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STRESS IN THE VETERINARY MEDICAL FIELD

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STRESS IN THE VETERINARY MEDICAL FIELD

Abstract

Stress is something that affects most people on a regular basis. School can be a major stressor in the lives of students, and a person’s job can be highly stressful for some professionals. Veterinary students in particular are often stressed due to the nature of the education and the quantity of material that must be learned. Practicing veterinarians are considered to have a stressful job due to long hours, workload, difficult cases, and more. This paper reviews the available literature on stress in the veterinary medical field, and summarizes the research on the stressors faced by members of this field, the potential effects of that stress, and possible stress management plans. This research includes several members of the veterinary field, from veterinary students to practicing veterinarians to veterinary technicians. In addition to synthesizing the current research, I recommend future research areas with the goal of generating effective stress management techniques.
STRESS IN THE VETERINARY MEDICAL FIELD

Stress in the Veterinary Medical Field: A Literature Review

Introduction

People experience stress regularly in their everyday lives, in regard to relationships, work, school, finances, and more. Although the term “stress” is used frequently, it can mean different things in different contexts. Broadly, stress can be defined as “…the physiological and emotional changes brought on by stress hormones (such as adrenaline, noradrenaline, and cortisol) in response to certain situational or event stressors” (Gelberg & Gelberg, 2005). In other words, certain situations, scenarios, and tasks can cause a reaction in the body that leads to a variety of symptoms. Stress can manifest itself physically, behaviorally, or mentally. Physical symptoms can include troubles with sleeping, headaches, and stomachaches. Behavioral symptoms can include procrastination and substance abuse, and emotional symptoms can include irritability and restlessness. Cognitive symptoms can include problems with concentration and memory. While some level of stress can be beneficial and increase performance on certain tasks, high levels of stress can lead to health problems such as anxiety, depression, hypertension, obesity, fatigue, and more (Foster & Maples, 2014; Gelberg & Gelberg, 2005). Long term stress can be a risk factor for heart disease and stroke (Gelberg & Gelberg, 2005).

In addition to both mental and physical health problems, excess stress can lead to a poorer work performance, whether this is performance in school or on the job (Dawson & Thompson, 2017). Occupational stress, as described in subsequent sections, consists of the stressors specific to one’s job; long periods of occupational stress can lead to burnout. Although this topic is relevant in most or all professions, this paper will focus on stress in the field of veterinary medicine. This field is often characterized as being stressful, and veterinary surgeons have one of the highest reported suicide rates of any profession, along with doctors and other
STRESS IN THE VETERINARY MEDICAL FIELD

medical professionals (Dawson & Thompson, 2017). Stress affects many members of the veterinary medical field, ranging from veterinary students to practicing veterinarians to veterinary technicians. Various studies have examined stress in all three of these population types, in an effort to understand what the stressors are, how people cope with them, and what can be done to reduce that stress. Here, I synthesize the current research so as to inform the development of stress management techniques.

Veterinary Medical Students

The first year of veterinary school represents a major transition in the aspiring veterinarian’s education (Laakkonen & Nevgi, 2014). This transition can be difficult, and introduces a lot of stressors in both an academic and personal setting. Academic stressors include the amount of material being taught, the possible adjustment of study skills, and the necessary learning of new abilities, such as client communication, clinical skills, and business skills (Root Kustritz, 2017). Personal stressors can include things such as moving out, forming new relationships, sleep deprivation, financial concerns, and homesickness (Gelberg & Gelberg, 2005; Root Kustritz, 2017). Students must learn all of the material, while simultaneously dealing with an increased workload and longer school hours than the typical undergraduate education. A veterinary medical education has been described as “…an intensive professional training program characterized by a large amount of information based on rapidly evolving and diversifying scientific research” (Laakkonen & Nevgi, 2014). Students may not feel adequately prepared for this type of education, as many of the courses are very different from those offered to undergraduates, and the prerequisites may not provide an accurate representation of the difficulty level of the rigorous courses. In addition, until students gain confidence in their knowledge and abilities, being around ill or suffering animals can be stressful to them, since they
Stress and Depression

Multiple surveys have aimed to identify the levels of stress and depression experienced by veterinary medical students during their education. One such survey of students across 33 veterinary medical schools in North America reported that roughly half of the participants were experiencing at least moderate stress (Killiinger et al., 2017). However, these stress levels were comparable to those of other graduate or professional students. Similar results were found in a survey of students from all four years of the veterinary program at the University of Tennessee. These results also indicated that the students did not have significantly higher stress levels than the general population (Strand et al., 2005). However, their perceived stress levels were significantly higher than those of other college students, suggesting that veterinary students may perceive their experiences in school as more stressful than the general population perceives them.

There is a strong correlation between stress and depression in veterinary students, with women demonstrating higher levels of both stress and depression (Killiinger et al., 2017; Strand et al., 2005). Two thirds of the respondents to one survey had symptoms consistent with mild or moderate depression, which is higher than the rate seen in medical students or other college students (Killiinger et al., 2017).
STRESS IN THE VETERINARY MEDICAL FIELD

Rates of stress and depression are different in each of the four years of the veterinary education. One study found that first-year students were less stressed than students in the remaining three years, perhaps because they had not yet started clinical work (Killiinger et al., 2017). The highest levels of stress and depression were apparent in the second and third years. A different study found first-year students to have the highest stress levels, perhaps due to the educational transition and difficulty of the curriculum (Strand et al., 2005). This study suggested that fourth-year students were better able to adopt behaviors and thinking patterns that reduced stress levels, and they were better able to enjoy the accomplishments they had made up to that point in their academic careers.

Education and Training

One of the unique aspects of a veterinary education is the practice of clinical procedures and treatments. Students are exposed to both animal-based and simulator-based training for these procedures. Simulator training involves the use of model animals that have been created for students to practice their skills on, prior to doing a treatment or procedure on a live animal (Nagel et al., 2015). However, live animals are also used for educational and training purposes, even for students who have not practiced on a model. The use of a live animal can be risky, and may not be considered ethical by the students, creating a stressful situation. Questionnaires have indicated higher levels of anxiety in surgical versus non-surgical courses; furthermore, the use of simulator training before surgery on live animals helped reduce that anxiety.

A study of the stress response of students to a gynecological examination of horses looked at the differences between animal-based and simulator-based training. A gynecological examination may be considered by some students to be invasive and stressful, as it involves inserting something such as a hand into the horse’s body (Nagel et al., 2015). This procedure can
STRESS IN THE VETERINARY MEDICAL FIELD

be risky due to possible perforation of the rectum, which can lead to the death of the horse. Stress can impair learning and performance, and may lead to problems with handling the horse and successfully completing the procedure. It requires a lot of practice to locate and describe the ovaries and uterus, and some students practice this skill on models, while others practice on live horses (Nagel et al., 2015).

The short-term stress response of the hypothalamic-pituitary-adrenocortical (HPA) axis can be measured by the concentration of the stress hormone cortisol (Nagel et al., 2015; Tecles et al., 2014). Cortisol rapidly diffuses into the saliva, and salivary concentrations reflect the levels of cortisol in the blood (Nagel et al., 2015). In addition to the release of cortisol, acute stress can lead to the release of epinephrine, causing an increase in heart rate. These physiological responses were used to measure the stress levels of students performing a gynecological examination. During all of the examinations, cortisol levels increased when the students began the exam, and decreased from that point forward. The overall increase in salivary cortisol concentration during the examination was not significant; however, the concentration was higher before the examination than after. This may suggest an anticipatory stress response resulting from the students’ knowledge that they were about to perform the exam. There was also an increase in heart rate associated with the examination. The difference in heart rate was not as significant in the students who had been trained on live horses, suggesting that the students trained on simulators had a higher stress response. The anticipatory response was reflected by an increased heart rate before rather than after the exam.

Despite the differences in the physiological stress response, the students from both groups rated the exam as equally stressful (Nagel et al., 2015). Although the stress response to the exam was greater on simulator-trained students, anxiety about causing rectal lesions was
STRESS IN THE VETERINARY MEDICAL FIELD

higher in students trained on live horses, perhaps due to an increased awareness of the risks of the procedure. The results of this study indicate that at least some of the hands-on training and procedures are stressful to the students.

Another aspect of education that is stressful to students is oral presentations. Although not unique to the veterinary medical education, oral presentations still represent a relevant source of stress. A similar study using salivary biomarkers studied the stress response of Spanish veterinary students to an oral presentation in a clinical pathology class (Tecles et al., 2014). Salivary cortisol concentrations were used as an indicator of stress. Salivary alpha-amylase (sAA) was also measured as a biomarker for stress, which reflects the stress response of the sympathetic nervous system. sAA is released much more quickly than cortisol; thus sAA can be a useful measure for short-term stress responses. During the presentation, cortisol levels increased significantly, indicating a stress response to the oral presentation. Although cortisol levels peak at around 20-30 minutes after exposure to a stressful stimulus, in this case the presentation, the levels were already significantly high after only five minutes, suggesting that there was also an anticipatory stress response to the presentation. An increase in sAA levels likewise reflected the students’ stress response. These salivary measures of stress were not correlated with the students’ reported stress levels regarding the presentation, suggesting that perceived stress and the physiological stress response do not always align. These measures of stress could potentially be used to evaluate other aspects of the veterinary medical education, and can help identify which tasks or assignments students find most stressful.
STRESS IN THE VETERINARY MEDICAL FIELD

Study Skills

Veterinary students indicate feeling higher levels of time pressure than other college students (Strand et al., 2005). They can become overloaded by the amount of information they must learn in a short period of time (Gelberg & Gelberg, 2005). Students must learn about anatomy, physiology, diagnosis, treatment, etc. on a variety of animal species. Time outside of class is spent studying and learning all of this material. The veterinary medical education is very time consuming, and there is a tendency to procrastinate, which increases stress associated with the task that is being pushed back (Strand et al., 2005). It is possible that students can only cope with their limited time by procrastinating on some things in order to finish others. In addition, first-year students may not have sufficient study or time management skills, because they are unused to the workload required to succeed in veterinary school (Gelberg & Gelberg, 2005). The results of one questionnaire indicated that students who had previously earned a larger number of college credits were less stressed by the coursework, and were better able to handle taking multiple difficult classes at the same time (Laakkonen & Nevgi, 2014). Furthermore, efficient study skills were associated with lower stress levels regarding the coursework. Perhaps teaching better time management and study techniques can help decrease these types of stressors (Strand et al., 2005).

Student Mindset

In addition to previous coursework, efficient studying, and good time management skills, student mindset may play a role in academic success and perceived stress levels (Root Kustritz, 2017). A growth mindset is one in which an individual believes they can improve their abilities through hard work and dedication. These people view failure as a learning opportunity, and typically perform stronger academically. They are more resilient in the face of struggles. In
STRESS IN THE VETERINARY MEDICAL FIELD

In contrast, people with a fixed mindset believe that their abilities are fixed and cannot be improved upon. They are more likely to experience stress than people with a growth mindset. Based on this information, it seems that a growth mindset would be more beneficial to veterinary students. One survey of second-year veterinary students examined the relationship between mindset and stress levels. The results from this study indicated that a majority of the students had a growth mindset, while some had a fixed mindset with some ideas of a growth mindset (Root Kustritz, 2017). None of the students had a strong fixed mindset. Based on these results, it seems that most veterinary students have at least some aspects of a mindset associated with growth and resilience, but it is possible that there were students with fixed mindsets who did not respond to the surveys. Despite the prevalence of growth mindset characteristics, this study found no association between mindset, perceived stress, and academic performance, even though it seems that having a growth mindset would be beneficial to veterinary students.

There are many ways in which schools could offer support to students. In addition to offering support for stress management, schools could train students on how to think in terms of a growth mindset (Root Kustritz, 2017). Perhaps they could offer courses or workshops in several areas, such as stress management, time management, study skills, and mindset. They could teach students how to potentially reduce stress levels through healthy diets, physical exercise, forming support systems, and other techniques. In addition to educating the students about the symptoms of stress and how to cope with them, schools could train the teaching staff on signs of stress and educate counselors on the stressors specific to the veterinary medical education (Gelberg & Gelberg, 2005).
STRESS IN THE VETERINARY MEDICAL FIELD

Practicing Veterinarians

After graduating from school and becoming licensed veterinarians, members of the veterinary medical profession face new stressors on the job. Occupational stress can be described as “…the adverse reaction employees experience in response to excessive pressures of the workplace” (Dawson & Thompson, 2017). This stress can be difficult on both the employee and the employer. There are many aspects of the veterinary profession that can be stressful, such as workload, difficult clients or patients, and moral and ethical dilemmas. There are also emotionally difficult cases and high expectations from clients or from the veterinarians themselves. All of these factors can impact occupational stress levels.

Occupational Stress and Burnout

A survey of almost one thousand veterinarians in New Zealand gathered information about the workplace and stress associated with the job. The situations that were reported as the most stressful were the number of hours worked, the client expectations, and the cases with unexpected outcomes (Gardner & Hini, 2006). Other significant stressors included communication with clients and a lack of professional support. Stress levels tended to decrease a little bit with age, and women generally reported higher stress levels than men. The type and size of the veterinary practice influenced different stressors in different ways. The use of social support systems to manage stress, such as friends, family members, coworkers, or counselors, also differed among different ages, genders, and practice types. These results suggest a complex relationship between stress and the various aspects of the veterinary clinical environment.

Another study examined the levels of job strain, job engagement, and burnout in Belgian veterinary surgeons. Occupational stress in this study was defined as "…a process by which job demands are appraised by the worker as exceeding their own resources which results in
STRESS IN THE VETERINARY MEDICAL FIELD

undesirable health consequences" (Hansez et al., 2008). Job strain includes such things as feeling overloaded by one’s workload, or feeling nervous at work. Burnout can be defined as “physical, emotional, and mental exhaustion attributed to long-term involvement in an emotionally demanding job” (Foster & Maples, 2014). It is characterized by emotional exhaustion, depersonalization, and a lack of personal accomplishment (Hansez et al., 2008). In contrast, job engagement is measured in terms of feelings of satisfaction or stimulation associated with work.

The study results indicated a high level of job engagement, suggesting that the veterinarians were satisfied with their work despite the stress that it entails. There was a moderate level of job strain that was demonstrated, but it was not significantly higher than that of other professions. However, more than 15% of the respondents reported high levels of emotional exhaustion, which is an indicator of burnout. This high rate of burnout may be reflective of the level of occupational stress that veterinarians face. The relationship between job strain, occupational stress, and burnout is a potential area for further study.

Ethical Dilemmas

One of the aspects of the veterinary profession that can be highly stressful is the presence of situations that are ethically challenging or conflicting. Veterinarians must constantly balance the quality of life of their patients with the available treatment options and the wishes of their clients (Batchelor & McKeegan, 2012). Sometimes the interests of the animal and the client may not be aligned, leading to an ethical dilemma for the veterinarian. People are universally viewed as having moral value, but the perceived moral worth of animals differs considerably among different individuals. For veterinarians who want to help animals, it can become difficult to determine if they should give more consideration to the animal or to the client. One scenario in which this conflict is demonstrated involves what is called convenience euthanasia. This occurs
STRESS IN THE VETERINARY MEDICAL FIELD

when a client brings in a healthy animal to be euthanized, perhaps because they can’t afford it, don’t have the time to take care of it, or don’t want it anymore. Euthanizing an animal for the sake of convenience can be morally problematic for veterinarians, and there is a conflict between what the client wants and what is seen as best for the animal. This type of ethical dilemma is unique to the veterinary medical profession, and there are many other types of dilemmas that veterinarians face on a regular basis.

Questionnaires taken by practicing veterinary surgeons in the UK were studied to determine the frequency of ethical dilemmas and the stressfulness of those dilemmas. The respondents were asked to rate three common dilemmas in terms of stressfulness. These dilemmas included convenience euthanasia of healthy animals, restricted treatment options due to financial limitations of the client, and clients wishing to continue treatment despite an animal’s poor welfare or quality of life (Batchelor & McKeegan, 2012). This third dilemma was rated as the most stressful, whereas financial limitations were rated as the least stressful despite being faced the most often. The scenarios involving convenience euthanasia and continued treatment may be more stressful because the veterinarian may not agree with the client, and may have to do something they are not morally comfortable with. Respondents reported dealing with anywhere from one to more than ten ethical dilemmas each week, and a majority of the respondents did not feel as if they had gotten enough ethical training during their education. Formal ethical education is relatively new in veterinary schools, and may be very important in helping prepare veterinary students for their profession.
STRESS IN THE VETERINARY MEDICAL FIELD

Personality

Environmental factors are those most frequently studied in regard to stress in veterinarians. However, one study looked instead at the effect of personality on stress levels. There are a lot of facets to an individual’s personality, and many of these traits could play a role in how that individual experiences stress. An email was sent out to hundreds of veterinary surgeons in the UK, and the participants took a personality test and surveys assessing job stress and burnout. The results were statistically analyzed, and it was found that personality rather than environment was the best predictor of occupational stress (Dawson & Thompson, 2017). Several personality traits were examined, but it was found that neuroticism was most closely correlated with stress and depression in veterinarians. Neuroticism reflects the degree to which people experience feelings such as anxiety, worry and frustration. High neuroticism was associated with high levels of stress. It was also found that new veterinarians often felt higher levels of stress than experienced veterinarians, suggesting that some sort of resilience is developed as more experience is gained.

Another personality trait that is prevalent in veterinarians is perfectionism (Dawson & Thompson, 2017). Veterinarians go through a highly competitive admissions process to get into school, and subsequently go through four years of a demanding education with little room for error. Because of this, veterinarians are often seen as perfectionists. This trait of perfectionism can lead to an individual developing unrealistic standards and goals, placing extra pressure on their work, and becoming dissatisfied with their professional performance. Perfectionism has previously been associated with mental health problems such as anxiety or depression, and it may contribute to the high stress levels experienced by many veterinarians.
Veterinary Technicians

Veterinary technicians are a very important part of any veterinary clinic. They interact with the clients and patients, assist doctors with treatments on the animals, help care for hospitalized pets, fill medications, order supplies, make phone calls, and more. Veterinary technicians can also experience significant levels of occupational stress. High stress can be linked to heavy workloads and long hours, as well as several other factors of the job (Foster & Maples, 2014). There are environmental factors such as high noise levels or temperature, psychological factors such as ethical dilemmas or conflicts with coworkers, and traumatic factors such as witnessing tragic cases or deaths. These are all a part of working at a veterinary clinic, and these stressors can build on top of one another and lead to burnout. Veterinary technicians may also develop compassion fatigue, which results from the type of stressors involved in a profession in which help is being offered to people who are going through traumatic times. For example, veterinarians and veterinary technicians may cry with upset clients, or feel guilty or sad after the death of a patient. This, like other types of stress, can lead to low morale and poorer work performance.

A survey of over one hundred members of the Alabama Veterinary Technician Association identified several work-related themes among veterinary technicians. For instance, many of the technicians deal with taking the blame for various difficulties at the clinic – doctors may blame them for the death of a patient; clients may blame them for the long wait for the doctor or for expenses, since technicians are often the ones who discuss payment with them (Foster & Maples, 2014). Environmental stressors such as noise are often an issue, as well as the stress associated with being around frustrated coworkers and doctors. The inability to provide care for a patient in need provided a major source of stress for many of the technicians. In
STRESS IN THE VETERINARY MEDICAL FIELD

addition, working in a veterinary clinic comes with the risk of injury or illness. Bites and scratches are incredibly common, and in practices with larger animals such as dogs or horses, there can be injuries such as sprains or fractures. All of the participants in this study had some sort of scar resulting from an injury at work. The type of practice may also play a role in stress levels, as different practices treat different types of animals, have differing hours, and vary in the types of treatments and procedures performed at the clinic. Different practices also have different policies regarding walk-ins and emergencies, and whether or not those cases are seen. All of these types of stressors play a role in contributing to occupational stress and burnout among veterinary support staff.

Limitations

While the aforementioned studies are invaluable in understanding the stress of veterinary medical students and practitioners, there are some limitations to the research. Much of the research to date was facilitated through questionnaires, surveys, and assessments that were sent out to participants. Because the data depends on the responses received, it is possible that some of the information is skewed. Perhaps only certain people are able or willing to respond, such as veterinarians with a smaller workload, students who already have a certain type of mindset, etc. The responses may not accurately reflect the populations being studied. Similarly, much of the research looks at small groups of people, who may not be representative of the larger population of interest. With that said, the research still provides useful information and points out important trends that can be studied in order to better understand the role of stress in the veterinary medical field.
STRESS IN THE VETERINARY MEDICAL FIELD

In addition to the research limitations, this review paper is limited in that it only reviews a small number of sources, due to difficulty accessing articles. This paper overviews the main themes and studies found when researching the topic, but it is possible that there is some current research that is not represented.

**Implications and Future Research**

Although there have been several studies investigating stress in the veterinary medical field, there is still a lot of research that needs to be done. Particularly, there should be more research looking into which aspects of the veterinary medical education and veterinary practice are the most stressful. With a good idea of the specific stressors faced by members of the veterinary medical field, it will be possible to come up with stress management techniques and programs to help alleviate that stress. So far, there hasn’t been a lot of research on ways to reduce stress for veterinarians and veterinary students. Some researchers have suggested offering courses teaching time management and study skills, and developing social support systems in order to reduce stress. It may be beneficial to have some sort of stress management specific to the stressors of the veterinary medical field, such as compassion fatigue and ethical dilemmas. In addition, the research regarding mindsets and personality brought up interesting ideas regarding further factors influencing the level of stress experienced. Understanding unique mindsets and personality types may help tailor stress management plans to the individual, and lead to more effective techniques. However, there doesn’t appear to be any research on whether or not these strategies are effective, or on which strategies are the most successful.

In addition to research regarding stress and stress management, there should be more studies focusing on other members of veterinary clinics. Some research has focused on veterinary technicians, bringing up unique stressors that are associated with the role the
technicians play in a clinic. However, there could be more studies focusing on veterinary technicians, in order to lead to potential stress management techniques to help them specifically.

Furthermore, there does not seem to be any research examining the role of stress in the lives of veterinary receptionists. Receptionists are a vital part of a veterinary clinic, answering calls, relaying information from client to technician/doctor and back again, checking in appointments, taking payment, and more. A lot of the aspects of the job are similar to those of a receptionist at any business. However, there are certain aspects that are unique to a veterinary practice, such as talking to panicked clients, rushing emergency patients back to the doctors, and checking out clients who have just lost a beloved pet. With these additional sources of potential stress, it would be interesting to see if veterinary receptionists experience stress differently than receptionists at other types of businesses. If they do experience stress differently, perhaps they would benefit from similar stress management ideas as the ones geared toward a veterinarian or veterinary technician.

Finally, kennel technicians are also exposed to sickness, death, and euthanasia, and are around other staff members who may be stressed or frustrated. In addition, they face some of the same environmental stressors as the other members of a veterinary clinic. More complete research needs to be done on each job position at a veterinary clinic, in order to understand the unique dynamics and stressors that accompany that environment. This can potentially lead to the discovery of effective stress management strategies that can benefit many members of the veterinary medical field, hopefully improving their working lives.
STRESS IN THE VETERINARY MEDICAL FIELD

References


STRESS IN THE VETERINARY MEDICAL FIELD

