.

Some findings of the unmatched analyses in the present study also merit mention. Being female, having less experience, having higher educational debt, and working more hours per week were generally associated with poorer ProQOL scores, whether among practice owners or associate veterinarians. Similar associations of these factors with measures of wellbeing have been repeatedly demonstrated in veterinarians and other health-care professionals.[1,4,10,21,28–30] Educational debt and hours worked per week are both changeable factors that could be targeted to improve wellbeing. In the context of mental health, high educational debt and proposed solutions have been discussed in other reports,[10,30] but hours worked has received less attention. It may be presumed that practice owners work fewer hours per week than associate veterinarians do, yet the opposite was found in the present study (30.9% of owners worked > 60 h/wk, compared with 11.4% of nonowners; Table 1). Data from the UK support this observation.[31] It was interesting to note that practice owners had better ProQOL scores than associate veterinarians at all levels of hours worked. These differences might have reflected more direct rewards to working those hours, more control over the situation (eg, more choice in when to work), or less time spent doing clinical work. The association between longer hours worked and higher BO scores in both groups was supported by other research, whereby fatigue and longer hours were among reasons cited for veterinarians leaving clinical practice.[32]

Another interesting finding of the unmatched analyses was that practice-owning veterinarians in companion animal–exclusive practice had the highest mean BO score, and those in food animal–exclusive practice had both the lowest mean BO score and lowest mean STS score, controlling for other factors. Among nonowners, the only statistically significant difference among practice types was in food animal–exclusive practice, where the mean STS score was lowest. These results are supported by previous research by our group,[10] which found lower BO and STS scores in veterinarians who spent < 25% (vs more) of their time working with dogs and cats. Other research reveals that the prevalence of food animal veterinarians classified as "suffering" in 2021 is almost half that of companion animal veterinarians (7% vs 13%).[25] The reason for this seeming advantage of food animal practice over companion animal practice is likely multifactorial. Possible explanations include differences between the 2 in various characteristics, including but not limited to the following: the nature of the relationships between clients and their animals; typical workloads, activities, and lifestyles; and types and extents of occupational disruptions caused by the pandemic.

The unmatched analyses also showed that, in some instances (and mostly for practice owners), having children within certain age groups was associated with poorer ProQOL scores. To the authors' knowledge, this is the first study to show such a connection. Previous studies involving veterinarians have demonstrated the opposite—that having children is associated with better ProQOL scores,[10] greater resilience,[21] and less anxiety and depression.[33] Possible explanations for the difference between studies are the lack of daycare services and the need for remote schooling during the pandemic, which added additional stress to life both at home and at work.

Overall, results of the present study have important implications for patients, veterinarians, and the veterinary profession or workforce as a whole. Struggles with wellbeing among veterinarians have the potential to threaten the delivery of optimal patient care. In surveys of physicians, higher BO and sleep-related impairment were associated with an increased odds of self-reported medical errors.[34–36] And the situation appears to compound itself, as certain types of medical errors have been found to be associated with short-term adverse impacts on the professional lives of veterinarians, which can affect their confidence,[37] thereby affecting patient care. In terms of clients, the impact of veterinarian wellbeing on the client experience, and specifically on client satisfaction, appears to be more complex, with no connection found between low client satisfaction scores and low CS or high BO or STS score.[38]

Turning to veterinarians, the findings reported here suggested that their mental health is being challenged and the pandemic seems to have, at least temporarily, exacerbated the situation. Practice ownership may protect slightly in this regard, but is no panacea. It is important to emphasize 2 things here. First, this problem is not unique to veterinarians. The WHO estimates that the prevalence of anxiety and depression increased worldwide by 25% during the first year of the COVID-19 pandemic.[39] Second, professional quality of life is a complex construct, influenced by characteristics of the individuals themselves, characteristics of their workplace (at the organization and task level), and their exposure to direct or indirect trauma in that workplace.[17] Consequently, a multifactorial approach is required to support optimal

wellbeing at the individual, practice, and profession level. Many veterinary organizations have taken this problem seriously and made substantial efforts to develop and provide resources to help veterinarians and other veterinary professionals combat and prevent stress, BO, and other threats to wellbeing at the individual and workplace level. Examples of such resources include online toolkits from the AVMA (www.avma.org/resources-tools/wellbeing) and Merck Animal Health (https://www.merck-animal-health-usa.com/about-us/veterinary-wellbeing-study), the AVMA's Workplace Wellbeing Certificate Program (axon.avma.org/local/catalog/view/product.php?productid=22), and the American Animal Hospital Association's culture initiative (https://www.aaha.org/culture).

Even so, use of self-care resources by veterinarians has historically been low, with only 12% of respondents in a 2019 survey—and only 16% of respondents with serious psychological distress—having accessed such resources.[30] It is actually hospital-wide interventions such as those that address workplace culture that show the greatest promise for improving individual wellbeing. Efforts to make workflows more efficient (eg, by delegating certain tasks to credentialed veterinary technicians), decrease time pressure (eg, by extending visit durations by 5 minutes), improve communications among staff (eg, by holding regular meetings to discuss personal or work challenges), address clinician concerns, and provide strong leadership (eg, through coaching and recognition) have shown promise in reducing BO and improving job satisfaction in human health-care organizations.[36,40] In 2021, only 61% of surveyed veterinary practices employed credentialled veterinary technicians.[16] As we emerge from the disruptive effects of the pandemic on working conditions and work-life balance, other cultural changes might include increased hiring of and greater reliance on certified veterinary technicians, setting limits on the number of hours worked per week, encouraging veterinarians and other staff to take vacations or personal days, and celebrating successes, such as continuing to provide quality patient care despite the challenges of the past 2 years.

At the profession level, it is important to consider the overall effect of high BO and STS on wellbeing of the workforce. For example, Neill et al[41] estimate that BO among veterinarians is costing veterinary medicine approximately $1 to $2 billion in lost revenue each year. We believe that, with their training, experience, and problem-solving abilities, the veterinary profession is uniquely capable of solving in meaningful way these challenges to wellbeing. For the profession to continue to thrive, it needs to continue to identify and advise on workplace characteristics that promote wellbeing, to push for loan forgiveness programs, and to advocate in other ways for its members. Veterinary colleges can encourage practice ownership by providing graduates with the skills to run a business. The federal government, through student debt management programs and entrepreneurial initiatives, can also incentivize new graduates to embrace ownership paths.

The present study had a few limitations that warrant consideration when interpreting the findings. First, the observed differences in mean ProQOL scores, although statistically significant, were in many cases relatively small (ie, < 3 points). To the authors' knowledge, no studies have demonstrated the cutoff that constitutes a meaningful difference in ProQOL scores in terms of quality of life at the individual or population level. Readers are therefore encouraged to consider the mean score findings with this in mind. Second, although propensity score matching on demographic and employment-related factors was used to make the nonowner and owner groups as similar as possible in all factors other than ownership status, we were restricted to information available from the survey. Other variables such as personal and workplace factors have been shown to be associated with professional quality of life in veterinary professionals.[27]

Third, the survey from which the data were derived was not hypothesis driven. The ProQOL5, although designed specifically for caregivers, is but 1 metric to assess wellbeing or mental health. Use of other relevant psychological metrics such as the Maslach Burnout Inventory-Human Services Scale for Medical Personnel or Hospital Anxiety and Depression Scale (Snaith) would have strengthened the study and its conclusions. Further, use of a recently validated Burden Transfer Inventory instrument could have helped identify and control for any associations between stressful client behaviors or interactions and stress or BO among veterinarians,[42] allowing for a deeper understanding of the role that transfer of caregiver burden (from clients to veterinarians) plays in veterinarian wellbeing. Nevertheless, the broad scope of questions that the survey did include would have helped to minimize response bias, or the chance that respondents intentionally or unintentionally modified their responses to favor the perceived desirable answer. Finally, private practitioners who had low CS, high BO, or high STS might have been more likely than others to ignore the survey invitation or to incompletely respond—a type of nonresponse bias that could have led to underestimation of poor scores.

In conclusion, the present study found differences between practice-owning veterinarians and associate veterinarians in CS and BO, with owners having the advantage. The prevalence of poor scores was unsettling in both groups, particularly the prevalence of high STS scores, suggesting a universal problem requiring profession-wide solutions. These results are a call for veterinary leadership to continue to help and empower practicing veterinarians to manage and cope with BO and STS, strengthen their resilience, and nurture healthy work environments.

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Supplementary Materials

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