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STRESS, BURNOUT, AND WELL-BEING IN NEW VETERINARY GRADUATES: EVALUATING A PILOT ONLINE PROFESSIONAL DEVELOPMENT PROGRAM

THESIS

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in
Community and Leadership Development in the
College of Agriculture, Food and Environment
at the University of Kentucky

By

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Lexington, Kentucky

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2021

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ABSTRACT OF THESIS

STRESS, BURNOUT, AND WELL-BEING IN NEW VETERINARY GRADUATES: EVALUATING A PILOT ONLINE PROFESSIONAL DEVELOPMENT PROGRAM

Suicide, stress, and burnout are occurring at high rates among veterinary professionals, and the transition from student to practicing veterinarian has been shown to be a particularly stressful time. The aim of this study was to evaluate an online professional development program for new veterinary graduates incorporating peer social support and training in professional skills important for success in the transition to practice. In this mixed methods study, the program was evaluated qualitatively with focus group data and quantitatively by assessing knowledge gained and levels of stress, burnout, social support, and well-being. Seven new veterinary graduates participated in the program, and 31 new veterinary graduates participated in the waitlist control group. Prior to the program, the mean stress level of all veterinarians in the study was found to be significantly higher than the mean stress level of a similarly aged cohort of the general population. After participation in the program, the mean exhaustion level, a component of burnout, was significantly lower for program participants as compared to the control group. The themes arising from the focus group suggested that the program provided an important support network and improvements were reported in self-awareness, self-care, communication skills, and decision making.

KEYWORDS: veterinarian, veterinary well-being, professional skills, transition to practice, burnout, well-being

Addie Rose Reinhard

(Name of Student)

03/19/2021

Date

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03/19/2021
Date

DEDICATION

To all veterinarians,
feeling overwhelmed and exhausted.
Know that you are not alone.
May we support one another,
growing together as
one community.

ACKNOWLEDGMENTS

I first want to acknowledge all of the individuals who believed in my vision to create a novel mentorship program to support new veterinary graduates and emboldened me to think big—but also kept me grounded reminding me that Rome wasn't built in a day.

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CHAPTER 1. INTRODUCTION

1.1 The Research Problem

There is growing evidence that stress, burnout, and suicide are occurring at high rates within the veterinary profession. Suicide among veterinarians is occurring at higher rates than the general population with female veterinarians being approximately three times as likely as the general population to die by suicide (Tomasi et al., 2019). A particularly stressful time for veterinarians is during the start of the veterinary career.

Young veterinarians reported high levels of stress in the veterinary workplace with the main sources of stress including hours worked, expectations of clients, and unanticipated outcomes (Gardner & Hini, 2006). Approximately one in every eight recent veterinary graduates (practicing less than 5 years) reported having serious psychological distress with commonly reported stressors including the demands of practice, making mistakes, educational debt, and complaints from clients (Nett et al., 2015). Experiencing these stressors regularly in the veterinary workplace may lead to burnout. During the first 5 years of veterinary practice, about half of veterinarians experienced burnout, and this group also had higher depression scores and higher levels of stress compared to veterinarians who have been in practice longer (Hatch et al., 2011).

Because of the vast amount of medical knowledge and technical skills covered during the busy veterinary medical curriculum, there has been little time for training on self-care or non-clinical professional skills. Veterinarians are regularly faced with ethical conflicts in the workplace, but only about 3 out of 10 veterinarians reported receiving training during veterinary school on conflict resolution or self-care (Moses et al., 2018). These professional skills have been shown to be vital for success during the transition into the workplace. Recent graduates and their employers frequently mentioned the importance of communication skills, support, and confidence and self-efficacy in success during the transition to practice (Bell et al., 2019). With high levels of burnout and stress within the veterinary profession, especially apparent during the transition from student to clinician, and limited formal professional skills training provided during the veterinary curriculum, intervention programs could be implemented and evaluated to equip new graduate

veterinarians with professional skills to cope with stress and increase well-being in the veterinary practice.

1.2 Previous Interventions

Because the transition from veterinary student to practicing veterinarian can be stressful, it is important to provide this population of veterinarians with supportive resources. There have been professional development programs implemented within the recent graduate veterinary population that have been successful. The implementation of a 1 year professional development program in the Netherlands for recently graduated veterinarians was shown to increase personal resources including pro-active behavior, self-efficacy, and reflective behavior (Mastenbroek et al., 2015). Blum (2018) reported positive participant feedback after implementing a professional development program for veterinary interns at Angell Animal Medical Center in Boston consisting of monthly 1-hour open discussion meetings.

Successful professional development programs have also been implemented within veterinary schools. A 6-hour self-care and mental well-being workshop for veterinary students taught practical skills and evidence-based strategies that lead to sustained mental well-being, and this program was shown to increase certain self-reported measures of resilience in veterinary students (Moffett & Bartram, 2017). A peer support program developed for veterinary students showed that the 26-hour Oxford University peer support training led to improved self-awareness and improved communication skills in the peer mentors who completed the training (Spielman et al., 2015). It is apparent that programs created to educate individuals on self-care and professional skills can be successful, yet little research has been done evaluating program development for veterinarians transitioning into clinical practice in the United States.

1.3 The Deficiencies in Literature

The Merck Animal Health Veterinary Wellbeing Study was one of the first studies to assess well-being levels among veterinarians and found that well-being among veterinarians practicing in the United States appeared to be slightly lower than the general

population (Volk et al., 2018). Little research has focused on burnout, stress, and well-being levels specifically within new veterinary graduates practicing in the United States. While many studies have assessed these levels within the veterinary profession, little previous research has focused specifically on mental health and well-being during the transition from student to practitioner in the United States including what factors make this period unique.

Researchers have suggested the development and evaluation of interventions to support mental health in veterinarians (Bartram et al., 2009). Other researchers have suggested providing training for veterinarians in coping with stress at work to improve mental well-being (Fritschi et al., 2009). Despite the many studies that have explored the incidence of mental health issues within the veterinary profession, very few researchers have developed and assessed interventions to promote veterinary well-being. Research-based interventions for recent veterinary graduates are also rarely reported. Moses et al. (2018) reported that there are no programs currently in operation that provide training and support for veterinarians in managing distress felt in their daily work. There has been a clear call to action from many veterinary mental health researchers for the development and evaluation of training to equip veterinarians with resources to cope with the stressors of veterinary practice to improve well-being.

1.4 Audiences Finding the Study of Interest

This study could be useful for recent veterinary graduates because it evaluates an evidence-based program for veterinarians transitioning to practice. This population of individuals has been shown to have high levels of stress (Bartram et al., 2009; Gardner & Hini, 2006), and any resources to promote well-being and decrease stress could be potentially helpful. There have been very few research-based interventions developed for this specific population, so the evaluation of this professional development program could be used as a guide to create similar programs or allow program expansion to a larger target population of veterinarians.

This study could also be of interest for veterinary school administrators and professors developing curriculum to better prepare their graduates for the stresses of

practice. The findings from this study could also be used as a guide to assist veterinary practices and corporations in developing training programs and support structures for early-career veterinarians.

1.5 Abbreviated Purpose Statement and Hypotheses

The purpose of this quasi-experimental study was to evaluate a pilot online professional development program for new veterinary graduates transitioning into clinical practice. The professional development program incorporated structured peer social support and learning modules covering professional skills helpful for veterinary practice. Using an explanatory sequential mixed methods design, quantitative data was obtained from program participants and a control group regarding self-reported stress, burnout, social support, and well-being during the transition to practice. Qualitative focus group data was also obtained to further explain the quantitative data. The quantitative and qualitative data collected also assessed program impact on knowledge regarding non-clinical professional skills.

It was hypothesized that new veterinary graduates who participated in the professional development program would have lower levels of burnout and stress and higher levels of social support and well-being after the completion of the program compared to veterinary graduates in the waitlist control group. In addition, it was hypothesized that program participants would improve knowledge of professional skills topics covered in the program.

1.6 Thesis Structure

First, the literature review in Chapter 2 will describe the current status of mental health and well-being within the veterinary profession including experiences in the transition to practice and previous interventions targeted at improving mental health and well-being. After the literature review, a conceptual framework and study hypotheses will be presented. In Chapter 3, the professional development program will be described followed by methods to evaluate the program. Chapter 4 will describe the results of this mixed methods study including quantitative survey data and qualitative focus group data.

Finally, Chapter 5 will provide a discussion of the results, recommendations for future research, implications of the present study, and conclusions.

CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

In this literature review, veterinary mental health will be discussed in the contexts of suicide, psychological health, burnout, and compassion fatigue. Subsequently, possible contributing factors to the mental health status of veterinarians will be discussed. The first several years of practice have been found to be a particularly stressful time for veterinarians (Hatch et al., 2011; Heath, 2008); therefore, literature will be reviewed discussing experiences during the transition from student to practicing veterinarian. The results of these studies provide justification for offering professional development interventions to new veterinary graduates. In addition, studies evaluating the successes and limitations of previously implemented mental health intervention programs within the veterinary profession will be discussed. A conceptual framework will then be presented suggesting the potential effects of a professional development program on stress, burnout, and well-being for veterinarians transitioning into practice. Finally, the purpose statement and research hypotheses of this study will be stated.

2.2 Mental Health and Well-being in the Veterinary Profession

Suicide

Perhaps one of the most shocking and consistent findings in the veterinary mental health literature is the high suicide rate among veterinary professionals. Consistently, veterinarians rank higher in suicide rates than the general population and many other professions. Tomasi et al. (2019), recognizing the shifting demographic from a male to female predominant profession coupled with an increase in companion animal clinical care, sought to assess suicide rates for veterinarians in the United States. The researchers collected records of deceased U.S. veterinarians from the American Veterinary Medical Association (AVMA) and calculated proportionate mortality ratios by dividing the number of suicides observed in the reports by the expected number of suicides for veterinarians. This study found that, compared to the general population, male veterinarians were 2.1 times as likely and female veterinarians were 3.5 times as likely to die by suicide. The

researchers also found that both clinical and non-clinical veterinarians had significantly higher suicide rates than the general population.

Similar findings of high suicide rates in veterinary populations have been seen across the world. In the United Kingdom, Mellanby (2005) compared the incidence of suicide in British veterinarians to the general population and other health care professions. Mellanby found that British veterinarians had one of the highest suicide rates of any occupation and significantly higher suicide rates than medical practitioners. Also, Mellanby found that suicides relative to deaths due to other causes were much higher in the veterinary population compared to the population of the entire country. Similarly, the rates of suicide among veterinarians in Australia were markedly higher in veterinarians (roughly four times higher) than the respective state population suicide rates (Jones-Fairnie et al., 2008). Apparent from the studies described above, veterinarians have consistently high rates of suicide compared to the general population. This finding of high suicide rates among veterinarians is not limited to the United States and has been reported in several other countries.

The causes of elevated rates of suicide in a population are often a complex web of contributing factors. Bartram and Baldwin (2008) suggested a hypothetical model explaining the high risk of suicide in veterinarians and stated the main contributing factors may include: available lethal medications at veterinary practices and knowledge of how to use them; views on death and euthanasia that may lead to self-justification and lower the inhibition for suicide; knowing other individuals who have completed suicide; cognitive and personality factors; feeling professionally and socially isolated; work-related stressors common in the veterinary profession; mental illnesses; and stigma towards mental illness resulting in the reduced help-seeking. Veterinarians in many different geographical locations have been shown to have increased rates of suicide compared to the general population, and this elevation in the suicide rate is a complex combination of contributing factors.

Psychological Health and Well-being

Mental well-being has been defined in various ways but broadly, "relates to a person's psychological functioning, life-satisfaction and ability to develop and maintain mutually benefiting relationships" and "includes the ability to maintain a sense of

autonomy, self acceptance, personal growth, purpose in life and self esteem" (Stewart-Brown & Janmohamed, 2008, p. 2). Ryan and Deci (2001) describe two main perspectives of mental well-being including a hedonic perspective which relates to subjective happiness and satisfaction with life and the eudaimonic perspective which focuses on meaning and self-realization through satisfying the needs of autonomy, competence, and relatedness. Mental well-being differs substantially from mental illnesses which are defined as "illnesses which affect mood, affect and the ability to function effectively and appropriately" (Stewart-Brown & Janmohamed, 2008, p. 2). It is important to note that mental well-being is not solely defined by the absence of mental illness, but rather, it describes an individual's level of happiness or self-actualization.

To understand the current status of mental health in veterinarians, it is important to review the psychological health and well-being levels reported for veterinarians. Moses et al. (2018) surveyed veterinarians in North America and found that many veterinarians felt distressed or anxious about their work with 35% sometimes feeling that way and 43% feeling that way often. Nett et al. (2015) performed a cross-sectional survey study of over 10,000 U.S. veterinarians to evaluate risk factors for suicide and common stressors in practice. The researchers found that 1 in 11 veterinarians had serious psychological distress with female veterinarians and veterinarians under the age of 49 having a significantly higher prevalence of psychological distress. This study found that veterinarians compared to the U.S. adult population had higher rates of serious psychological distress, depression, and suicidal ideation. As with any survey study, caution must be used when interpreting results due to the chance of self-selection bias. An additional limitation of this study was that a randomized sample of U.S. veterinarians was not used.

The findings of the Merck Animal Health Veterinary Wellbeing Survey evaluated the prevalence of serious mental health issues and well-being levels among veterinarians in the United States (Volk et al., 2018). Subjective well-being was evaluated in this study using the Satisfaction with Life Scale (Diener et al., 1985). Volk et al. (2018) found that overall, veterinarians did not have higher rates of serious psychological distress but did have slightly lower levels of well-being as compared to the general U.S. population. These results contrasted with the results of Nett et al. (2015) which showed a higher level of serious psychological distress in veterinarians than the U.S. adult population. Volk et al.

(2018) did find that younger veterinarians seemed to be at a greater level of risk with higher levels of serious psychological distress and lower levels of well-being, and these findings were seen again in the second Merck Animal Health Wellbeing Study (Volk et al., 2020). Volk et al. (2018) found that some of the most common associated factors for higher levels of psychological distress were high levels of student debt and working long hours. The researchers concluded that even mentally healthy veterinarians were experiencing feelings of depression, compassion fatigue, anxiety, and burnout. One of the main limitations of this study was the low survey response rate (17.7%) resulting in a possible non-response bias, but the researchers weighted the responses to ensure a representative sample. This study was an important addition to the literature because it evaluated psychological distress and well-being in a large, randomized sample of U.S. veterinarians.

Other countries have also evaluated psychological health among veterinarians. Fritschi et al. (2009) explored the levels of psychological distress, work-related anxiety, and depression by performing a survey study including over 2,000 Australian veterinarians and found that one-third of veterinarians self-reported as having poor psychological health. The researchers also found increased distress, anxiety, and depression in recent veterinary graduates compared to veterinarians who had been in practice longer with over one-third of recent graduate veterinarians reporting being more anxious than content at work. Bartram et al. (2009) conducted a cross-sectional survey study evaluating mental health within the U.K. veterinary profession. The authors received responses from 1,796 participants with a response rate of 56.1%. Of the veterinarians sampled in this study, 29.4% had suicidal ideation (life not worth living, death wishes, or suicidal thoughts) in the previous year, and 16.8% of veterinarians had both anxiety and depression. Some of the other main findings of this study were that veterinarians reported higher levels of anxiety and depressive symptoms, a higher 1 year prevalence of suicidal thoughts, less favorable psychosocial working characteristics, and lower levels of well-being than the general population.

In conclusion, veterinarians appear to have slightly higher rates of certain mental health illnesses and lower levels of mental well-being as compared to the general population. While there is conflicting information on the levels of serious psychological distress within the U.S. veterinary population, it is apparent that across all veterinary

populations, younger veterinarians seem to be at a higher risk for mental health issues and decreased well-being. The levels of well-being within the veterinary population have only been evaluated in a few studies; therefore, future research could focus on better classifying well-being within the veterinary profession. Also, while many studies have evaluated rates and risks for mental health issues within the veterinary population, very few studies have described intervention programs for these populations. Further research studies could focus on evaluating intervention strategies to improve mental health, especially in young veterinarians.

Burnout

Burnout can be defined as "a psychological syndrome emerging as a prolonged response to chronic interpersonal stressors on the job" (Maslach & Leiter, 2016, p.103). Maslach and Leiter explain that burnout can occur in the workplace resulting in extreme exhaustion and feelings of detachment, cynicism, and lack of efficacy. Reijula et al. (2003) described the results of a survey study of Finish veterinarians that was performed to evaluate the health of veterinarians and veterinary working conditions. The researchers found that 40% of respondents had moderate symptoms and 1.7% had severe symptoms of work-related burnout. This study had a high response rate (67%) thus reducing the risk of non-response bias.

The 2020 Merk Animal Health Veterinary Wellbeing Study surveyed a large randomized sample of U.S. veterinarians and found that burnout scores of veterinarians were higher than mean burnout scores for physicians and working adults (Volk et al., 2020). This study reported that the factors most strongly associated with higher levels of burnout included having interpersonal conflicts with co-workers, no work-life balance, and not finding work enjoyable or invigorating. Similarly, a study that surveyed Canadian veterinarians found significantly higher mean levels of exhaustion and depersonalization as compared to a normative population of medical professionals (Perret et al., 2020).

Hatch et al. (2011) performed a survey of almost 2,000 Australian veterinarians to evaluate levels of depression, burnout, and psychological distress in veterinarians. The researchers found that there was a high percentage of burnout (55%) in the first 5 years after graduation, and overall, veterinarians had higher levels of personal, work, and client burnout than the control population. These findings were similar to a recent study of North

American veterinarians. Kipperman et al. (2017) surveyed veterinarians to determine opinions regarding costs of care and the effect that client financial limitations may have on professional burnout. This study found that 49% of veterinarians self-reported that they had moderate to substantial professional burnout, and 77% of veterinarians reported that financial limitations of clients were a moderate or primary contributor to their level of burnout. One of the major limitations of this study in assessing burnout was that no validated burnout scale was used to measure burnout; rather, the level of burnout was self-reported based on the answer to one question.

Compassion Fatigue

Compassion fatigue has been described as tension and preoccupation regarding another's trauma resulting from witnessing the suffering of others and can include symptoms of dissociation, numbness, isolation, heightened state of alertness, issues sleeping, crying more often, and avoidance and/or obsession (Cohen, 2007; Figley, 2002). Figley (2002) speculated that compassion fatigue results from prolonged compassion stress which may occur as a result of having empathy for someone's suffering coupled with a desire to relieve their suffering. Several factors could potentially contribute to compassion fatigue within the veterinary profession. Veterinarians may be faced with situations where animals are suffering, and there are no treatments or cures for the diseases that the animals have. Alternatively, treatment may be available, but contextual circumstances including client financial limitations may prevent veterinarians from administering treatment to an animal. In some of these cases, veterinarians may perform humane euthanasia.

Few studies to date have measured the incidence of compassion fatigue within the veterinary profession. Volk et al. (2018) reported that some veterinarians who had good mental health had experienced feelings of compassion fatigue. Rohlf and Bennett (2005) performed a survey study to assess the incidence of perpetuation-induced traumatic stress in 150 Australian animal workers who participated in euthanasia including veterinarians, veterinary nurses, animal shelter workers, and research staff. This study used a validated traumatic stress scale and found that 11% of the participants had moderate levels of traumatic symptoms including recurrent thoughts, nightmares, and avoiding emotions associated with euthanasia, and 39% had symptoms within the mild range. Over two-thirds

of the participants entered an animal-based occupation because of love, respect, or empathy with animals. The researchers concluded that employees participating in animal euthanasia may be at risk for developing traumatic stress symptoms, and social support and work experience appear to be related to coping with this stress.

One of the most recent studies evaluating the prevalence of compassion fatigue within the veterinary profession showed significantly higher mean secondary traumatic stress scores for Canadian veterinarians as compared to a normative mean (Perret et al., 2020). Veterinarians may be at risk for compassion fatigue due to their exposure to traumatic experiences within the veterinary practice including euthanasia and ethical dilemmas. Future research should assess the incidence of compassion fatigue within the veterinary profession in the United States to determine if future interventions should focus on preventing and treating this syndrome.

2.3 Possible Factors Affecting Mental Health of Veterinarians

Stress

Lazarus and Folkman defined psychological stress as "a relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (Lazarus & Folkman, 1984, p. 21). According to Lazarus and Folkman's stress theory, demands and pressures are appraised or assessed by people in different ways. This theory stated that the primary appraisal process occurs during the first exposure to a situation, and the individual deems the situation as either irrelevant, benign-positive, or stressful. Further, the theory stated that a stressful primary appraisal may include scenarios having harm or loss where the damage or loss has already been experienced; a threat that is expected to cause harm or loss; or a challenge that holds the possibility for gain. After the primary appraisal of a situation is deemed stressful, the secondary appraisal process evaluates what could be done in the situation.

Lazarus and Folkman's stress theory defined coping as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman,

1984, p. 141). This theory classified coping into two major categories: problem-focused coping and emotion-focused coping. Lazarus and Folkman described emotion-focused coping as strategies to regulate the emotional response to a stressor and are more likely to be used when there is nothing that can be done to change a harmful, threatening, or challenging condition. They posited that problem-focused coping directs efforts to define the problem, generate solutions, weigh alternatives, choose one of the solutions, and act on the solution. Some coping resources described by this theory are physical resources such as health, positive beliefs, problem-solving skills, social skills, material resources, and social support. Specifically, Lazarus and Folkman stated that social support may act as a buffer to stress and help to prevent stress by providing resources to cope with stressors.

Many studies have shown associations between stress in the workplace and mental health. Melchior et al. (2007) performed a longitudinal study of work stress on mental health issues. This study found that psychological job demands such as high workload and intense time pressures contributed to depression and generalized anxiety disorder, and stress at work predicted the onset of these conditions in participants with no prior history of these conditions. Because of its longitudinal nature, this study highlighted that high levels of work-related stress were a causative factor for anxiety and depression. Higher levels of perceived stress were associated with lower levels of well-being in wives of spouses of deployed military personnel (Padden et al., 2011). This study also found that increased evasive and emotive coping was related to increased perceived stress and decreased well-being. McManus et al. (2002) performed a longitudinal study of U.K. doctors to assess the effect of stress on burnout. The researchers found that stress had a causal effect on emotional exhaustion, one of the three components of burnout, and emotional exhaustion also had a causal effect on stress.

The veterinary profession has been found to be a stressful career. A survey of over 9,000 U.K. veterinarians found that 88 percent of veterinarians agreed or strongly agreed that veterinary work is stressful (Robinson & Hooker, 2006). These findings are very similar to a Finish study which found that 73% of Finish veterinarians self-reported being rather or very stressed (Reijula et al., 2003). Heath (2008) performed a survey study of 350 recently graduated Australian veterinarians and found that 75% of female and 57% of male veterinarians reported feeling significant and regular stress, and higher levels of stress

were seen in veterinarians who felt that they did not have adequate levels of support. This study showed a very high response rate of 73% which supports the validity of the data. The finding that stress levels were high in young veterinarians was also demonstrated by Hatch et al. (2011) who found that veterinarians within 10 years of graduation were more likely to have high stress scores.

Gardner and Hini (2006) conducted a study using 927 survey responses from New Zealand veterinarians to assess the causes of work stress, perceptions of stress levels, and social support for veterinarians. Overall, young veterinarians and female veterinarians in this study were more likely to have higher levels of work-related stress than older veterinarians and male veterinarians. The researchers found that hours worked and unanticipated outcomes were some of the most common sources of stress. The young veterinarians in the study were more likely to be stressed by hours worked, expectations of clients, client communication, inadequate support, and unanticipated outcomes compared to veterinarians who had been in practice longer. This study provided insight on some of the common stressors for veterinarians so that programs can be targeted to help cope with those stressors. It also provided justification for providing support programs for young veterinarians who tend to be more stressed about their work than veterinarians who have been in practice longer.

Client behaviors in the companion animal veterinary workplace have been shown to be associated with stress and burnout in veterinarians (Spitznagel et al., 2019). Spitznagel et al. developed and validated a Burden Transfer Inventory through surveying practicing small animal veterinarians and dog and cat owners. In this study, it was concluded that veterinarians had higher levels of stress and burnout than comparison populations. The researchers of this study found that stress and burnout levels in veterinarians were positively correlated with the frequency of experiencing stressful client behaviors and interactions. Also, the researchers found that veterinarians' stress and burnout levels were predicted by their reactions to the perceived stressors or how upset they were about the stressful client behaviors and interactions. This study was an important contribution to the research on stress in the veterinary career because it used validated measures of stress and burnout and demonstrated how client interactions and behaviors may be associated with the levels of stress and burnout. The authors suggested that

interventions should focus on modifying the response that veterinarians have to stressful situations by providing training to improve the coping skills of veterinarians.

Other studies have assessed factors associated with stress in veterinarians. Bartram et al. (2009) found that veterinarians, compared to the general population, self-reported as having less favorable working conditions, and younger veterinarians (<49 years of age) reported the least favorable work conditions. The researchers found that the greatest sources of stress were the number of hours worked, making mistakes at work, expectations of clients, and administrative and clerical tasks. The greatest stressors for veterinarians in clinical practice were the potential for client complaints, unanticipated case outcomes, and on-call duties. Nett et al. (2015) reported that some of the most common stressors for associate veterinarians were the demands of practice, making mistakes at work, complaints from clients, client expectations, and educational debt. These studies helped reveal the greatest contributors to stress in practice to better classify what types of interventions could be developed to reduce stress in the veterinary profession.

In conclusion, research has shown that stress is common within the veterinary profession, and young veterinarians and recent graduates seem to have a particularly high risk for stress (Bartram et al., 2009; Gardner & Hini, 2006; Heath, 2008). Little research has evaluated the stress levels of new veterinary graduates in the United States, and an area for future research could be to characterize stress levels in new veterinary graduates in the United States using a validated scale. The most commonly reported stressors across all studies were educational debt, client behaviors and interactions, and the demands of practice including long hours worked (Gardner & Hini, 2006; Nett et al., 2015; Spitznagel et al., 2019). Of particular concern, chronic stress in the workplace has been shown to cause depression, anxiety, and burnout (McManus et al., 2002; Melchior et al., 2007). Many stressors present within the veterinary workplace may not be able to be completely mitigated but improving the ability to cope with these stressors will be necessary to improve well-being within the veterinary profession. Intervention programs designed to improve coping skills could help to decrease stress in the veterinary practice.

Identity

Some studies have evaluated the role of identity within the veterinary profession. Page-Jones and Abbey (2015) completed a narrative inquiry of 10 U.K. veterinarians and

10 U.K. veterinary nurses to evaluate career identity in the veterinary profession. The researchers found that many participants' veterinary career identity was central to their overall identity, and many participants began forming a veterinary identity very early in life. Page-Jones and Abbey found common themes for the veterinary identity including participants perceiving themselves as a learner and technically competent; a teacher and educator; ethical and moral; and dedicated and resilient. While Page-Jones and Abbey mainly focused on the business benefits of understanding the veterinary identity, Allister (2015) argued that the research could have larger implications. Allister suggested that because veterinarians' sense of self and self-esteem was found to be so closely connected to their veterinary career identity, psychological issues may occur when there are situations in practice where veterinarians cannot act in line with their professional identity.

Armitage-Chan and May (2018) investigated the identities of twelve recent U.K. veterinary graduates participating in a private social media discussion group through narrative inquiry. This study revealed that recent graduate veterinarians had either a diagnosis-focused identity or a challenge-focused identity. The researchers found that veterinarians with a diagnosis-focused identity valued obtaining a diagnosis and treating patients, and when situations in practice prevented veterinarians from diagnosing or treating their patients, frustration and disappointment were apparent. This frustration and disappointment among new veterinary graduates when a situation occurred that conflicted with their veterinary identity was consistent with Allister's suggestion that this type of scenario may cause psychological effects (2015). Armitage-Chan and May recognized that veterinarians with a challenge-focused identity seemed more satisfied with their role in general veterinary practice as these veterinarians valued clinical skills as well as decision making and managing challenging situations which arise often within veterinary practice.

This study demonstrated the importance of early-career identity development because, as Armitage-Chan and May (2018) suggested, when a challenge-focused identity is more encouraged, veterinarians may have higher levels of satisfaction in general practice. Armitage-Chan and May concluded that veterinarians with diagnosis-focused identities may be frequently placed in situations that prevent them from achieving their goals of diagnosing and treating animals. In general practice, pet owners may have financial limitations or different attitudes on how to treat their animal, and this, coupled

with a lack of available diagnostic tools or resources within a practice, may lead to an inability of a veterinarian to obtain a definitive diagnosis or provide gold-standard treatment. In this study, veterinarians with a challenge-focused identity seemed more satisfied with their careers because they were able to more frequently perform actions that were congruent with their values.

One limitation of the previous two studies was the relatively low number of veterinarians that were interviewed. To better classify the veterinary identity, it would be helpful to interview additional veterinarians including how the veterinary identity may shift throughout the career. Also, veterinary identity should be explored across multiple countries because the veterinary identity in other countries may differ from the veterinary identity in the United Kingdom due to differences in cultural factors. By gaining a broader understanding of the veterinary identity, researchers can better understand how certain situations in the veterinary practice may cause stress.

Ethical Dilemmas

Diagnosing and treating animals and being technically competent were commonly reported veterinary identity traits (Armitage-Chan & May, 2018; Page-Jones & Abbey, 2015). Veterinary professionals often strive to provide care for animals, yet veterinarians must also satisfy the needs of the pet owner. The responsibility of caring for animals and the needs and requirements of owners may conflict resulting in a moral dilemma which can be defined as "a conflict between responsibilities or obligations of exactly equal moral weight. . . . with no obvious way to prioritize one responsibility over the other" (Morgan & McDonald, 2007, p. 165). Morgan and McDonald reported some common dilemmas faced in veterinary medicine including requests from clients to perform unnecessary or harmful procedures, requests from clients to perform humane euthanize for healthy animals, and failure of clients to provide financial resources or adequate care for their pets.

Batchelor and McKeegan (2012) performed a survey of 58 U.K. veterinarians to provide baseline data on ethical challenges faced by veterinarians and found that about half of veterinarians faced ethical dilemmas once or twice per week and a third faced dilemmas three to five times per week. This study revealed that financial limitations that restricted the options for treatment were the most common cause of ethical dilemmas faced in practice with over half of respondents reporting it as their most common dilemma. Also,

the respondents in this study reported that owners' financial limitations, euthanasia of healthy animals, and clients wishing to continue treatment on their pet with poor quality of life were very stressful dilemmas faced in practice. The main limitation of this study was the low sample size of veterinarians surveyed. Regardless of the low sample size, this study still documents that ethical dilemmas occur commonly in practice and may cause stress for veterinarians.

Similar findings were seen in a survey study performed in the United States to assess the frequency of ethical conflicts in the veterinary practice (Kipperman et al., 2018). The link to the questionnaire was sent to over 9,000 veterinarians with only 484 usable responses. This study found that 52% of veterinarians experienced ethical dilemmas at least weekly and 19% experienced ethical dilemmas at least daily. The researchers also found that 61% of veterinarians had moderate to very high stress when faced with financial limitations affecting patient care. One of the main limitations of this study was the low response rate. Also, many of the veterinarians invited to participate in the survey were members of the California Veterinary Medical Association. This could limit the generalizability of the results to the entire U.S. population because of the overrepresentation of respondents from California.

Moses et al. (2018) conducted a mixed methods study of 889 North American veterinarians to investigate the frequency of ethical conflicts encountered that may cause moral distress and the amount of formal training received to handle ethical conflicts. Moral distress can be defined as "one or more negative self-directed emotions or attitudes that arise in response to one's perceived involvement in a situation that one perceives to be morally undesirable" (Campbell et al., 2016, p. 6). Moses et al. found that there were conflicts with pet owners about how to proceed with the medical care of the pet often or sometimes for 84% of veterinarians sampled, and half of veterinarians were asked sometimes or often to do something in the course of clinical practice that felt like the wrong thing to do. The researchers found that over three out of four veterinarians reported that not being able to do the right thing for a patient caused them moderate to severe distress. Also, a vast majority of the respondents had not received any training in self-care or conflict resolution. These findings show that veterinarians were regularly faced with situations where there were conflicts and ethical dilemmas in practice causing moral

distress, but veterinarians do not receive adequate formal training in conflict resolution or self-care. Training on navigating ethical dilemmas may reduce stress for veterinarians, and this type of training could be incorporated into an intervention program for veterinarians.

Social Support

Social support may be an important factor to promote mental health and well-being in veterinarians. Social support can be defined as a "social network's provision of psychological and material resources intended to benefit an individual's ability to cope with stress" (Cohen, 2004, p. 676). Human specialist physicians surveyed revealed that frequent participation in meetings to discuss demanding work experiences was associated with lower levels of suicidal ideation (Eneroth et al., 2014). Volk et al. (2018) found an association with high levels of wellbeing and mental health in veterinarians who participated in activities involving spending time with family and socializing with friends. Similarly, in the Merck Animal Health Veterinarian Wellbeing Study II, high levels of well-being among veterinarians were strongly associated with spending time with friends and family (Volk et al., 2020).

In the veterinary profession, veterinarians frequently rely on support from colleagues and mentors to aid in decision making or assist with issues faced in practice. Moses et al. (2018) found that many veterinarians dealt with conflicts with pet owners about how to proceed with their care by discussing situations with their colleagues. Mellanby and Herrtage (2004) found that 83% of new veterinary graduates who had made a mistake discussed the error with friends, family, or colleagues. Also, high levels of satisfaction with social support were significantly associated with less euthanasia-related traumatic stress scores (Rohlf & Bennett, 2005). With stress and ethical dilemmas as common occurrences in the veterinary practice, support from colleagues, mentors, friends, and family appear to be an important coping resource for veterinarians.

2.4 Experiences of New Veterinary Graduates

Issues in the Transition to Practice

Young veterinarians appear to have high levels of stress, and the transition to practice may particularly stressful. To understand stress in young veterinarians, it is

important to review the experiences of new veterinary graduates in the transition to practice. Researchers surveyed and interviewed new U.K. veterinary graduates to develop appropriate support and continuing professional development for this population (Routly et al., 2002). The researchers found that one-third of new graduates in the study left their first job within 2 years, and some of the reasons listed included inadequate support, high workload, stress, or problems with staff. This study revealed that the common stressors that new graduates faced included being on-call, performing surgery, client communication, and prioritization. In an interview response, one new graduate responded,

> The first day? Well, I was more taken aback than I had expected. I thought it wouldn't be any problem, but it's very different going out and being confident as a student, to suddenly being in charge of whatever case you are looking at, and making the decisions. (Routly et al., 2002, p. 168)

Upon entering practice, new graduate veterinarians may be faced with a sudden increase in responsibilities that is coupled with a sense of self-doubt or fear of making mistakes (Reinhard et al., 2021). Mellanby and Herrtage (2004) found that 83% of new graduates worked frequently or always unsupervised. This increase in primary responsibility for new veterinary graduates combined with little supervision creates a possibility for mistake-making.

Mellanby and Herrtage (2004) surveyed 108 recent U.K. veterinary graduates (graduates practicing 18 months or less) to assess the number and types of mistakes made and how this impacted veterinarians. The researchers found that approximately three of four veterinarians had made a mistake in the first 18 months of their career. This study revealed that many of these mistakes had an emotional impact on the veterinarians committing the mistakes including a loss of confidence, feeling upset, feelings of stress or guilt, and sleepless nights due to the mistake. There was one report in this study of a mistake leading to severe depression, another report of a mistake leading to months of worrying and a complete lack of confidence, and three veterinarians considered a career change after a mistake was made. The study found that the most common contributing factors reported for mistakes were insufficient experience, time, and supervision and communication issues with colleagues or owners. This study had a low response rate, and so there is a possibility for non-response bias. Despite the low response rate, there is still

value in the free responses of these surveys showing that making mistakes can cause many new graduate veterinarians to become stressed, lose confidence, and even consider changing careers. Apparent from these results, training should be provided for new graduates on ways to cope with making mistakes within the veterinary practice.

Necessary Skills for Transitioning into the Veterinary Workplace

It is important to also evaluate what factors lead to success in the transition from student to practicing veterinarian. Bell et al. (2019) performed a qualitative study evaluating factors contributing to success in early-career veterinarians in Western Australia by performing individual semi-structured interviews with recent veterinary graduates (<3.5 years since graduating) and their employers. In this study, recent veterinary graduates reported that the most important factors for success in the transition to practice were support, communication skills, work-life balance, confidence and self-efficacy, and technical skills and knowledge. The researchers found that the most consistent factor emphasized by both employers and graduates was communicating with clients and team members. The main limitations of this study were the small sample size and the isolated geographic location of the participants (Western Australia) which may make it challenging to apply these results to the international population of veterinarians. Overall, this study revealed that communication skills and other non-clinical skills are just as important as technical skills for success in the transition to clinical practice from the perspective of veterinary graduates and their employers.

A mixed methods study was conducted to identify veterinary attributes that may make the transition from student to practitioner easier (Rhind et al., 2011). Recent veterinary graduates (1-2 years after graduation) and final year veterinary students from the United Kingdom believed communication and problem-solving skills, recognizing their own limitations, and coping with pressure were important. The top 10 attributes that recent graduates believed were very important (with the total percentage of respondents ranking them as very important in parentheses) included client communication (88%), colleague communication (81%), recognition of own limitations and knowing when to seek help (80%), listening skills (80%), practical skills (78%), ability to cope with pressure (71%), problem solving (70%), interpersonal and teamwork skills (67%), decision making (66%), and compassion (62%). One of the main limitations of this study was the low

response rate for participants with some cohorts having as low as an 11% response rate. This study shows that non-clinical veterinary skills are being ranked as highly as technical skills in perceived importance by new graduates and final-year veterinary students.

To gather more rich and detailed data on the new graduate experience for veterinarians within the United States, Reinhard et al. (2021) conducted a focus group with six recent veterinary graduates within the United States. Reinhard et al. found that client communication, conflict management, and self-care were perceived as some of the most important professional skills vital for success during the transition to practice, and the new graduates felt the least prepared for managing conflict and working with clients with financial constraints.

The findings from these studies can be used to guide curriculum development for a professional development program for new veterinary graduates. The results of these studies provide insight into what skills and resources are important to new graduates transitioning into practice. These studies suggest that non-clinical skills are consistently reported as being vital to success during the transition into veterinary practice.

As described above, non-clinical skills are important for new graduate veterinarians; yet, historically, veterinary students may not receive substantial training in these skills during the busy veterinary curriculum. Moses et al. (2018) found that 71% of North American veterinarians had not received any training in conflict resolution, and 79% had not received any training in self-care. Batchelor and McKeegan (2012) reported that 78% of respondents felt they did not get adequate training on ethics during the veterinary training. Many veterinary schools are beginning to incorporate communication skills, ethics, and conflict resolution training into the veterinary curriculum (Barron et al., 2017; Englar, 2017; Root Kustritz & Nault, 2010). While this increase in training during veterinary school is likely helpful to prepare new graduates for veterinary practice, some students may not see the value of the training and may spend more time focusing on scientific knowledge and technical skills. Also, while some non-clinical skills training may be covered during the veterinary school curriculum, students may not be able to apply the knowledge learned until faced with the stressors of working in the veterinary practice. Training for these skills may become more valuable and readily accepted by veterinarians once in the veterinary workplace.

2.5 Existing Mental Health Intervention Programs

The focus of the literature in veterinary mental health has been on the prevalence of mental health issues and potential causative factors. Little research has focused on intervention strategies to promote mental health and well-being within the veterinary profession. Rohlf (2018) performed a systematic literature review on evaluation studies for programs focused on stress and compassion fatigue management for individuals in the animal care industry and found only four studies. This is a surprisingly low number as the incidence of high levels of suicide and stress within the veterinary profession is well documented. There has been a clear call to action by veterinary mental health researchers to develop and evaluate mental health intervention programs for veterinarians (Bartram et al., 2009). Fritschi et al. (2009), based on their findings of poor psychological health within the veterinary professions, suggested providing training in coping with work stress, anxiety, and depression.

Some successful intervention programs to promote mental health in veterinarians have been documented in the literature. Many of these programs have been targeted at serving veterinary students and recent veterinary graduates. Mastenbroek et al. (2015) evaluated a 1 year professional development intervention program for recent veterinary graduates. The 1 year program, developed by the Royal Netherlands Veterinary Association, consisted of in-person training days every 6 weeks for a total of 10 months, supplemented with individual coaching and online learning modules. The researchers reported that the program was led by two professional coaches and consisted of training days with professional skills training, peer-coaching, and a reflection of the last 6 weeks of practice. During each training day, goals were set for the next 6 weeks, and between the meetings, participants worked on their goals. The researchers surveyed participants before and after the program and reported significantly increased reflective behavior, pro-active behavior, and self-efficacy after the completion of the program. The researchers also performed qualitative interviews and found that, after participation in the program, participants developed better self-acceptance, self-esteem, and awareness of their own influence and responsibility which was most likely related to the act of reflection throughout the program. This study demonstrated that a professional development program for recently graduated veterinarians can be a helpful resource.

A peer support program was developed for veterinary students in the United Kingdom (Spielman et al., 2015). The researchers provided 26 hours of training for the peer mentors based on an Oxford University training program including training on self-awareness, empathy, crisis management, and other important communication skills. This study revealed that 86% of the peer mentors surveyed strongly agreed that the training program equipped them with skills they would use beyond veterinary school. Also, qualitative feedback was provided from the peer mentors, and the peer mentors reported that they improved their communication skills and self-awareness. Following a peer support model, Blum (2018) reported creating a professional development program for veterinary interns at Angell Animal Medical Center in Boston. In this program, Blum conducted monthly one-hour open discussion meetings with approximately 15 veterinary interns. Blum reported that this confidential group allowed interns to discuss clinical mistakes, difficult interactions, or other topics of importance. Blum reported that the feedback from the group has been positive, though one limitation to this study is the lack of quantifiable evaluative data.

Moffett and Bartram (2017) evaluated a resilience training program for veterinary students at the University of Surrey in the United Kingdom. Participants of the study attended a 6-hour self-care and wellbeing workshop that aimed to teach students about evidence-based strategies to support mental well-being including information on gratitude, mindfulness, and techniques to cope with stress. This study found that the students participating in the intervention reported significant increases in 3 of the 10 resilience questionnaire items. Focus groups were also performed and found that overall, participants felt positive about the workshop, and several participants reported gaining a better understanding of resilience. One of the main limitations of this study is the lack of a control group; although, this study was a mixed methods study which may strengthen the results by providing both quantitative and qualitative data to better understand the effect of the intervention program on veterinary students.

The programs described above appear to be effective at promoting mental health within veterinary populations. Currently, there is a lack of published studies on intervention programs for mental health within the United States. Future studies could focus on developing and evaluating mental health support and intervention programs for

veterinarians and veterinary students within the United States. Also, successful aspects of programs already evaluated could be incorporated into new intervention programs.

2.6 Proposed Conceptual Framework

Based on the literature, common stressors in new graduates may include ethical dilemmas, client expectations, client complaints, client interactions, unexpected outcomes, navigating conflict, identity dissonance, making professional mistakes, demands of practice, lack of support, student debt, surgery, and on-call responsibilities (Armitage-Chan & May, 2018; Bartram et al., 2009; Batchelor & McKeegan, 2012; Gardner & Hini, 2006; Mellanby & Herrtage, 2004; Nett et al., 2015; Routly et al., 2002; Spitznagel et al., 2019).

Chronic stress in the workplace may lead to increased burnout and decreased well-being. By creating a professional development program for new graduates to provide training in non-clinical skills important for new graduate success, new graduates may be better prepared to cope with the common stressors faced in practice leading to a decrease in stress which would, in turn, increase well-being and decreased level of burnout. Establishing a structured social support network through connection with other new graduates may provide a coping mechanism for new graduates leading to a decrease in stress which should also decrease levels of burnout and increase well-being. Figure 2.1 provides a visual representation of this conceptual framework which was created based on the articles reviewed.

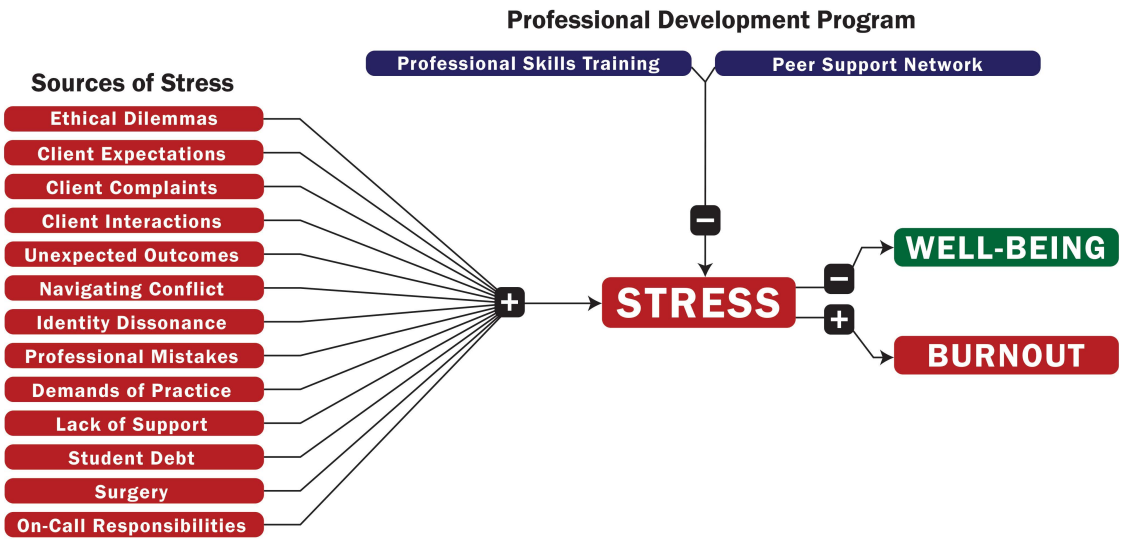

Figure 2.1 Conceptual Framework: Stress, Well-being, and Burnout in New Veterinary Graduates

2.7 Conclusions

Suicide rates within the veterinary profession were consistently higher than the general population in several countries (Jones-Fairnie et al., 2008; Mellanby, 2005; Tomasi et al., 2019). Bartram and Baldwin (2008) proposed a model for the causes of suicide in veterinary populations, and psychological conditions and work stress were suggested as possible contributing factors to the high suicide rate. Veterinarians within the United States under the age of 45 were shown to have lower levels of wellbeing and higher levels of serious psychological distress than those who had been in practice longer (Volk et al., 2018). In addition, burnout appeared to be prevalent within the veterinary profession with almost half of North American veterinarians self-reporting moderate to substantial feelings of burnout (Kipperman et al., 2017).

Many causative factors for mental health issues within the veterinary profession have been described. One of the most common factors discussed in the literature is stress in the veterinary workplace. Numerous studies have shown that stress is common in the veterinary career and seems to be especially common among young veterinarians and female veterinarians (Bartram et al., 2009; Gardner & Hini, 2006), and chronic stress may

contribute to burnout and decreased well-being. While many studies have described stress in veterinarians, few studies have focused on stress in new veterinary graduates within the United States. Scenarios that conflict with a veterinarian's identity may be another cause of mental health issues within veterinarians. Recent graduates who were classified as having a diagnosis-focused identity exhibited signs of low emotional health and experienced feelings of frustration and disappointment when situations prevented them from diagnosing or treating their patients (Armitage-Chan & May, 2018). Facing frequent ethical dilemmas may also contribute to workplace stress and psychological distress (Kipperman et al., 2018; Moses et al., 2018). Social support may have some protective factors for mental health, and many of the studies reviewed showed that veterinarians sometimes use social support from colleagues, friends, or family, and social support may be associated with higher levels of well-being among veterinarians (Moses et al., 2018; Volk et al., 2018; Volk et al., 2020).

Because young veterinarians have been shown to have higher levels of stress, research analyzing the transition to practice could help explain why stress levels are so high for young veterinarians. During the transition to practice, some reasons that veterinarians may experience high levels of stress included making professional mistakes, being on-call, and communicating with clients (Mellanby & Herrtage, 2004; Routly et al., 2002). Because this period appeared to be stressful, it is important to evaluate the skills needed for success as a recent veterinary graduate. Non-clinical skills were ranked just as important as clinical skills in success during the transition to practice by recent veterinary graduates (Rhind et al., 2011).

While professional skills appear to be perceived as important, in previous years, many veterinary students may have not received much training in these skills, and it was reported that over two-thirds of veterinarians did not receive training in conflict resolution or self-care (Moses et al., 2018). While some universities may be beginning to offer more professional skills training, new graduates may gain additional value from this type of training if it was offered again during their early-career when new graduates can apply the concepts that they are learning to situations faced in practice.

Many studies have assessed the mental health of veterinarians, but very few studies to date have focused on the implementation and evaluation of intervention programs for

veterinarians. A professional development program for recent graduates implemented in the Netherlands was successful at increasing reflective behavior, pro-active behavior, and self-efficacy (Mastenbroek et al., 2015). There is currently a lack of studies within the United States focused on developing and evaluating intervention programs to support mental health and well-being among veterinarians. The successful aspects of other intervention programs in addition to the incorporation of professional development and non-clinical skills training could provide the foundation for a professional development program for new veterinary graduates.

A conceptual framework was presented suggesting training in non-clinical professional skills may decrease stress in the transition to practice and thus decrease burnout and improve well-being. Social support from other new veterinary graduates could also improve coping resources which may decrease stress and burnout and improve well-being for new veterinary graduates. With high levels of suicide and stress within the veterinary profession, intervention programs incorporating social support and training in professional skills may help improve well-being within the veterinary profession.

2.8 Purpose Statement

The purpose of this study was to evaluate a pilot online professional development program for new veterinary graduates transitioning into clinical practice. This 5-month professional development program incorporated structured peer social support and learning modules covering non-clinical skills helpful for success in veterinary practice. Using an explanatory sequential mixed methods design, quantitative survey data was obtained from program participants that was further explained by qualitative focus group interview data. The first phase of this quasi-experimental study included collecting quantitative survey data from new veterinary graduates participating in the professional development program at baseline and upon completion of the program. The survey data assessed changes in knowledge of professional skills as well as the program participants' levels of stress, burnout, social support, and well-being. The first phase of this study also collected similar data on stress, burnout, social support, and well-being from a control group of new veterinary graduates not participating in the program. The second phase of

the study included collecting qualitative focus group data from program participants regarding their experiences in the program to help gain a more thorough understanding of program impact and to better explain the quantitative results.

2.9 Research Hypotheses

Hypothesis 1: It was hypothesized that veterinary graduates participating in the professional development program would have lower levels of stress and burnout and higher levels of well-being after the completion of the program compared to veterinary graduates not participating in the program.

The professional development program incorporated training in non-clinical skills that were perceived as important for the success in the transition from student to veterinary practice. If participants improved these non-clinical skills through training in the program, they may be better prepared for the stressors of practice. The program also incorporated training on self-care and how to cope with stress. In addition, the program also provided a coping resource through structured peer support. By providing additional personal and social resources for coping with stress, it was hypothesized that program participants would have lower levels of perceived stress after the completion of the program compared to the control population. With lower levels of stress, it was hypothesized that program participants would have a resulting increase in well-being and a decrease in burnout compared to control group participants.

Hypothesis 2: It was hypothesized that participants in the professional development program would have higher levels of informational social support after completion of the program compared to veterinarians not participating in the program.

New veterinary graduates may feel isolated from their professional community after graduating from veterinary school. Social support may have some protective factors for mental health. The professional development program attempted to provide structured social support in the form of a private social media discussion group and guided peer group discussions through the use of audiovisual technology. An important aspect of the social support provided in this program was that many of the program participants were already familiar with each other because they were from two graduating veterinary cohorts. It was

hypothesized that the program may have allowed the community created within veterinary school to extend into the early-career by allowing veterinarians to stay connected with the individuals they knew in veterinary school. Also, it was hypothesized that by connecting individuals that were already acquainted with one another, participants may have felt more comfortable sharing practice experiences and been more likely to seek and accept peer mentorship. It was hypothesized that these aspects of social support from peers who were going through similar transitions would help to augment participants' social support during the transition to practice, and therefore, participants in the professional development program were expected to have higher measures of informational social support post-program compared to a control population of new veterinary graduates.

Hypothesis 3: It was hypothesized that all veterinary graduates in the study would have higher levels of stress at baseline compared to a similarly aged cohort of the general population.

The veterinary profession has been shown to be a stressful career, and many factors may contribute to the high levels of stress within the veterinary profession. The levels of stress in veterinary practice have been found to be higher than the general population and are especially higher for younger veterinarians (Bartram et al., 2009; Gardner & Hini, 2006). It was therefore hypothesized that the mean level of stress for all veterinary graduates in the current study would be higher than the levels of stress of similarly aged individuals in the general population.

Hypothesis 4: It was hypothesized that the professional development program would be effective at increasing the knowledge of non-clinical skills topics covered in the program.

An important aspect of program evaluation was assessing the knowledge gained from the program. This program included online learning modules covering non-clinical skills topics. It was hypothesized that the program would increase knowledge of the topics covered.

CHAPTER 3. METHODS

3.1 Professional Development Program

An online professional development program was created to provide support for new graduate veterinarians during the transition to practice. This 5-month program included one online learning module covered each month for a total of five modules. Each module focused on a specific aspect of professional development. In addition, the program established a structured peer social support network to provide further support for new graduate veterinarians.

The program curriculum was developed using a foundation of experiential learning theory, adult learning theories, instructional technology theories, and backward design framework. Learning objectives were developed based on the findings from the studies reviewed in Chapter 2. In addition, a focus group was conducted with six recent veterinary graduates from the United States to establish additional areas for training and support (Reinhard et al., 2021). Based on the results of this focus group and the previous studies reviewed, modules for the professional development program provided training in non-clinical skills including self-care, leadership, conflict management, navigating ethical dilemmas, and incremental care. Using a transdisciplinary approach to curriculum development, professionals across various disciplines provided insight into curriculum development.

Social support may be vital for success during the transition from student to clinician. Veterinary students may have a large support network of faculty, clinicians, administrators, and peers to support them. When starting as a new veterinarian in practice, many new clinicians may not receive adequate support (Mellanby and Herrtage, 2004; Routly et al., 2002). One aspect of the social support provided in this program was that many program participants were already acquainted with one another prior to the start of the program because all program participants graduated from the same two veterinary schools. Two social support mechanisms were provided in this study including a private social media discussion group and guided peer group meetings.

A private social media group was created for program participants using a social media app. In this private social media group, participants could share resources, case

advice, and general support. The goal of this app was to provide the ability to maintain a support network of peers to consult on cases and discuss experiences transitioning into practice. This social media group also served as a dissemination tool for educational materials and relevant resources.

Using video chat technology, small group sessions (five to eight participants) were conducted at the end of each module to review the concepts learned in the modules. During this small group meeting, participants were led through a guided reflection with a veterinarian and a licensed therapist on scenarios faced in the previous month in practice related to the topics covered. Mastenbroek et al. (2015) found the reflection process was a key component to the veterinary professional development program, and according to participants, the reflection process increased self-acceptance and self-esteem and improved communication with clients and colleagues. In addition, this time to reflect upon concrete experiences may have been important for improving student learning (Kolb, 1984).

3.2 Population and Recruitment

New veterinary graduates from two Southeast veterinary colleges were invited to participate in this professional development program. The program was offered to approximately 200 new graduate veterinarians. A non-randomized convenience sample was used due to time and funding limitations, and the difficult nature of gaining access to an entire population of graduating veterinary students—especially during the COVID-19 pandemic. A waitlist control group of newly graduated veterinarians was obtained from two other U.S. veterinary colleges. The recruitment email for the waitlist control group was sent to approximately 200 new graduate veterinarians. These participants were offered access to the program materials after the final survey was completed.

Study participants were recruited by contacting gatekeepers (administrative leadership) within the four veterinary colleges. Recruitment emails were forwarded by these gatekeepers to the graduating veterinary students at these four colleges. Individuals interested in participating in the study were asked to complete a pre-screening questionnaire to express their interest in the study. If individuals met the inclusion criteria

of the study (veterinary student graduating in 2020), they were sent information on how to sign up for the study. Written informed consent was obtained from all study participants, and IRB approval was obtained through the University of Kentucky.

3.3 Research Design

This study used a mixed methods explanatory sequential design. Mixed methods studies use both quantitative and qualitative data to evaluate research hypotheses. This approach has been used since the late 1980s and early 1990s in health sciences, evaluation, sociology, and other fields and has continued to develop since then (Creswell & Creswell, 2018). This method was chosen because it improves the strength of the research findings by combining both quantitative and qualitative data and allows for a more detailed evaluation of the professional development program. First, quantitative survey data was gathered then qualitative focus group data was gathered to help explain the quantitative results in more depth and detail.

A quasi-experimental design was used in this study. A nonequivalent pretest-posttest control-group design was used where the experimental group and the control group were selected without random assignment. The experimental group participated in the professional development program. Both program participants and the control group participants completed a pretest and posttest questionnaire with questions regarding stress, burnout, social support, and well-being. The results from both groups were compared to assess the relationship between program participation and these variables. The program participants' posttest also included a retrospective analysis of learning objectives to evaluate program effectiveness. In addition, pretest and posttest data were collected from participants during each learning module regarding aspects of knowledge gained in the program. Following the collection of the questionnaire data, all program participants were invited to participate in a qualitative online focus group to gather more detailed and descriptive data regarding the program experience.

A curriculum review was conducted to evaluate differences and similarities in professional skills curriculum for the participants in this study who graduated from four different veterinary colleges. This information was used to compare the curriculum of the

different veterinary schools to ensure that amount of training was not a confounding variable for the outcome of the study.

3.4 Research Instruments

The pre and post questionnaire for control participants and program participants included measures of demographics, a stress scale, a well-being scale, a burnout scale, and a social support scale. The post-program questionnaire for program participants also included a retrospective analysis of learning objectives and other program evaluation questions. Pretests and posttests for aspects of knowledge were incorporated into learning modules.

Demographics

Questions were asked regarding gender, age, marital status, household income, level of student debt, employment status (ex. full-time, part-time), veterinary practice type, number of other veterinarians in the practice, and types of professional skills electives taken during the veterinary curriculum.

Stress

The Perceived Stress Scale (PSS) was used which is a 10-item scale that assesses the degree to which situations are perceived as stressful (Cohen et al., 1983). This scale uses a 5-point Likert scale ranging from 0 (never) to 4 (very often) to assess how frequently participants encountered stressful situations in the last month. Examples of the PSS items included "In the last month, how often have you been upset because of something that happened unexpectedly?" and "In the last month, how often have you been angered because of things that were outside your control?" The internal consistency of this scale has been shown to be high with Cronbach's alpha of between .84-.86 across three different populations (Cohen et al., 1983).

Well-being

The Warwick-Edinburgh Mental Well-being Scale (WEMWBS) was used in this study to assess mental well-being (Stewart-Brown & Janmohamed, 2008). This is a 14-item scale that includes all positively worded questions to assess positive mental health. It was scored using a 5-point Likert scale ranging from 1 (none of the time) to 5 (all of the

time). Examples of WEMWBS items included “I’ve been feeling confident” and “I’ve been feeling optimistic about the future”. The scale was scored by adding the numerical responses to each item. This scale showed excellent reliability in a large group of U.K. veterinarians with a Cronbach’s alpha of .94 (Bartram et al., 2009).

Burnout

The Maslach Burnout Inventory General Survey (MBI-GS) was used to assess three components of burnout in the workplace: exhaustion, cynicism, and professional efficacy (Maslach et al., 2018). This is a 16-item scale that uses a 7-point Likert scale ranging from 0 (never) to 6 (every day) to assess the self-reported frequency of burnout. Examples of items on the MBI-GS included “I feel emotionally drained from my work” and “I doubt the significance of my work”. Internal consistency Cronbach’s alpha values ranged from .7-.9 for exhaustion, cynicism, and professional efficacy (Leiter & Schaufeli, 1996).

Social Support

The Medical Outcome Study (MOS) Social Support Survey is a validated instrument used to measure overall functional social support (Sherbourne & Stewart, 1991). For the current study, the emotional/informational support 8-item subscale was used to assess the levels of emotional/information support of participants. This scale uses a 5-point Likert scale ranging from 1 (none of the time) to 5 (all of the time) to assess how often social support is available. Examples of items on the emotional/informational support subscale were “someone to give you information to help you understand a situation” and “someone who understands your problems”. The Cronbach’s alpha for the emotional/informational support subscale was .96 showing a very high internal consistency (Sherbourne & Stewart, 1991).

Program Evaluation

A retrospective analysis of learning objectives was used to assess the effectiveness of the program in satisfying learning objectives. After participating in the program, participants were asked to rank their level of ability in various abilities associated with the learning objectives within the modules before and after the program. An example of one of the questions asked was “Please estimate your level of ability by selecting a choice for each comment: Before This Program - Identifying your current self-care practices and how

they can be improved." The scale used a 5-point Likert scale ranging from 1 (poor) to 5 (excellent).

In addition, pretests and posttests were administered in the learning modules to assess knowledge gained. Each quiz had a total possible score of 10 points. Additional program evaluation questions were asked on the post-program questionnaire to evaluate the overall perception of the program and effectiveness of the presenters, online content, and social media app.

Curriculum Review

Curriculum data was evaluated by analyzing syllabi, course catalogs, and veterinary school websites. Additional data was gathered through personal communication with veterinary school faculty members and leadership. Data gathered included required professional skills courses for veterinary students. Professional skills were defined as non-technical skills including communication, team building, ethics, business, practice management, well-being, self-care, or conflict management. Course names, descriptions, credit hours, and methods of delivery of instruction were gathered and analyzed.

3.5 Procedure for Data Collection

Phase 1

Figure 3.1 provides a visual representation of the data collection timeline. Questionnaire responses for the above measures were collected online through Qualtrics 2 weeks prior to the implementation of the professional development program from the control group and program participants. Pretests and posttests within the learning modules were administered, and data was gathered using the learning management system. A second survey was performed 3 weeks after the completion of the program from these same populations using Qualtrics. During Phase 1, information was also collected through email communication regarding the required veterinary curriculum relating to professional skills training.

Phase 2

Four weeks after the completion of the program, a semi-structured qualitative focus group was performed. Qualitative focus group questions were developed after initial

analysis of the quantitative data and included questions to measure the overall impact of the program on participants. Example prompts included, "Can you tell me about your overall experience participating in this program?" and "What impact, if any, has this training had on your career?" The 90-minute focus group was conducted virtually, and the audio from the focus group was recorded so the focus groups could be transcribed and analyzed.

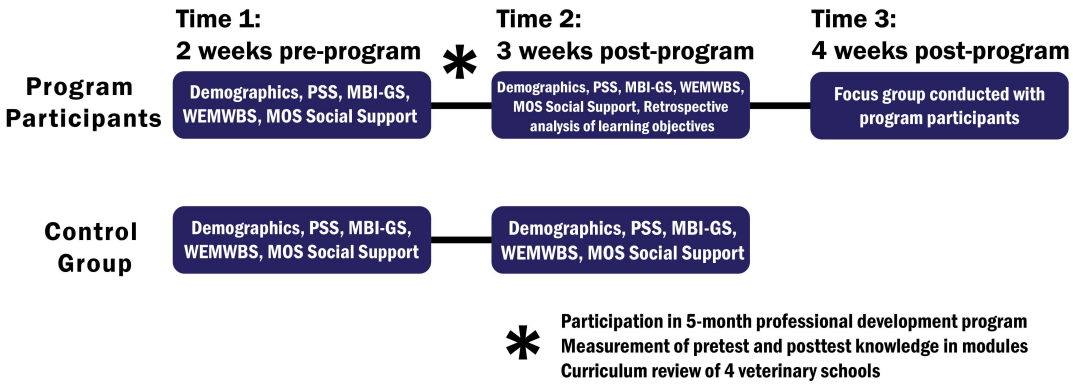

Figure 3.1 Data Collection Timeline

3.6 Data Analysis and Interpretation

Phase 1

Descriptive statistics were used to analyze the questionnaire data. Statistical significance was defined as obtaining a p-value of less than 0.05. Prior to the program, no differences were expected between the groups in demographic measures or levels of stress, burnout, social support, and well-being, so two-tailed independent sample t-tests were used to ensure there were no significant differences between the groups in these measures.

An independent sample one-tailed t-test was used to determine if program participants' post-program means were significantly different in the anticipated direction from the control group's means in the measures of stress, burnout, social support, and well-being. Also, two-tailed independent sample t-tests were used to detect if there were any significant changes over time in the levels of stress, burnout, well-being, or social support

for the control group or the intervention group. A paired test was not used because several participants in the control group did not complete the second survey and identifiers were not retained on the pre-program and post-program surveys.

A one-tailed t-test was used to compare mean stress scores of all participants in the study to a known mean stress score of a similarly aged cohort of individuals within the general population to assess if stress scores are higher for new veterinary graduates compared to a normative population. In addition, one-tailed t-tests were used to compare the mean well-being and burnout levels of all program participants to normative population means in the anticipated direction based on previous research findings.

For each module, a quiz was administered before and after the module to test for knowledge gained. For each module, a one-tailed paired t-test was performed to evaluate if mean test scores improved after completion of the module. In addition, the retrospective pre-post analysis of learning objectives was analyzed for improvements in abilities associated with learning objectives using a one-tailed paired t-test.

Phase 2

Transcriptions of qualitative focus group data were analyzed and coded for themes relevant to the current research study. Qualitative codes are "essence-capturing and essential elements of the research story that, when clustered together according to similarity and regularity (i.e., a pattern), actively facilitate the development of categories and thus analysis of their connections" (Saldaña, 2016). First cycle eclectic coding was used which intentionally combines several first cycle coding methods to best fit the data, and in this study, In Vivo coding and descriptive coding methods were used. In Vivo coding uses quotes from the participants' own words and phrases to create codes. These codes are "more likely to capture the meanings inherent in people's experience" (Stringer, 2014, p. 140) because they use the exact words or phrases used by the participants. During second cycle coding, the frequent and significant codes were categorized to create themes using focused coding. The final narrative will be presented using code weaving to provide detailed data on the program experience.

3.7 Limitations of Study

One major limitation of the current study was the use of convenience sampling for the participants of the program. Because participants in the program were only selected from two veterinary schools instead of a randomized sample from all veterinary schools, the results may be difficult to be generalized to the entire population of recent veterinary graduates. Also, by comparing the convenience sample from two veterinary schools to a control group from other veterinary schools, results seen may not only be a result of program participation but may also be a result of other confounding variables (e.g., the preparedness of new graduates due to the curriculum design and training received at the specific veterinary schools).

For example, if program participants were required to complete more self-care training during veterinary school than the participants in the control group, program participants may have lower levels of stress because they have been better prepared in self-care. Convenience sampling was necessary for the current study because of the difficulty in accessing the population of graduating veterinary students at multiple veterinary schools. Also, the program aimed to connect an entire cohort of veterinary students who were already acquainted with one another to strengthen the social support provided within the program. To decrease the effect of this limitation on the results, the required non-clinical skills curriculum of all veterinary schools was assessed to determine if there were any major differences in the required curriculum that may confound the results.

Another limitation of this study was the small sample size. Because this was a pilot study, a relatively small sample of program participants was used. The small scale of this study could lead to difficulties in obtaining statistically significant results. Also, it may limit the generalizability of the study to the entire population of new veterinary graduates. Because the sample size was small and to gather the most comprehensive data, qualitative focus group data was gathered to help provide support and explanation for the quantitative data.

Participants self-selected to be in the study. This could introduce inherent bias because the individuals who are seeking resources such as the program offered may be more likely to experience higher levels of stress and burnout and lower levels of well-being than a random sample of the general population of new veterinary graduates. A final

limitation of this study was the use of self-reported questionnaires to measure stress, well-being, and burnout. Because these measures were self-reported, participants may have exaggerated or not given a true answer to these questions. This may have led to falsely high or low numbers due to the self-reported nature of the questionnaires.

CHAPTER 4. RESULTS

4.1 Demographics

A total of 38 new veterinary graduates participated in the study. The participants ranged in age from 25 to 35 with a mean age of 27.16. An overwhelming majority of the participants were female (92.1%) and only three participants were male (7.9%). Most participants (89.5%) identified as White, one participant identified as Black or African American (2.6%), one participant identified as Hispanic or Latino (2.6%), one participant identified as Asian and White (2.6%), and one participant identified as American Indian or Alaska Native and White (2.6%). Most participants were single (76.3%) and a smaller proportion of participants were married (23.7%).

Participants represented graduates from predominantly four veterinary colleges. One participant in the waitlist control group completed their clinical rotations at one of these four veterinary colleges and completed the first 3 years of training at an international veterinary college. Veterinarians reported working in a wide range of practice types including small animal, equine, mixed animal, research, internship or residency, and large animal, and the majority of the participants reported that they were working in a small animal practice (52.6%).

Seven participants were in the group that received the intervention and 31 participants were in the waitlist control group. As the invitation to participate in the study was sent to approximately 400 new graduate veterinarians, it is estimated that the response rate in this study was less than 10%. The race and ethnicity, gender, marital status, and mean age of these two groups were not significantly different. All seven veterinarians who self-selected to participate in the intervention group responded to the first survey (response rate of 100%), and all 31 participants who self-selected to participate in the waitlist control group responded to the first survey (response rate of 100%). For the second survey, all seven participants in the intervention group responded (response rate of 100%) and 25 of the 31 participants in the waitlist control group responded (response rate of 80.6%).

4.2 Curriculum Review

School 1

Four out of seven participants in the intervention group attended School 1. School 1 required that students take a one credit hour course every semester for the first six semesters of the curriculum in professional skills training. This was primarily lecture-based training in communication, leadership, business management, stress management, and ethical decision making. A two credit hour course offered prior to entering clinical rotations discussed practice management topics, jurisprudence, and veterinary ethics and was also primarily didactic.

Three out of four of the participants graduating from School 1 reported participating in additional training in non-technical skills (e.g. seminars in non-technical skills such as self-care, business, leadership, and communication).

School 2

Three out of seven participants in the intervention group attended School 2. School 2 required veterinary students to take a one credit hour professional skills course every semester for the first six semesters. These courses incorporated simulated client interactions and were primarily laboratory hours. One credit hour equated to 15 to 30 hours of laboratory experience in these professional skills courses. Additional topics in these courses included communication skills, imposter syndrome, perfectionism, diversity, leadership, financial literacy, and emotional intelligence. A one credit hour didactic course was offered in the third semester of the veterinary curriculum covering practice management and business topics.

One out of 3 of the participants who graduated from School 2 reported additional training (a diversity certificate) outside of the required curriculum.

School 3

Twenty-one out of 31 waitlist control group participants attended School 3. In the first semester of the School 3 veterinary curriculum, veterinary students took the one-half credit hour Health, History, and Physical Exam course which incorporated some communications training. During the first six semesters of training, veterinary students took a 0.17 credit hour course in veterinary medical ethics that was primarily didactic with some discussion. During the third semester of training, veterinary students were required

to take a zero credit hour course, Introduction to the Veterinary Teaching Hospital, where students had 4 hours of communication training in the four core communication skills with role-play and discussion. In the sixth semester of training, veterinary students took a 1 hour professional skills course that included didactic training on business, team conflict, and legal issues. In the final year of training, there were weekly communication rounds in the two credit hour primary care course.

Eight out of 21 participants that graduated from School 3 reported participating in electives at their veterinary school that focused on non-technical skills training (e.g. Healer's Art, Beginning and Advanced Communication, Stress and Resilience). Five of the participants reported additional training in non-technical skills (e.g. ethics training, leadership skills, Veterinary Leadership Experience, serving in a leadership role).

School 4

Nine out of 31 of the participants in the waitlist control group attended School 4. School 4 required a one credit hour clinical correlates course in the first four semesters of training which included some communication training. During the sixth semester of training, veterinary students were required to take the two credit hour Veterinary Practice: Legal, Ethical, and Managerial course which included didactic training in business, legal issues, practice management, and ethics.

Four out of nine of the participants who graduated from School 4 reported participating in suicide prevention training. Five of the participants graduating from School 4 reported additional training or attended optional seminars in non-technical skills training (e.g. ethics training, cultural competency, practice management, business training, communications).

4.3 Stress

On the baseline pre-program questionnaire, the mean stress level of all new graduate veterinarians in the study as measured by the Perceived Stress Scale (Cohen et al., 1983) was 19.63 (SD = 6.56). The mean stress level of new veterinary graduates was found to be significantly higher ($t = 1.94$, $p = .029$) than the mean stress level of a similarly

aged cohort of the U.S. general population (n = 433, M = 17.46, SD = 7.31) (Cohen & Janicki-Deverts, 2012).

At baseline prior to the program, the mean stress level of the participants in the intervention group (n = 7, M = 22.57, SD = 9.02) was higher than the mean stress level of participants in the waitlist control group (n = 31, M = 18.97, SD = 5.86), though the difference in means was not significant. For the second survey, 3 weeks after the end of the 5-month intervention, the mean stress level of participants in the experimental group had decreased since the first survey (n = 7, M = 17.86, SD = 5.79); whereas, the mean stress level of participants in the waitlist control group had increased (n = 25, M = 20.24, SD = 6.65). After participating in the intervention, the mean stress level of participants in the experimental group was lower than the mean stress level of participants in the waitlist control group, though the difference was not statistically significant. Figure 4.1 provides a graphical representation of the mean stress levels of participants.

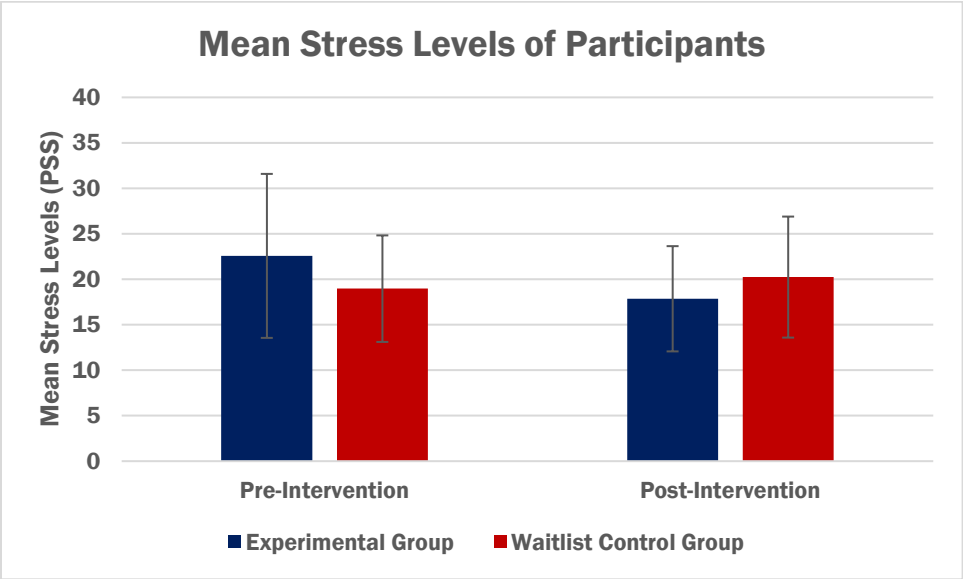

Figure 4.1 Mean Stress Levels of Participants

4.4 Well-being

The well-being of participants was measured using the WEMWBS. The first survey which measured baseline well-being levels prior to the intervention found that the mean

well-being score of all participants was 44.32 (SD = 9.82) which was significantly lower (t = -2.82, p = .004) than the mean well-being score of a large sample of veterinarians from the United Kingdom (Bartram et al., 2011).

The participants in the intervention group, before participating in the professional development program, had a lower mean level of well-being (M = 38.14, SD = 12.06) than individuals in the waitlist control group (M = 45.71, SD = 8.89). After participating in the professional development program, the mean well-being score increased for participants in the intervention group (M = 46.43, SD = 11.39); whereas, the mean well-being level for those in the waitlist control group decreased (M = 42.32, SD = 9.68). After the intervention, the mean well-being score of the participants in the intervention group was higher than the mean well-being score of participants in the waitlist control group, though this difference was not found to be statistically significant. Figure 4.2 provides a graphical representation of the mean well-being scores of all participants within the study.

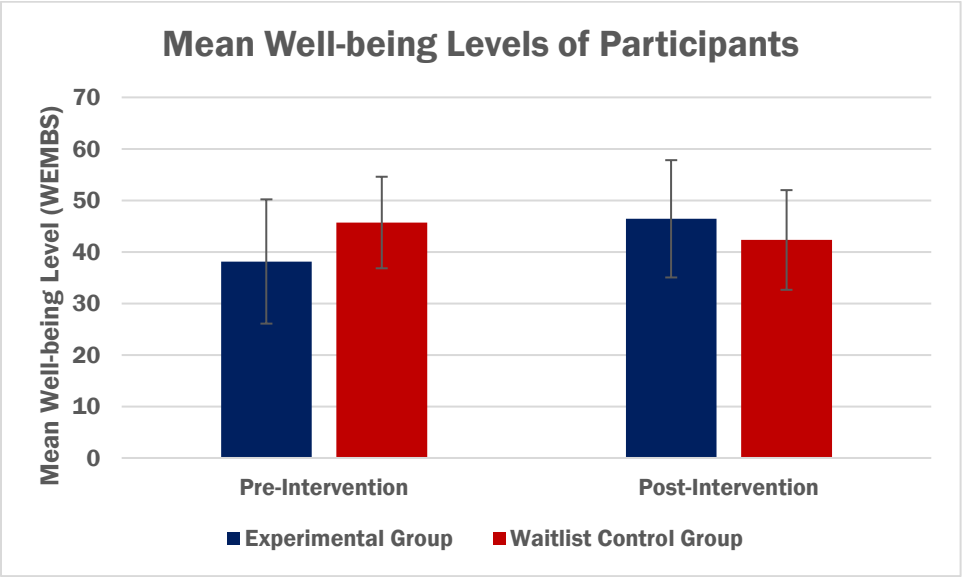

Figure 4.2 Mean Well-being Levels of Participants

4.5 Burnout

Exhaustion

The mean exhaustion level for all participants before the intervention was 2.99 (SD = 1.52) which was significantly higher (t = 2.96, p = .003) than the mean exhaustion level of a large sample of the general population (n = 47,800) (Maslach et al., 2018). A mean level of 2.99 on this subscale suggested that the new graduates were feeling exhausted a few times per month on average shortly after graduation from veterinary school.

Prior to the intervention, the mean level of the exhaustion, a measure of burnout, for new graduates in the intervention group was 3.4 (SD = 1.91) which was higher than the mean level of exhaustion for new graduates in the waitlist control group (M = 2.90, SD = 1.44). After the intervention, the mean level of exhaustion for new graduates in the intervention group slightly decreased to 3.06 (SD = 1.75). This is in contrast to the change seen over time in the mean level of exhaustion for new graduates in the waitlist control group (M = 4.4, SD = 1.24) which had increased significantly over time by 1.5 points (t = 4.17, p = .0001).

After the intervention, the mean level of the exhaustion component of burnout was significantly lower for the veterinarians in the intervention group as compared to the waitlist control group with a difference in means of -1.34 (t = -1.90, p = .048). Figure 4.3 provides a graphical representation of the mean exhaustion scores of study participants over time.

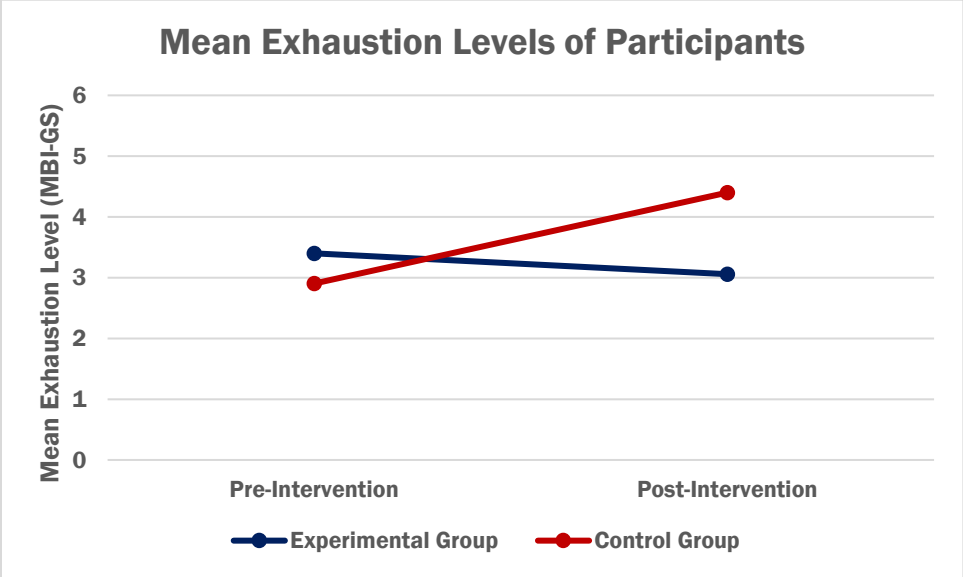

Figure 4.3 Mean Exhaustion Levels of Participants

Cynicism

At baseline before the intervention, the mean level of cynicism for all participants in the study was 2.13 (SD = 1.66) which was not significantly different when compared to a large sample of the general population (Maslach et al., 2018). A mean level of 2.13 on the cynicism scale suggested that participants felt cynical about their work around once a month.

The mean level of cynicism before the professional development program for veterinarians in the intervention group (M = 2.8, SD = 2.14) was higher than the mean cynicism level of veterinarians in the waitlist control group (M = 1.97, SD = 1.54). After the intervention, the mean cynicism level of veterinarians who participated in the intervention had decreased slightly over time (M = 2.43, SD = 1.81); whereas, the mean cynicism level of the veterinarians in the waitlist control group (M = 2.89, SD = 1.48) significantly increased over time ($t = 2.26$, $p = .028$). Post-intervention, the mean cynicism score was slightly lower for the veterinarians in the intervention group than those in the control group, though this difference was not found to be statistically significant. Figure 4.4 provides a graphical representation of the mean cynicism levels of study participants over time.

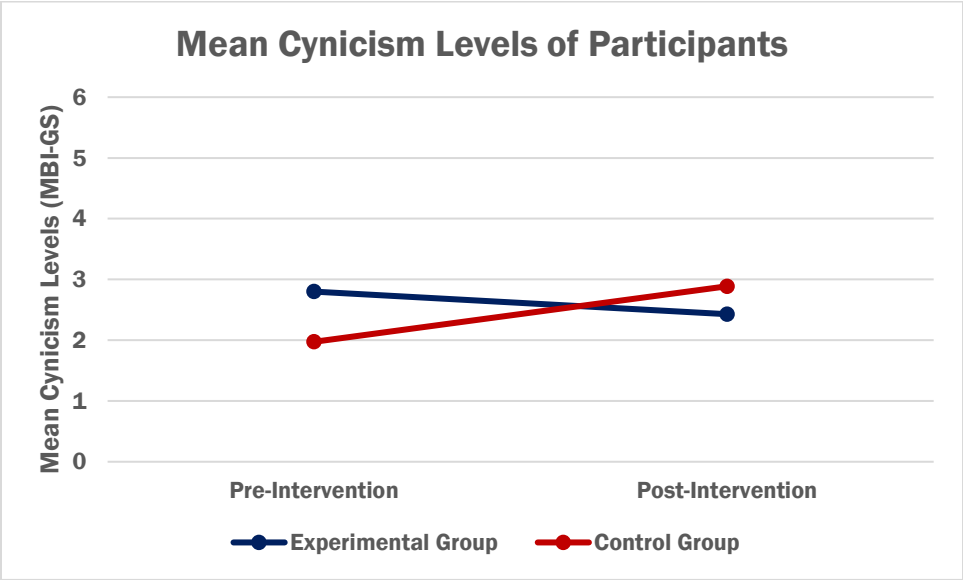

Figure 4.4 Mean Cynicism Levels of Participants

Professional Efficacy

Among all participants in the study before the intervention, the mean level of professional efficacy was 3.92 (SD = 1.50) which was significantly lower (t = -1.73, p = .046) than the mean professional efficacy of a large sample of the general population (Maslach et al., 2018). With a mean level of 3.92 on the professional efficacy scale, participants felt effective in their work around once per week.

Before the intervention, the mean professional efficacy of new graduates in the intervention group (M = 3.38, SD = 1.56) was lower than the mean professional efficacy of new graduates in the waitlist control group (M = 4.04, SD = 1.49) though this difference was not statistically significant. After the intervention, the mean professional efficacy of both groups increased. The mean professional efficacy of veterinarians in the waitlist control group (M = 4.27, SD = 1.23) was higher than the mean professional efficacy of veterinarians in the experimental group (M = 3.88, SD = 1.84) post-intervention, but this difference was not statistically significant. Figure 4.4 provides a graphical representation of the mean professional efficacy levels of study participants over time.

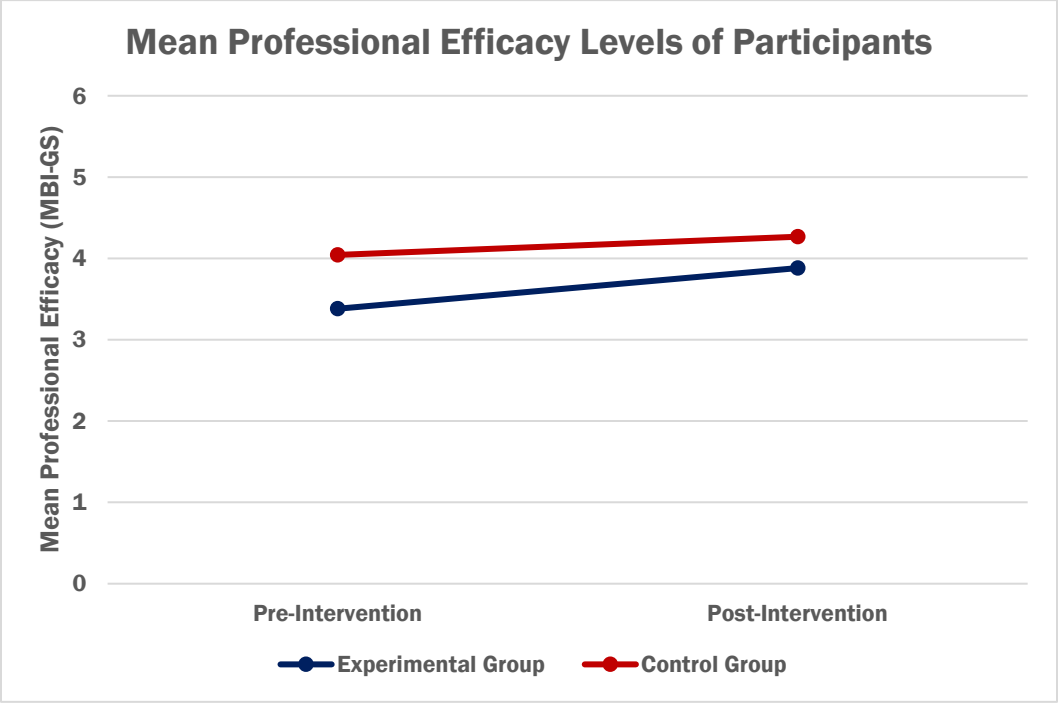

Figure 4.5 Mean Professional Efficacy Levels of Participants

4.6 Social Support

For the pre-intervention baseline measurement, the mean level of social support for veterinarians in the intervention group (M = 3.64, SD = 1.21) was not significantly different than the mean level of social support for veterinarians in the waitlist control group (M = 3.71, SD = 0.91). After the professional development program, the mean level of social support for veterinarians in the intervention group (M = 3.88, SD = 1.10) had increased slightly over time, and the mean social support level of veterinarians in the waitlist control group remained relatively unchanged over time (M = 3.64, SD = 0.90). In addition, after the intervention, the mean level of social support for veterinarians in the intervention group was slightly higher than the mean social support level of the veterinarians in the waitlist control group.

4.7 Program Evaluation

Pretest and Posttest Module Quizzes

For all modules, the mean test score was higher on the posttest than the pretest. In four out of five of the learning modules, program participants had statistically significant increases in mean test scores from pretest to posttest. For the self-care module, the mean score increased by 1.63 points (p = .027); for the leadership module, the mean score increased by 2.00 points (p = .061); for the conflict module, the mean score increased by 4.43 points (p = .001); for the ethics module, the mean score increased by 5 points (p < .001); and for the incremental care module, the mean score increased by 6.43 (p < .001). See Figure 4.6 for graphical representation of mean pretest and posttest scores.

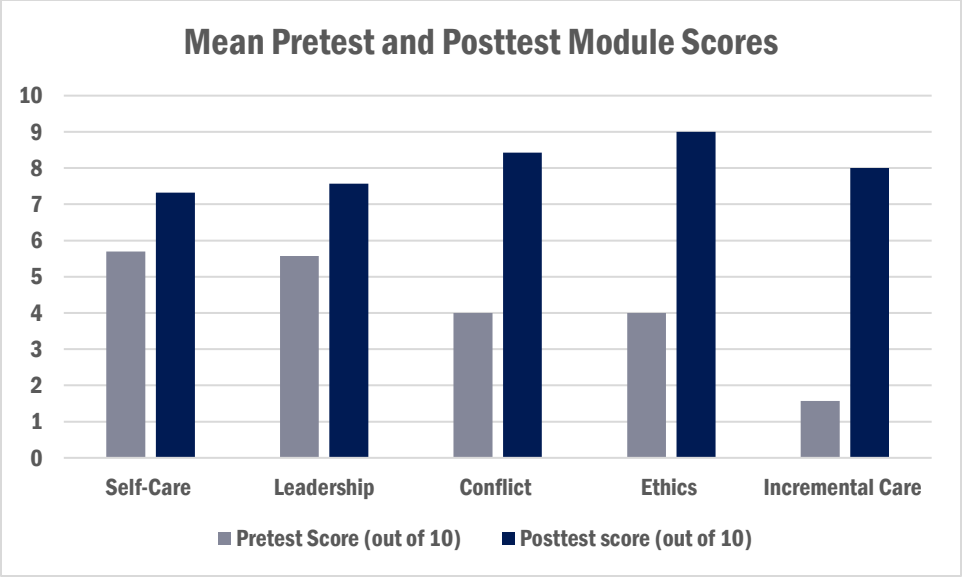

Figure 4.6 Mean Pretest and Posttest Module Scores

Retrospective Analysis of Learning Objectives

The mean score for all 20 self-reported abilities associated with the learning objectives increased after the program ($p < .05$). Most mean scores for perceived abilities after the program were around one to one and one-half points higher than perceived abilities before the program. The learning objectives that had the largest improvement in mean self-reported abilities were "Discussing the steps to take after making a mistake in practice" and "Providing care to animals given limited financial resources".

Online Content

Six out of seven program participants (85.7%) rated the online content as excellent in the following statements: was well organized and was easy to understand. Furthermore, five out of seven program participants (71.4%) rated the online content as excellent in the following statements: was relevant to my needs, was based on up-to-date information, was clearly presented, contained assignments that were useful, and was interactive and engaging.

The Presenters

All seven program participants (100%) rated the presenters as excellent in the following statements: knowledgeable about the subject matter, engaged the participants in learning, and related program content to practical situations. Six out of seven program participants (85.7%) rated the presenters as excellent in the following statements: were well

prepared, used appropriate teaching/facilitation methods, and answered questions clearly and accurately.

Social Media App

The social media app was used to a varying degree by program participants. One participant reported using the social media app more than three times per month, three participants reported that they used the app twice per month, two participants reported that they used the app once per month, and one participant reported never using the social media app. The majority of program participants who used the social media app indicated that the ease of use was good or excellent. The app was rated as good or average by five out of six participants in the usefulness to connect with others and providing helpful resources.

Monthly Reflection Sessions

All seven program participants (100%) rated the monthly reflection sessions as excellent in the following statements: were well organized, were useful to connect with others, and were beneficial for learning. Six out of seven program participants (85.7%) rated the monthly reflection sessions as excellent in being interactive and engaging. Regarding the statement "helped me apply the concepts from the online modules", five participants rated the monthly reflection sessions as excellent and two of the participants rated the sessions as good.

Other Program Evaluation Questions

When inquiring about the overall satisfaction of the program, four participants were very satisfied (57.1%), two participants were satisfied (28.6%), and one participant was neither satisfied nor dissatisfied (14.3%). When asked about the extent that participants felt they could use the knowledge and skills learned in the program, three participants indicated a great deal (42.9%), two participants indicated a lot (28.6%), one participant indicated a moderate amount (14.3%), and one participant indicated a little (14.3%).

Participants were asked to what extent they agreed with the following statements. For the statement "I would highly recommend this program to other new veterinary graduates", four participants strongly agreed (57.1%), two participants agreed (28.6%), and one participant somewhat agreed (14.3%). For the statement "Participation in this program helped me feel supported in the transition from student to veterinarian", five participants strongly agreed (71.4%) and two participants somewhat agreed (28.6%). For the statement

"Participation in this program made it easier for me to connect to other new veterinary graduates", four participants strongly agreed (57.1%), two participants agreed (28.6%), and one participant neither agreed nor disagreed (14.3%).

When asked to share any additional comments and feedback, one participant indicated that the program was "very helpful in maintaining my sanity and transitioning to a new part of my life and career". One participant mentioned that it could be helpful to include content regarding providing veterinary care in the era of COVID-19. Two participants mentioned that they particularly enjoyed being able to stay connected to other new veterinary graduates. This sentiment was portrayed by one participant's comment:

> I wish every new veterinary graduate could take part in this seminar series/workshops. It is great to be connected with new grads I know and don't know and have a safe space to learn, communicate, share frustrations, and grow. This program was both practical and meaningful.

One participant recounted that the program played a vital role in helping her stay in the profession:

> I was thrown into practice. I was promised a job with training and mentorship . . . the staff was poorly trained, the caseload was daunting, and on top of everything, there was a global pandemic. It was a terrible year to start my career. But, with [program director's name]'s help and mentorship, I am so much further now than I was in May. I am still learning how to doctor, the way I feel most comfortable practicing medicine, and how to be a leader, but the guidance her and her program has given me was instrumental in keeping me in vet med. . . . her program helped to answer many of the questions I had. I don't know where I would be right now without her or this program, but I may not have continued in the field without them.

4.8 Focus Group

All veterinarians who participated in the professional development program were invited to attend a 90-minute focus group to discuss their experiences in the program. Of the seven veterinarians that participated in the program, five self-selected to participate in

the focus group. Pseudonyms are used to protect the confidentiality of program participants.

Two major categories of themes arose during the focus group *experiences in the program* and *skills and knowledge*. Three themes arose that were grouped into the category of *experiences in the program* including applicability & integration, the support network, and areas for improvement. Five themes arose that fell into the category of *skills and knowledge* including self-awareness, self-care, communication skills, decision making, and a new language.

Experiences in the Program

Applicability & Integration. All veterinarians in the focus group discussed that the material learned in the program was applicable to their careers. The veterinarians discuss multiple scenarios in which they were able to apply the knowledge learned in the program. Alice shared that she had "a Deaf client come in . . . literally the stuff we talked about in like the culture awareness section actually ended up kind of coming in handy." Even Mary, a veterinarian pursuing advanced research training, was able to apply what she had learned in the program sharing,

> It's very applicable, and it's really nice to have a group to come to every month where you learn something, can apply it, it actually fits in with your everyday life. . . . I'm not in practice, but I still use things I learned in these modules every single day.

Julie also mentioned that she is able to use the material that she learned from the program daily:

> I had like the incremental care that came up, and I was like okay you know this person can't afford a dental for their cat. What can I offer them now? So, every day I do bring up one of the modules.

Several veterinarians mentioned that they felt that the material was well integrated, and the modules build on each other. Alice mentioned that "it does all smush together . . . the way it builds on each other like it just does like click in." Bridgette stated,

> I feel like that was one of the cool things about focusing on one thing every month is that I feel like now I have this blend of information, and I can't quite parse which one came from which, but I use at least one of them every day.

In addition, a few new graduates mentioned that they enjoyed the combination of social work and veterinary perspectives during the program. Bridgette thought that the social work concepts that were covered during the program were "well-integrated" and "applicable to specifically us in vet med".

The Support Network. One aim of the program was to establish a support network for new veterinary graduates. The support offered by the program was considered helpful to many of the new graduates. Alice described it as her "mandatory support network" and shared that the monthly meetings had been "invaluable". Mary thought that participation in the program "expanded the support network" sharing, "I think it opened up that network to people in the same boat that we wouldn't have necessarily reached out to before." She also mentioned how instrumental the support network was during the COVID-19 pandemic sharing that the program "has created kind of a weird little community that I don't think would have happened otherwise where we're relying on this more than we normally would be for this contact." Julie mentioned that the program gave her an opportunity to discuss the "bad situations" she was facing in practice which she stated were not often discussed among her other veterinary friends. She also discussed how she, "grew with the community" over time and "felt like I got more comfortable with everyone." A few of the veterinarians mentioned that they enjoyed the diverse perspectives and experiences of the other veterinarians in the group.

The support network developed as a result of the program was described by many of the new graduates as a "safe place" to talk about issues faced at the start of the veterinary career. Lauren shared that she thought the program created a space where "you feel free to talk through your thoughts without having judgment passed on you." All veterinarians mentioned that it was beneficial to hear that others were having similar experiences and that they were "not alone" in their challenges. Lauren shared, "I also felt like it was helpful because you also got the sense that you felt like your feelings weren't unique to you. Like you aren't alone in these thoughts and struggles." Bridgette agreed with Lauren sharing, "I feel like that was the biggest thing for me too is just not feeling alone because especially after vet school all your friends move away and you're very alone." She also mentioned that "I was kind of thrown to the wolves, so if I didn't have something like this, I might have not been in vet med anymore."

Some of the veterinarians mentioned that, because of the program, they were more comfortable talking with other veterinarians about the challenges that they were facing. Alice shared,

> Yeah, it just made me more willing to like reach out . . . to anyone. I mean, I just like having a reassurance that things have been so well . . . received here and now I have like the skills and kind of way to present things better about like my experiences. . . . it's great to have this group, and it really opened up like other opportunities that I had been too nervous to acknowledge before.

Lauren shared a similar story:

> I feel like having these . . . meetings has kind of made me do more self-reflection, feel more comfortable vocalizing my thoughts. I feel like imposter syndrome is always going to be something that I know I will struggle with. And I'm sure every one of you guys will, but there was one instance where . . . we have relief vets that come in through here . . . I look up to her a lot because she thinks very rapidly and is very good at what she does. And I remember feeling comfortable enough to like open up to her one day and just saying, "You know, I'm not . . . feeling there today. I just, I feel like imposter syndrome's really getting me down." And she's like, "It gets you every day. Every day I feel it, every single day, and I've been in here like 15 years. It's normal." So, I think being able to talk about it to people kind of . . . helps me feel more into this community, but I'm still working on it.

While the program was seen as a beneficial support network, several of the new graduates still felt as if they had not quite found their place within the veterinary profession outside of the program. A few of the veterinarians mentioned feelings of imposter syndrome, and a few were still unsure of their place within the profession. Bridgette shared:

> I feel like I still haven't found my place in the vet profession. So, I feel like there's other people out there that I can talk to, but I still don't feel like I found my place in the first place.

A few of the new graduates shared how the COVID-19 pandemic had affected their sense of community and belongingness within the profession. Julie mentioned, "I feel like it's gonna take me a while to feel like I'm actually in it until things get back to normal." Alice shared a similar thought:

> I'm not really sure like, where I am [in the veterinary community] . . . we're missing . . . because of, you know, the virus and everything, we're missing, like all these other opportunities to network. So like I'm feeling like the absence of the access to the broader community. Which has made this group really important, but means that I still don't feel really connected with anyone other than [this group].

Areas for Improvement. The veterinarians shared several thoughts on how the program could be improved in the future. Most of the veterinarians in the focus group stated that they had a desire for the program to last longer than 5 months. One of the veterinarians mentioned that more frequent meetings could also be helpful. A few of the new graduates mentioned that they would enjoy more journal articles, book recommendations, and protocols that they could use in practice. The social media app was discussed as an area for improvement by many of the new graduates. While it was seen by some as a helpful place for finding additional resources, others found that it felt like "shouting into a room" because there were so few in the group and often others would not reply to their post. Some of the new graduates recommended additional veterinarians be added to the group to increase dialogue.

Skills and Knowledge

Self-awareness. All five veterinarians in the focus group mentioned becoming more self-aware during participation in the program. Mary mentioned that she had "increased self-awareness . . . I learned a good bit about myself and how I make decisions and how I approach situations throughout the past few months." This self-awareness was discussed in a wide variety of contexts including self-care practices, biases, and conflict. Mary discussed that she had become more aware of her biases sharing,

> And then I think the biases thing . . . if you're told about it, and we talk about it, we think about it more. But if we aren't talking about it . . . it tends to just kind of fall behind. And those, when we're stressed or tired, those things come to the forefront of our mind because it's the quick easy link our brain can make. So, having that extra awareness has been helpful.

The veterinarians also mentioned that this self-awareness had helped them reflect upon their leadership styles and professional identity. Bridgette discussed how "recently, I have started trying to figure out what kind of leader I would want to lead me and try to be

that leader for the team." Lauren discussed reflecting on her professional identity as a result of the leadership module sharing:

> I feel like I want . . . an answer immediately and I, when we went through that [the leadership module], it made me realize that I need to change my mindset from like the school top tier testing . . . I just felt like I needed to run all these tests to figure out exactly what it is rather than be comfortable with not knowing what it is and knowing that I'm still treating for the patient, making the patient feel better.

Self-care. Four out of five of the focus group participants mentioned self-care as an important skill honed during the program. A few participants mentioned how they had made self-care a higher priority in their life because of the program. Julie echoed this sentiment when she stated she is "trying to do better, trying to get you know the exercise in and meditation and making sure I take time for myself." Lauren also mentioned that she has been trying to meditate more frequently and wants to continue incorporating "self-grounding exercises" into her routine. Mary stated that the self-care module was her favorite module stating:

> I'm bad at it like when it comes to everything I have to do in a day, taking care of myself goes to the end of the list absolutely every time. And that module really made me stop and think about when I don't take care of myself, I can't really take care of everything else on that list.

The self-care module helped individuals learn various techniques to practice self-care and may have also had an effect on their overall mental health. Lauren mentioned that the program helped her learn different ways to ensure that she was caring for herself and even discussed trying to decrease perfectionism by "reminding yourself that you're not in control of everything and you have to learn to be okay with that." Two of the veterinarians mentioned that they thought the program had helped protect them from experiencing burnout early in their careers. Julie shared:

> It stopped me from having burnout early . . . I have a really supportive staff, but there's definitely like cases and times where . . . I want to break down but like everything I learned, like the ethical choices, the self-care routines, the incremental care, each one of those came up in a case.

Communication Skills. Communication skills were discussed by four out of five of the veterinarians in the focus group. Many of the veterinarians mentioned that their confidence in their communication skills had improved. The improvement in communication skills may have directly impacted client education and patient care. Two of the veterinarians mentioned that they were trying to be more empathetic. Bridgette mentioned that because of the program she "was able to kind of understand where other people are coming from a little bit more because I think about it in that way." She also shared that she has been better able to "explain to owners why I want to do a diagnostic test. . . I didn't really think about it before in that way, but I'm able to explain it better now." Lauren mentioned that as a direct result of the material she had learned in the program, clients were adhering more to her recommendations. She shared,

> There was one part in the incremental care where you made an emphasis on like explaining why you want specific diagnostic tests to the owners, and I've kind of like made a point to focus on doing that more and my . . . manager said that clients will agree to more things to me than other doctors just because I guess I spend more time explaining why I want it. Which . . . was a boost in confidence because I'm a baby doc and they're all like, years and years of experience.

Three of the veterinarians mentioned that they felt more comfortable communicating with others in times of conflict. Alice mentioned that she had become less "freaked out" when approaching conflict and also shared, "I'm really a conflict avoider . . . like coworker conflict and I didn't really know what to do with it. I definitely feel like a lot more prepared to like address it." Bridgette also shared that she felt more comfortable navigating conflict as a direct result of the program:

> And I had a situation at work that I had a very similar situation when I first started working, and I conflict avoided that one. But this one, I decided to step into the conflict, and I don't know if I necessarily would have made that choice before.

Decision Making. All of the new graduates discussed how the material learned in the program impacted their decision making. Alice stated that because of the program, she was able to learn additional techniques for making ethical decisions. A few of the new graduates discussed how the program helped improve their critical thinking during the decision-making process. Lauren shared that she would definitely recommend the program

to other new graduates because the program "teaches you to think a little bit more critically about everything." Julie mentioned that, because of what she had learned in the program when working through a case, "you know I sat there and like actually took my time and thought through it instead of like panicking." Mary shared a similar sentiment:

> I approach everyday situations, a little differently and a little more holistically. So, when I'm presented with something where normally I may jump to a conclusion or just do it the way I've always done it, I kind of step back, and I see myself thinking about the things that we've learned here and at least trying to apply them.

Three out of the five veterinarians in the focus group mentioned incremental care which is a framework for developing treatment plans for owners who have financial limitations. Both Bridgette and Julie shared that they had become more confident in developing tiered options for owners who are unable to afford gold-standard treatment:

> I think I've also kind of grown with incremental care as well. Definitely. Kind of take time to think, okay, like when they say we can't afford blood work, I actually say, okay, what would I, you know, really, really get from blood work that I could possibly do with another test and still, you know, find close to the right answer. So, it's nice to able to . . . [when] we don't go with Plan A but at least we get some, you know, hope for the animal and owner doesn't go completely empty.

A New Language. Some of the new veterinary graduates reported that the program provided them with a new vocabulary that allowed them to "put a name" to what they were experiencing or how they were practicing medicine. One veterinarian mentioned how this expanded vocabulary made it easier to discuss challenges she was facing. Mary discussed feelings of imposter syndrome:

> I think it's kind of opened me up to talking about it more . . . I'm still trying to figure out why I'm even here . . . doing what I'm doing but being able to talk about it, kind of having some vocabulary behind it, to go at these conversations . . . that I normally wouldn't have. I think it opens me up to having those conversations more which is awesome.

The new vocabulary was seen in a light that made the material easier to implement and was also validating. Alice mentioned that having "facts and the real words for it was really

helpful and like makes everything easier to implement." Brigette discussed her use of incremental care in practice:

> I always had this urge to work with the owners and figure out what we could do, but we didn't necessarily learn about that in vet school and it's, it's definitely something to think about. And I love that there's a word for it that I know now because I didn't know what it was before.

CHAPTER 5. DISCUSSION

5.1 Introduction

Young veterinarians have shown high levels of stress and burnout and low levels of well-being, and the transition to practice seems to be a particularly challenging time (Bartram et al., 2009; Hatch et al., 2011; Volk et al., 2018). Similar to previous studies, all new graduates participating in the study at baseline had significantly lower levels of well-being and higher levels of stress and exhaustion as compared to normative populations. The current study aimed to evaluate an online professional development program for new veterinary graduates that incorporated peer support and training in professional skills.

The results indicate that participation in the program may have served as a buffer for burnout as veterinarians in the waitlist control group experienced significant increases in two measures of burnout over time, whereas program participants did not have significant increases in these measures. After the completion of the program, the new graduate veterinarians who participated in the program had significantly lower levels of exhaustion, a component of burnout, as compared to veterinarians in the control group. The qualitative data suggested that the program provided an important support network for the new graduates during the transition to practice.

The results of this evaluation also indicated that the online professional development program was effective at improving knowledge in professional skills with significant improvements in all mean self-reported abilities associated with curriculum learning objectives. Focus group data suggested program participants made improvements in their self-awareness, self-care, communication skills, and decision making. This data suggested that this online professional development program for new veterinary graduates may provide key support during the transition to practice and reduce early-career burnout.

5.2 Key Results

The transition to practice can be a stressful time for new veterinary graduates, and the mean stress level of all new veterinary graduates in the study shortly after graduation was significantly lower than a similarly aged cohort of the general population. In addition,

the mean well-being level of new veterinary graduates at baseline in this study was significantly lower than the mean well-being level of a large sample of veterinarians in the United Kingdom (Bartram et al., 2011). These findings appeared to be consistent with other studies that showed that the lowest levels of well-being and the highest levels of stress among all veterinarians were typically seen in younger veterinarians (Bartram et al., 2009; Gardner & Hini, 2006; Volk et al., 2018; Volk et al., 2020).

The professional efficacy of all new veterinary graduates in this study shortly after graduation was significantly lower than the general population, and the exhaustion level of the new veterinary graduates was significantly higher than the general population. A recent study evaluating mental health in Canadian veterinarians found a similar finding of significantly higher mean emotional exhaustion scores than a normative population (Perret et al., 2020). Over time, the mean exhaustion and cynicism of new veterinary graduates in the control group significantly increased suggesting burnout may worsen for new veterinary graduates after only 6 months in practice.

Overall, these findings suggested that new veterinary graduates were beginning their careers with relatively high levels of stress and burnout and low levels of well-being. This finding was consistent with previous studies showing lower well-being levels and higher levels of mental distress among veterinary students compared to the general population (Cardwell et al., 2013). In addition, veterinary students have shown high levels of burnout, and in one study, it was estimated that 30% of veterinary students were at a high risk for burnout (McArthur et al., 2017). These markers of poor mental health and well-being seem to persist into the early career which reaffirmed the need for intervention programs such as the one evaluated in the present study to help support the mental health and well-being of early-career veterinarians.

Seven new veterinary graduates participated in the professional development program and reported a statistically significant lower mean level of exhaustion, a measure of burnout, after participating in the program as compared to a waitlist control group of new veterinary graduates. After participation in the program, the mean stress and cynicism levels of the veterinarians who participated in the program had decreased and were slightly lower than the mean stress and cynicism levels of the waitlist control group. Well-being and social support levels increased over time for program participants and were higher

than the waitlist control group after participating in the program, though these changes were not statistically significant.

Five of the seven program participants strongly agreed that participation in the program helped them feel supported in the transition from student to veterinarian. The support network provided through the program was described as a safe place to share challenges faced during the transition to practice, and many veterinarians reported that because of this support network, they felt like they were not alone. Some of the new graduates mentioned that they were comfortable sharing the challenges they were facing with other veterinarians outside of the program. This could suggest that the program may encourage help-seeking behavior and decrease isolation as a coping tool for stress.

While program participants responded positively regarding the presenters, the online content, and the monthly meetings, they considered the incorporation of the social media app as an area for improvement. The app was intended to be used as a centralized place to post resources and share in case discussion, yet, it was not used frequently by many of the veterinarians in the group. In future iterations, adding additional veterinarians to the app may beneficial to provide advice and insight when new graduates post on the app. Alternatively, the social media app could be removed in the future as it was not seen by the new graduates to be as important as the online learning modules and monthly meetings. Additionally, spending more than 1 hour on social media daily was found to be associated with poorer mental health and well-being in veterinarians (Volk et al., 2018), and this finding may also support not using social media in programs such as these.

During the focus group, many of the veterinarians reported that they were able to directly apply much of the content that they learned throughout the program with some participants reporting that they used the module content daily. The program improved knowledge in non-clinical skills with self-reported increases in abilities associated with all learning objectives and improved scores on post-module tests as compared to pre-module tests. The focus group data suggested that the program provided some of the veterinarians with a new vocabulary to express themselves including how they are feeling and how they are practicing medicine. In addition, the veterinarians reported improvements in self-awareness, self-care, communication skills, and decision making. Self-care may be a particularly important skill that was taught through this program and may have had a large

impact on the results seen in the study. Veterinarians with a stress management plan (i.e. a self-care plan) were found to have a lower prevalence of serious psychological distress and higher well-being than those without a plan (Volk et al. 2020).

5.3 Curriculum Review

The purpose of reviewing the curriculum at each veterinary school was to determine if prior training in non-technical competencies was a confounding variable to the results seen in this study. There were varying levels of incorporation of professional skills training at all four veterinary schools. Participants that graduated from Schools 3 and 4 in the waitlist control group received a total of four to six credit hours in required professional skills courses including training in business, ethics, and communication skills. Many of the students from the waitlist control group also participated in non-required training for non-technical competencies. Participants that graduated from Schools 1 and 2 in the intervention group received eight and seven credit hours, respectively, of required professional development training throughout the veterinary school curriculum.

Participants in the intervention group received slightly more required credit hours in formal training in non-technical competencies than participants in the waitlist control group. It is possible that this small amount of required additional training benefitted students in the intervention group during the transition to practice. That being said, it was difficult to holistically assess all aspects of non-technical skills training within these curriculums. For example, the hidden curriculum, which may vary at each of these veterinary schools, may play a substantial role in the professional development of veterinarians through interactions with clients, other students, and clinicians and may affect veterinary students' communication skills, work ethic, empathy, and autonomy (Roder & May, 2017). In the present study, the only professional skills training assessed was the required credit hours and self-reported electives and additional training. Required co-curricular activities (e.g. required leadership workshops, conflict resolution training) may play a substantial role in professional skills training and were not assessed for this study. In future studies, a randomized group of new veterinary graduates would improve the validity of the results in light of training differences.

5.4 Hypotheses

Hypothesis 1: It was hypothesized that veterinary graduates participating in the professional development program would have lower levels of stress and burnout and higher levels of well-being after the completion of the program compared to veterinary graduates not participating in the program.

Veterinary graduates who participated in the professional development program had a lower mean level of stress after completion of the program compared to the waitlist control group of new veterinary graduates who did not participate in the program. While the mean stress level was lower for program participants, this difference was not statistically significant which may be attributed to the low number of participants in the intervention group. Over time, the mean stress level of the new veterinary graduates participating in the program decreased, whereas the mean stress level of veterinarians in the waitlist control group increased. This decrease in stress over time in the program participants could have resulted from the non-clinical skills training or the social support, both of which serve as coping resources which may buffer stress (Lazarus & Folkman, 1984).

When comparing the mean burnout levels of the two groups, a more significant difference was evident. Three aspects of burnout were measured in this study including exhaustion, cynicism, and professional efficacy. After the intervention, the new graduates who participated in the program had a significantly lower mean level of exhaustion compared to the veterinarians in the waitlist control group. In addition, new graduates in the waitlist control group had significant increases in cynicism and exhaustion over time, whereas program participants did not have significant increases in these measures. This may suggest that participation in the program may have served as a buffer for burnout. It is suspected that these lower levels of burnout in program participants may be, at least in part, a direct result of participation in the professional development program.

The qualitative data gathered supported the finding of lower levels of burnout in program participants and also suggested potential factors that might have led to the lower levels of burnout seen in program participants. Two veterinarians in the focus group mentioned that the program had prevented them from experiencing burnout early in their careers. They mentioned that this was likely due to the training that they had received

during the program in self-care, incremental care, and ethical decision making and being part of a peer support group. Conflict management and working with client financial limitations were two skills that new graduates felt least prepared for during the transition to practice (Reinhard et al., 2021), but within this study, several of the new graduates in the focus group mentioned that they felt more confident working with clients on limited budgets and communicating with others during conflict. As was hypothesized, gaining confidence in these non-clinical skills may have better prepared these young veterinarians for the common stressors of practice thus protecting them from experiencing increased burnout at the start of their careers. In addition, the peer social support network may have provided the new graduates with "psychological and material resources intended to benefit an individual's ability to cope with stress" (Cohen, 2004, p. 676) which may have served as a protective factor for the exhaustion component of burnout.

Professional efficacy which is another component of burnout was also measured. Both groups showed higher mean levels of professional efficacy on the second survey as compared to the first survey though the program participants showed a greater increase in mean professional efficacy over time. This is an encouraging finding which suggested that professional efficacy may improve in the early career despite intervention. On the second questionnaire, the waitlist control group had a higher mean level of professional efficacy than the program participants, although these differences were not statistically significant.

Finally, when comparing the mean well-being levels, it was found that after the program, the mean level of well-being for the program participants was higher than the mean well-being level of the waitlist control group. Over time, the mean well-being level of veterinarians in the program increased, whereas the mean well-being of those not participating in the program decreased.

Hypothesis 2: It was hypothesized that participants in the professional development program would have higher levels of informational social support after completion of the program compared to veterinarians not participating in the program.

Mean informational social support was measured using the MOS Social Support Survey support (Sherbourne & Stewart, 1991). The mean level of informational support was slightly higher after the program for the program participants as compared to the waitlist control group, but these means did not differ significantly between the two groups.

While the program attempted to provide peer support that was hypothesized to improve program participants' levels of informational support, it appeared that these levels did not change drastically.

While the quantitative measures of social support did not suggest a drastic change, the qualitative data suggested that peer social support was instrumental for the new veterinary graduates. A common theme that arose in the focus group was the support network that was created as a result of the program. Social support may be instrumental in acting as a coping resource to help buffer stress (Lazarus and Folkman, 1984). Some program participants discussed the importance of this network and their mandatory check-ins especially during the time of a global pandemic. Participants described the support network as a "safe place" with "no judgment" to share the "same struggles" and know "you're not alone." Mastenbroek et al. (2015) reported a similar phenomenon with changes in self-acceptance and self-esteem seen in recent graduates who participated in a professional development program stating that participants "recognized that they were not alone" (p. 4). The social support in this program may have served to decrease the stigma associated with mental health as group discussion may "demonstrate to those feeling overwhelmed that they are not alone" (Volk et al., 2020, p. 1244).

One interesting finding was that several of the new graduates appreciated having others from different veterinary schools within the cohort. It was hypothesized that the participants would likely connect more with their graduating cohort, but when analyzing the focus group data, it became clear that many of the program participants appreciated the diverse perspectives and meeting other graduates who were going through similar challenges. In future iterations of this program or other programs, the focus should be connecting individuals going through similar challenges and career experiences, but those individuals do not necessarily have to be working in the same practice or graduates from the same veterinary college. Perhaps, the support gained from others that they were not acquainted with before the program actually expanded the available support network of the new veterinary graduates. One veterinarian had mentioned in the focus group that the program had "expanded the support network . . . opened up that network to people in the same boat that we wouldn't have necessarily reached out to before."

Hypothesis 3: It was hypothesized that all veterinary graduates in the study would have higher levels of stress at baseline compared to a similarly aged cohort of the general population.

Similar to previous studies, the mean level of stress among all new veterinary graduates prior to the program was significantly higher than a similarly aged cohort of the general population. This finding confirms a phenomenon seen in both the United Kingdom and New Zealand where veterinarians, especially early in practice, have higher levels of stress than the general population (Bartram et al., 2009; Gardner & Hini, 2006). Higher stress in young veterinarians may be attributed to self-doubt, ethical dilemmas, conflict, assuming a leadership role, conflict, inadequate support, mistakes, and high workload (Gardner & Hini, 2006; Mellanby & Herrtage, 2004; Reinhard et al., 2021; Routly et al., 2002). Another factor mentioned in the focus group that caused additional stress was transitioning to practice during the COVID-19 pandemic. This particular stressor could have elevated the stress levels higher than would be expected during a non-pandemic year.

Hypothesis 4: It was hypothesized that the professional development program would be effective at increasing the knowledge of non-clinical skills topics covered in the program.

The professional development program was effective at increasing the knowledge of non-clinical skills topics covered in the program. This knowledge gain was evaluated by conducting a retrospective analysis of learning objectives and pretests and posttests within each of the modules. All 20 self-reported abilities that were associated with the learning objectives of the program were significantly higher after the program. In addition, the mean scores on the posttests were higher than the pretests for all modules with four of the five modules showing statistically significant increases.

The qualitative data also suggested that confidence in many of these non-clinical skills improved after participation in the program. Participants reported improvements in their self-awareness, self-care, communication skills, and decision making. Several program participants mentioned increased confidence in conflict management and working with clients with limited finances. The increase in self-awareness did not come as a surprise in the current study and is consistent with the finding of increased reflective

behavior in recent veterinary graduates participating in a 1 year professional development program (Mastenbroek et al., 2015).

5.5 Additional Limitations

In addition to the limitations described in Chapter 3, there were a few additional considerations to be made when interpreting the results of this study. The response rate was relatively low for participation in the study. A low response rate may introduce a non-response bias. In addition, the overwhelming majority of participants in this study were white and female. While this is considered a limitation, this demographic is somewhat similar to the current demographics of veterinary students. The Association of American Veterinary Colleges reported that 81.8% of veterinary students at U.S. veterinary colleges were female and 75.9% were white (Association of American Veterinary Medical Colleges, 2020). The overrepresentation of white females in this study could limit the generalizability of these results to other demographics. Finally, the participants in this study represented four veterinary colleges which may limit the generalizability to a larger population of new veterinary graduates.

5.6 Recommendations, Implications, and Conclusions

Apparent from the results of this study, veterinarians are beginning their careers with already high levels of stress and burnout and lower levels of well-being compared to normative populations. The poor mental health and well-being among veterinarians may start as early as veterinary school as veterinary students have shown lower levels of well-being, higher levels of mental distress, and high levels of burnout (Cardwell et al., 2013; McArthur et al., 2017). How can the mental health and well-being of veterinary students be improved so that veterinarians start at a lower baseline level of stress and burnout? These findings suggest that training on how to cope with stress and improve well-being should begin at the veterinary school level or perhaps at the pre-veterinary stage.

Another avenue for future studies could include a comparison of mental health and well-being of veterinarians who had varying levels of preparation in professional skills competencies in veterinary school. In the present study, four different veterinary schools

were represented and had slightly different amounts of required professional skills training. Assessing what impact the amount of professional skills training received within the veterinary curriculum has on recent veterinary graduate mental health could provide clues as to what and how much training is adequate.

Without intervention, the well-being, burnout, and stress levels of new veterinary graduates seemed to get slightly worse over time. This was especially apparent in the exhaustion and cynicism levels, components of burnout, which significantly increased over time for those not participating in the program. As this was a small sample of veterinarians from only a few veterinary colleges, it could be valuable to repeat this study in a larger population to see if this trend repeats. Assessing burnout, well-being, and stress longitudinally throughout the veterinary career could garnish valuable insight on what time points intervention strategies could be best targeted.

Professional development programs incorporating peer social support and training in professional competencies like the one described in the present study have the potential to promote early career veterinary well-being. It is important to note that the program did not just incorporate peer support, but also training in how to better navigate some of the most common stressors of veterinary practice including ethical dilemmas and conflict. Some of the stressors of the veterinary career will likely never completely disappear, but if veterinarians are better equipped to respond to these stressors, they likely will have a healthier stress response. In the present study, the most notable impact on early career well-being was the significantly lower level of the exhaustion component of burnout in program participants as compared to new graduates not participating in the program. This suggests that professional development programs should be widely offered to the recent veterinary graduate population to best support veterinarians transitioning to practice. This study could also provide the foundation for the development of additional programming.

In the present study, beneficial changes were seen in burnout, stress, and well-being shortly after participation in the program. Will these beneficial changes persist over time? While the results found in this study appeared promising, following the populations longitudinally throughout the career could be beneficial to see what impact the program has on mental health throughout the veterinary career. In addition, repeating this study

with a larger randomized sample size may create more significant and generalizable results.

As this program seemed to be effective at supporting new veterinary graduates in the transition to practice, future research could evaluate professional development programs similar to the one described here at different stages of the veterinary career. While the transition to practice may be one of the most stressful points of the veterinary career, there are also additional stressors that exist throughout the career. Developing and evaluating programs to support veterinary well-being throughout the veterinary career from incoming veterinary students to retiring veterinarians should be a priority for veterinary well-being researchers. While it is important to continue periodically monitoring trends in mental health among veterinary professionals, a more paramount concern is creating and evaluating research-based interventions to support veterinary well-being.

Researchers have frequently reported the lack of interventions to support the veterinary profession and have recommended research to develop and evaluate interventions (Bartram et al., 2010; Moses et al., 2018; Rohlf, 2018). Rhind and Grant (2017) suggested that researchers must continue to monitor the mental health and well-being of the profession, but also suggested focusing on building resilience and promoting well-being through designing innovative interventions. This is a clear call to action for veterinary well-being researchers and the veterinary industry as a whole to prioritize the time and resources toward creating and evaluating evidence-based programs designed to support veterinary professionals.

The professional development program evaluated in this study showed promising results in program participants' levels of burnout, well-being, and stress. Learning in professional skills improved through participation in the program, and the new veterinary graduates voiced that their self-awareness, self-care, communication skills, and decision making improved as a result of the program. Many of the veterinarians expressed that the program helped them feel supported in the transition to practice and provided them with an important support network. Going forward, this program should be offered to additional new and recent veterinary graduates to promote early career well-being and provide a stable foundation of support at the start of the veterinary career.

The pilot online professional development program not only has the potential to help veterinarians participating in the program, but it also has the potential to improve patient care, increase practice revenue, and increase retention of veterinarians within the profession. By instilling confidence in recent graduates, these individuals may be more empowered to create positive changes in the workplace culture within their own veterinary practices. This program should be widely offered to all new and recent veterinary graduates through the development of partnerships with organizations and industry partners. Over time, expanding access to this program to a large number of veterinary graduates has the potential to create systemic changes within the veterinary profession.

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