

Perceptions of gender bias among members of the American Association of Bovine Practitioners in bovine practice in the United States in 2018

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Abstract

The objective of this study was to gather perceptions of gender bias and the factors that influence gender bias in bovine veterinary practice. A web-based survey regarding perceptions related to gender bias encountered in clinical practice settings was made available electronically to the members of the American Association of Bovine Practitioners. There were 207 survey respondents (99 women and 108 men), and the population was closely split between those graduating in 2000 or before (48.8%) and those graduating in 2001 or after (51.2%). Survey responses about those experiencing client or employer-generated gender bias in their current practice, and in the first year of practice, were categorized to binary (yes/no) from ordinal responses (0-10 scales). Logistic models were utilized to analyze potential associations between perceptions of client or employer-generated gender bias with relevant respondent factors including gender, year of graduation (categorized as <1990, 1990-2000, 2001-2010, 2011-2017), pre-college community size (categorized as <1,000-5,000, 5,001-50,000, >50,000), post-college community size (categorized as <1,000-5,000, 5,001-50,000, >50,000), food animal background (yes/no), practice activities (categorized as Exclusively Beef/Dairy; Mixed Practice, mostly beef/dairy, Mixed Practice, no beef/dairy), and if the respondent was the first of their gender in the practice (yes/no). Women graduating before 1990 were less likely to observe current client gender bias than those graduating in 2011-2017. Men were more similar throughout with those graduating before 1990 seeing slightly less current client gender bias than those graduating in 2011-2017. Graduation year was associated with increased risk of client gender bias over time, with those graduating before 1990 experiencing less client gender bias in the first year of practice than those graduating in 2011-2017. Women observed more client gender bias in the first year of practice compared to men. There

were no significant associations with employer gender bias in their current practice, but employer gender bias in the first year of practice was found to be significantly associated with respondent gender. Men were roughly half as likely to observe employer gender bias in the first year of practice compared to women. Gender and graduation year were significantly associated with client and employer gender bias encountered in the current practice and in the first year of practice. The results support the conclusion that gender bias is encountered by our veterinary colleagues, with more bias perceived by more recently graduated women.

Key words: gender bias, veterinary practices, recent graduates

Introduction

The percentage of women employed in veterinary practice in the US exceeded 50% for the first time in 2009.¹⁶ Although some reports suggest that women and men have equal interest in food animal practice during veterinary school,^{3,9,11} after graduation men outnumber women in food animal practice, unlike small animal and equine practice. In 2019, in the US, the men/women percentage distributions for food animal exclusive, food animal predominant, and mixed animal private practice were 77.1/22.9, 74.3/25.7, and 56/44%, respectively.⁵ The ratio among AABP members in 2016 was 69/31.⁴

Reasons for the differences in gender composition among practice types are not clear. If the profession of bovine practice wishes to remain robust and successful, it is important to determine the factors that influence recruitment and retention, including those that are specifically related to gender. Gender differences are among the purported factors correlated with women's entry or retention in rural or food animal practice,^{15,17,18} although gender was not included in the list of major factors influencing retention and recruitment of

food animal veterinarians in another report.¹ Potential factors influencing recruitment and retention in practices with a food animal component include gender bias or discrimination and the gendered nature of food animal practice.

Gender bias (in general defined as the tendency to prefer one gender over another) has been recognized in veterinary medicine and related fields. In human medicine, there are many reports of gender bias and discrimination, with particularly egregious examples reported in medical schools and in surgical specialties.^{7,12,13} Animal and dairy scientists have reported perceptions of gender effects on hiring, salaries, and collaboration.⁸ Approximately 60% of women in agribusiness reported sexism or discrimination because of their gender in a 2019 survey.² Veterinarians report gender bias in small and large animal practice.⁶

More compelling perhaps than individuals' perception of bias was a controlled trial in 2018, which demonstrated that a fictitious veterinarian named "Mark" was consistently offered a higher salary than "Elizabeth" with the same resume by employers and managers in the UK who said they believed gender discrimination no longer exists, whereas the offered salaries were not different among the subjects who said they believed there is still gender discrimination. "Mark" was also perceived as more competent and therefore more likely to be offered managerial responsibilities.⁶ In addition, informal discussions within AABP have led to speculation about the extent and perception of gender bias among bovine practitioners because the published data in veterinary medicine are not specific to bovine practice. AABP leadership therefore decided to gather data about member perceptions and experiences.

Understanding the reasons for gender bias is necessary for the wellbeing of the industry. Unfortunately, there is little research currently available on gender bias in bovine or mixed animal practice from clients, employers, and personnel during the hiring process. Therefore, this study focused on elucidating the perceptions of gender bias and the factors that influence gender bias in the bovine veterinary practice. The specific objective was to determine potential associations between perceptions of client or employer-generated gender bias with relevant respondent factors including gender, year of graduation, pre-college community size, post-college community size, food animal background, practice activities, and if the respondent was the first of their gender in the practice. Additional thematic analysis of free-text responses is reported in a separate manuscript.¹⁰

Materials and Methods

Survey questions were developed with the goal of capturing perceptions about personal experiences in job seeking, hiring, and working as an associate or owner. Some questions were also modeled on institutional climate surveys and data in the literature on veterinary hiring. In the survey, the working definition of gender bias provided to respon-

dents was "when a member of one gender is advantaged or disadvantaged for the reason of their gender".

Sections of the survey included:

- 1) demographic queries such as year of graduation, practice type, and gender;
- 2) hiring experiences in the respondent's first and current job such as number of applications and interviews, barriers or disincentives to taking a job, reasons for taking or not taking a position, and reasons for leaving a position;
- 3) experiences as a veterinary practitioner of gender bias from employers, employees, clients or others on a scale from 0-10, with 0 being no gender bias perceived and 10 being constant and persistent;
- 4) experiences as an employer such as barriers to hiring, number of applicants for positions, and reasons veterinarians left.

The survey was piloted on a convenience sample of bovine practitioners, and minor revisions were made to available responses. An invitation from the AABP President at the time (MDA) for graduate veterinarians to participate in the survey was included in the monthly AABP newsletter (email and hard copy) and on the AABP listserv, and a follow-up notice was sent to the AABP listserv several weeks after the initial invitation. At the time of survey distribution in 2018, there were 4116 AABP members. The link to the survey in the invitation was to the AABP website member log-in page to prevent non-members from accessing the survey, but identification was stripped from the data prior to analysis to maintain anonymity. The survey was deemed exempt from review by the Institutional Review Board at Kansas State University.

Questionnaire responses were reviewed for completeness, and respondents with any incomplete responses for the specific variables being analyzed were removed from the dataset before modeling.

Survey responses about the perceived presence of gender bias from current clients, clients in the first year of practice, current employers, and employers in the first year were used as outcome variables in 4 different models. The survey responses on gender bias were categorized to binary (yes/no, with no=0 and yes=1-10) from ordinal responses (0-10 scales) for use in model prediction. The binary outcomes were derived from survey responses of zero as no gender bias and those marking any other response as experiencing gender bias; the model then predicted a probability of experiencing any level of gender bias for each of the survey response factors (independent variables) listed in Table 1.

Additional continuous outcomes of interest included number of applications submitted for the first position, number of interviews received for the first position, and a ratio of interviews to applications. Survey response factors from Table 1 as well as food animal background, practice activities, and whether the respondent was the first gender at the practice, were categorized and evaluated for potential

Table 1. Descriptive statistics of respondents of a survey of AABP members about perceptions and experiences of gender bias.

		No. (%)
Gender	Male	108 (52.2)
	Female	99 (47.8)
Graduation year	Prior to 1990	68 (32.9)
	1990-2000	33 (15.9)
	2001-2010	45 (21.7)
	2011-2017	61 (29.5)
Size of town pre-college	<1000-5,000	29 (14)
	5,001-50,000	98 (47.3)
	>50,000	80 (38.6)
Size of town post-DVM	<1000-5,000	29 (14)
	5,001-50,000	112 (54.1)
	>50,000	66 (31.9)

association with each outcome. A complete list of survey questions is available from the authors.

Data were imported into a statistical software package (R) for analysis. Univariate logistic models were created to determine potential associations between each factor (gender, year of graduation [categorized as <1990, 1990-2000, 2001-2010, 2011-2017], pre-college community size [categorized as <1,000-5,000, 5,001-50,000, >50,000], post-college community size [categorized as <1,000-5,000, 5,001-50,000, >50,000], food animal background [yes/no], practice activities [categorized as Exclusively Beef/Dairy; Mixed Practice, mostly beef/dairy, Mixed Practice, no beef/dairy], and if the respondent was the first of their gender in the practice [yes/no]) with each outcome of interest (perceived presence of gender bias from current clients, perceived presence of gender bias from clients in the first year of practice, perceived presence of gender bias from current employers, perceived presence of gender bias from employers in the first year of practice, number of interviews received for the first position, number of applications submitted for the first position, and the ratio of number of interviews to applications for the first position). Multivariable models (GLM package with binomial or gaussian link function based on outcome type) were created using factors identified as associated with the outcome variables with a significance level of $P < 0.10$. The final model for each outcome was generated using an iterative process (step procedure) to include only factors associated with each outcome at $P < 0.05$. Both Akaike Information Criterion and Bayesian Information Criterion were applied in the model selection process. Statistical results are listed as mean \pm standard error.

Results

A total of 207 survey respondents provided responses for the various factors being evaluated in the model, including 99 women and 108 men (Table 1). The population was closely split between those graduating in 2000 or before

(48.8%) and those graduating in 2001 or after (51.2%). Over half of the population (61.3%) reported coming from a location within 30 miles of a community size of 50,000 or less pre-college, and slightly more (68.1%) reported moving to a location within 30 miles of communities of 50,000 or less following graduation. Nearly all of the respondents (90.4%) noted working with mostly bovines in their practices and a similar percentage (81.2%) reported having a food animal background prior to attending veterinary school.

The perception of gender bias from current clients was categorized into no-bias and bias; 31.9% of respondents were placed into the no-bias category. A distribution of the ordinal data can be found in Figure 1. The binary variable of perceived bias from current clients was used as the outcome in the analysis and was significantly ($P = 0.04$) associated with graduation year and was modified by gender (Figure 2). Women showed a significant ($P < 0.05$) increase in likeli-

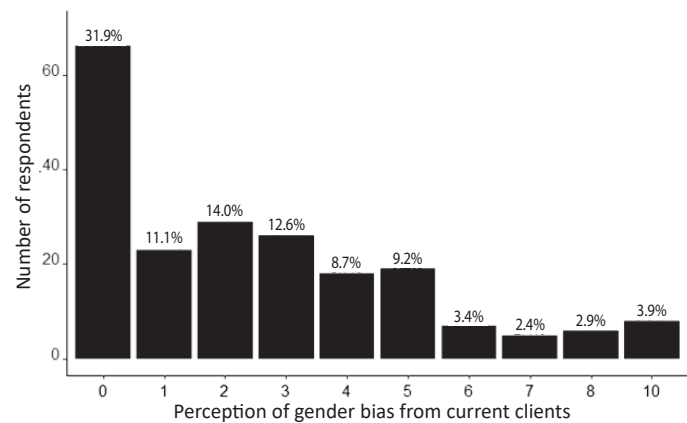


Figure 1. AABP members were surveyed to determine the perceived presence of gender bias from their current clients. Results are displayed on a scale of 0-10 with 0 being no gender bias perceived and 10 indicating constant, persistent gender bias.

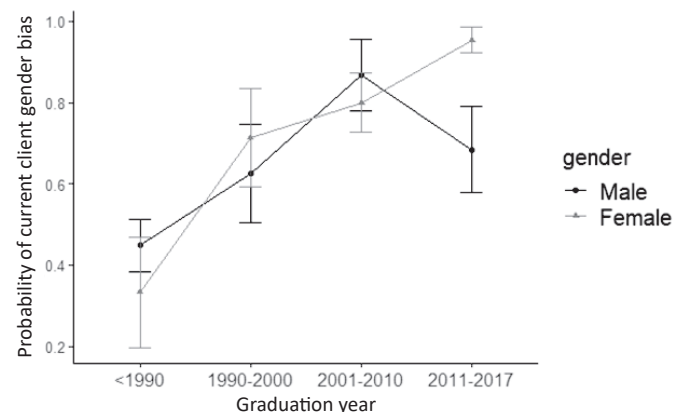


Figure 2. AABP members were surveyed to determine the perceived presence of gender bias from their clients in the first year of practice. This outcome was significantly associated with the interaction between graduation year and gender.

hood of observing gender bias from current clients based on graduation year: before 1990 (0.33 ± 0.14) as compared to 2011-2017 (0.95 ± 0.03). Men also saw an increase in the likelihood to observe gender bias from current clients from before 1990 (0.45 ± 0.07) to 2001-2010 (0.87 ± 0.09), but then experienced a decline in 2011-2017 (0.68 ± 0.11). It is important to note that respondents were asked to identify whether they perceived the presence of gender bias, and not if they had personally experienced gender bias.

The perception of gender bias from clients in the first year of practice was also categorized into bias and no-bias; 27.5% of respondents were placed into the no-bias perceived category. A breakdown of the ordinal data can be found in Figure 3. Regarding the perception of gender bias from clients in the first year of practice, graduation year and gender were both significantly ($P = 0.04$ and $P < 0.01$, respectively) associated, but no significant interaction was identified between the 2 variables. Graduation year increased the risk of gender bias in the first year of practice over time, with those graduating before 1990 (0.70 ± 0.07) reporting less client gender bias in the first year of practice than those graduating in 2011-2017 (0.87 ± 0.05). Women also indicated noticing more gender bias from clients in the first year of practice (0.95 ± 0.02) compared to men (0.60 ± 0.06).

There were no significant associations observed between any of the variables and the perception of gender bias from employers in their current practice. This outcome placed the largest percentage of respondents (60.9%) into the no bias observed category. A summary of the ordinal data can be found in Figure 4.

The perceived presence of gender bias from employers in the first year of practice was found to be significantly ($P < 0.01$) associated with gender. Men were approximately half as likely (0.31 ± 0.04) to observe gender bias from employers in the first year of practice compared to women (0.65 ± 0.05). Gender bias from employers in the first year of practice was

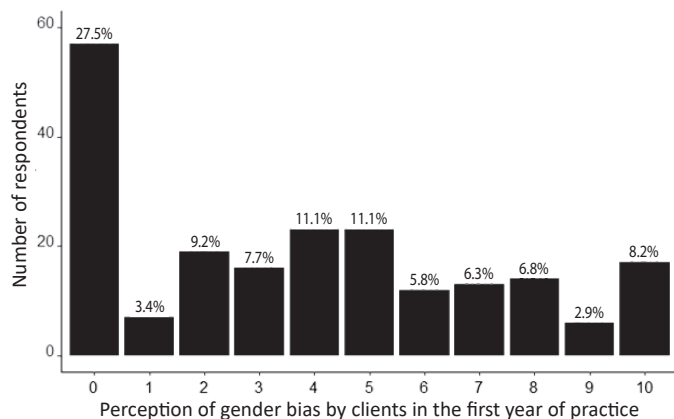


Figure 3. AABP members were surveyed to determine the perceived presence of gender bias from their clients in the first year of practice. Results are displayed on a scale of 0-10 with 0 being no gender bias perceived and 10 indicating constant, persistent gender bias.

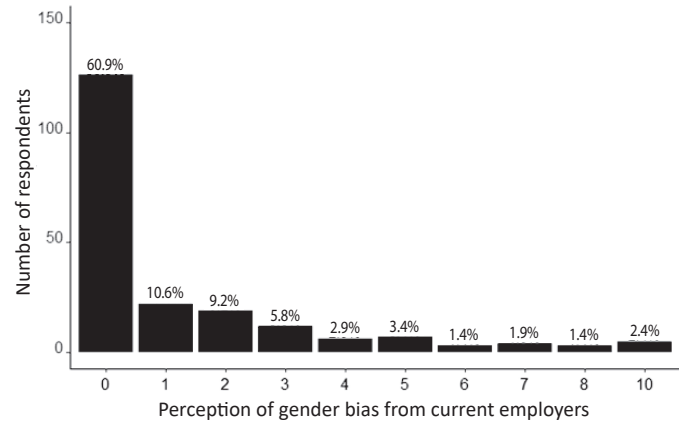


Figure 4. AABP members were surveyed to determine the perceived presence of gender bias from their current employers. Results are displayed on a scale of 0-10 with 0 being no gender bias perceived and 10 indicating constant, persistent gender bias.

broken into categories of bias and no-bias. A summary of the ordinal data can be found in Figure 5.

The number of applications submitted for the first position was associated with graduation year ($P = 0.03$), gender ($P < 0.01$), and being the first of the respondent's gender at the practice ($P = 0.02$). The number of applications for survey respondents' first position showed a general decrease over time from those graduating before 1990 (3.72 ± 0.85) to those graduating in 2000-2010 (1.52 ± 1.26). The most recent graduates in 2000-2017 (5.36 ± 1.17) noted the most applications for their first position. In regards to gender, women (8.54 ± 1.34) submitted significantly more applications than men (3.73 ± 0.85) when applying for the first position. A summary of responses for the number of applications for survey respondents' first position can be found in Figure 6.

The number of interviews received for survey respondents' first position ($P = 0.01$) was significantly associated

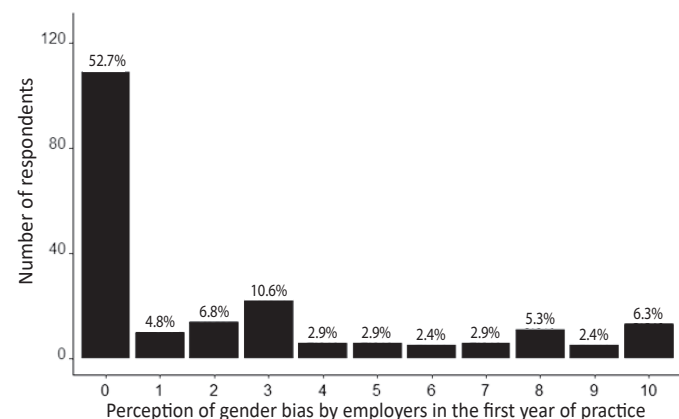


Figure 5. AABP members were surveyed to determine the perceived presence of gender bias from their employers in the first year of practice. Results are displayed on a scale of 0-10 with 0 being no gender bias perceived and 10 indicating constant, persistent gender bias.

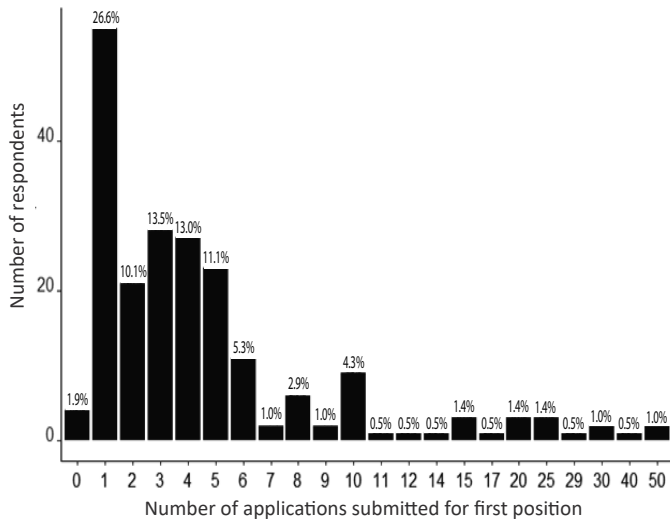


Figure 6. AABP members were surveyed to determine the number of applications submitted during the application/hiring process when obtaining one's first position.

with graduation year. The number of first interviews increased with those graduating before 1990 (2.81 ± 0.36) participating in significantly fewer interviews than those graduating in 2000-2017 (4.31 ± 0.39), except for graduates from 2000-2010 who experienced numerically fewer than all other time frames (2.58 ± 0.45). A summary of responses for the number of interviews in the first year is presented in Figure 7.

The ratio of interviews to applications for survey respondents' first position was significantly associated with gender. There was a significant ($P < 0.01$) difference in the ratio of interviews to applications when looking at men and women. The ratio was higher for men (1.01 ± 0.05) than for women (0.70 ± 0.06). A breakdown of the number of interviews to applications in one's first position can be found in

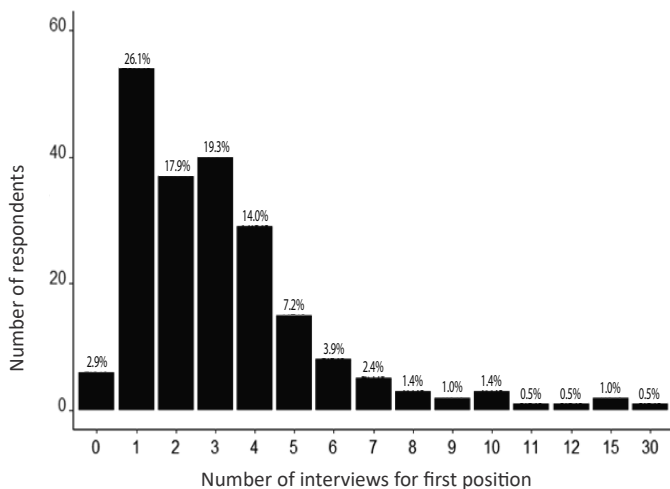


Figure 7. AABP members were surveyed to determine the number of interviews received during the application/hiring process when obtaining one's first position.

Figure 8. A list of all the outcomes and significant associations can be found in Table 2.

Discussion

As the number of female veterinarians continues to climb, the veterinary profession must continue to evolve. Potential reasons for the shift in gender have been hypothesized; explanations include decreased gender bias during admission to colleges, new treatment practices for large animals, women demonstrating success in the field, and increased number of seats in veterinary classes which have been filled mainly by women.^{6,14} While these factors could be potential reasons for the increase in women in the industry, they do not describe potential gender bias that may exist.

This study suggests that gender bias occurs in the profession, with more gender bias being experienced by recent women graduates. Additionally, there is more gender bias being perceived from clients than employers. In regards to bias being experienced from clients and employers, gender and graduation year were important factors. McKinsey & Company's report on Women in the Workplace 2019 indicated younger generations in general will experience more bias simply due to being seen as inexperienced.³ This coincides with our findings illustrating recent graduates were more likely to encounter bias compared to older graduates, although this effect was modified by gender, with recent graduate females more likely to report bias compared to males. In the older graduates with more experience in the profession, the reports of current client bias was not different between males and females.

The increase in veterinary college graduates and above average growth rate of the profession will drive the importance placed on applications and interviews when looking for an employee. This study showed factors of gender and graduation year influenced the number of applications and in-

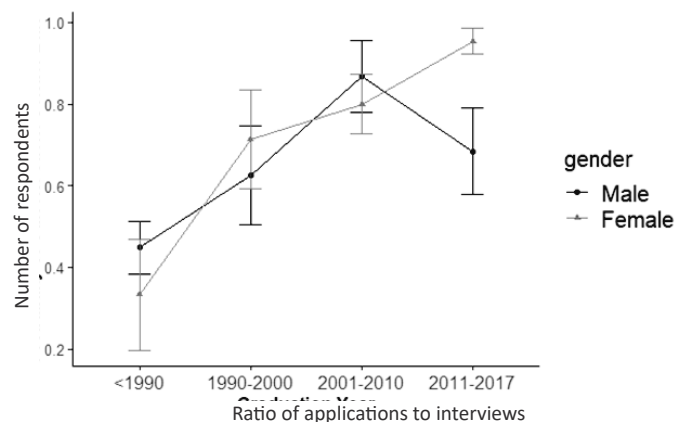


Figure 8. AABP members were surveyed to determine the number of applications submitted and interviews received during the application/hiring process when obtaining one's first position. A ratio of applications to interviews was then calculated.

Table 2. Significant factors associated with perception of gender bias, number of applications submitted, and number of interviews for respondents' first position based on a series of multivariable models of responses to a survey of AABP members about perceptions and experiences of gender bias.

Outcomes of interest	Significant factors	P-value
Perceived presence of gender bias from current clients	Graduation year * Gender	0.04
Perceived presence of gender bias from clients in the first year of practice	Graduation year	0.04
	Gender	<0.01
Perceived presence of gender bias from current employers	No significant factors	
Perceived presence of gender bias from employers in the first year of practice	Gender	<0.01
Number of interviews received for first position	Graduation year	0.01
Number of applications submitted for first position	Graduation year	0.03
	Gender	<0.01
	First of your gender at the practice	0.02
Number of interviews to applications for first position	Gender	<0.01

interviews received. A 2013 study of graduates of US veterinary medical colleges indicated both men and women were most often receiving 1 employment offer following graduation (52.6% and 63.6%, respectively), but men noted receiving 4 or more offers at a higher rate than women (11.3% and 4.6%, respectively).⁵

The wording of the survey questions did not allow a determination as to whether the bias was against or toward either gender. A larger study including more specific questions regarding gender bias may help better identify possible associations.

Conclusions

This study showed that respondents experienced more bias from clients than employers, both currently and in their first year of practice. While reports of gender bias are discouraging, employers did appear to be less likely to show bias compared to clients. Additionally, our data would indicate gender bias is encountered by veterinarians, with more being perceived by recent women graduates. From this study, several future key research areas to the veterinary field can be suggested. First, further investigate the actual rate at which bias is happening. Second, consider effective approaches to countering bias. Third, enhance the public stance of the profession on gender bias, sexual harassment, and discrimination.

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