

2017

Physical Demands and Health Risks in a Professional Occupation: An Analysis of the Implications for Mental Health

Boateng, Salome

Boateng, S. (2017). Physical Demands and Health Risks in a Professional Occupation: An Analysis of the Implications for Mental Health (Master's thesis, University of Calgary, Calgary, Canada). Retrieved from <https://prism.ucalgary.ca>. doi:10.11575/PRISM/27349

<http://hdl.handle.net/11023/3861>

Downloaded from PRISM Repository, University of Calgary

UNIVERSITY OF CALGARY

Physical Demands and Health Risks in a Professional Occupation:
An Analysis of the Implications for Mental Health

by

Salome Konadu Boateng

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE
DEGREE OF MASTER OF ARTS

GRADUATE PROGRAM IN SOCIOLOGY

CALGARY, ALBERTA

MAY, 2017

© Salome Konadu Boateng 2017

Abstract

This thesis extends the Job Demand-Control (Support) model by examining whether physical demands and health risks impact on the mental health of professional workers. It also examines whether men and women experience different amounts of physical demands and health risks and whether the impact on depression differs by gender. Survey data from 378 veterinarians were used. First, women report significantly more frequent experiences of improper posture and lifting, exposure to radiation and exposure to chemicals and gases as compared to men. Second, improper posture and lifting and risk of injury and illness have significant positive effects on depression for both women and men, whereas risk of injury and illness and exposure to radiation have significant gender-specific effects on female and male veterinarians' depression. The findings of this study further our understanding of the impact of work experiences on professionals' mental health.

Acknowledgements

There are several people that I would like to formally thank for the role they played in the completion of this thesis.

First and foremost, to Dr. Jean Wallace: Thank you for all of your patience, understanding, guidance, feedback and immense support over the past two years and for all the opportunities you have given me. You have taught me so much and have helped me gain great experience in research and it was an absolute pleasure working with such an amazing supervisor! I made it this far because you always helped bring out the best in me.

To Dr. Pallavi Banerjee and Dr. Peter Sherer: Thank you for your helpful comments, questions and suggestions as members of my examining committee.

To the Department of Sociology: Thank you for the learning experiences and great support provided throughout the program.

To my fellow students: Thank you all for your friendship and support throughout the program. I wish you all the best. In particular, thank you to James Wyatt Anton, Valerie Salt and Evan Brewis for being such great colleagues to work with and for your friendship.

To my parents: Thank you for encouraging me to continue my education and for saying yes when I told you about my dreams.

To my sister Matilda: Thank you for always being available to listen and share in all moments of my life.

Dedication

To my amazing parents, for all of their support, encouragement,
and love all these years.

Table of Contents

Abstract.....	ii
Acknowledgments.....	iii
Dedication.....	iv
Table of Contents.....	v
List of Tables.....	viii
List of Figures.....	ix
List of Appendices.....	x
Chapter 1 – Introduction.....	1
Chapter 2 – Review of the Literature.....	5
Mental Health.....	5
Theoretical Framework: Karasek’s Job-Demand-Control (Support) Model.....	7
Gender Differences in Work Experiences.....	9
Physical Demands and Health Risks.....	22
Chapter 3 – Methods and Data.....	29
Data Source.....	29
Measures.....	30
Reliability and validity.....	30
Dependent variable: Depression.....	36
Independent variables.....	36
Job demands.....	36
Job control.....	37
Social support.....	38

Physical demands.....	38
Health risks.....	38
Control variables.....	39
Statistical Procedures.....	40
Regression diagnostics.....	40
Statistical analyses.....	43
Chapter 4 – Results.....	46
Mean Difference Results.....	46
Gender Mean Difference Results.....	46
Physical demands and health risks.....	46
Dependent variable: Depression.....	46
Other independent variables.....	47
Control variables.....	47
Summary of mean difference results.....	48
Ordinary Least Square (OLS) Multiple Regression Results.....	50
Physical demands and health risks.....	50
JDC(S) model.....	51
Control Variables.....	52
Summary of OLS multiple regression results.....	52
Tests for Interaction Effects Results.....	52
Buffering interaction results.....	52
Gender interaction results.....	54
Chapter 5 – Discussion and Conclusions.....	57

Do men and women experience the same amount of physical demands and health risks ?.....	56
Do men and women differ in other ways?.....	57
Do physical demands and health risks affect their mental health?.....	60
What other demands and work resources are related to mental health?..	62
Do the effects of physical demands and health risks on mental health differ by gender?.....	64
Limitations and contributions of the study.....	66
References.....	71
Appendices.....	88

List of Tables

Table 1 Descriptive Statistics for All Variables Included in the Analysis (N = 378).....	32
Table 2 Zero-Order Correlations for the Variables Used in the OLS Regressions (N = 378).....	33
Table 3 Mean Difference for Male (N = 94) and Female (N = 249) Veterinarians.....	49
Table 4 Regression Results of the JDCS Model and Physical Demands and Health Risk Variables.....	56

List of Figures

Figure 1 Conceptual model of hypothesized relationships between job demands, job control, social support and mental health.....	27
--	----

List of Appendices

Appendix A: JDCS Coping Resources Moderator Results.....	88
Appendix B: Gender Interaction Results.....	90

Chapter 1 - Introduction

The interest of sociologists in occupations that are non-normative gendered occupations has been growing as there has been an increasing number of men taking up jobs in previously known female-dominated jobs such as nursing, and teaching, and women entering male-dominated jobs such as medicine, and engineering. However, research on such changes has focused primarily and understandably on its implications for the wage gap between men and women in these occupations (Irvine and Vermilya, 2010; Lofstedt, 2003). Research has also examined how workers select occupations and or search for jobs (Yakubovich, 2005; Drentea, 1998) and analyzed discrimination in hiring and promotion practices (Reskin and McBrier, 2000; Kmec 2005). What has been largely ignored is the impact of these trends on workers' health, especially their mental health.

Sociologists studying work have identified three groups of occupations: white, pink and blue collar occupations (Hodson and Sullivan, 2012). These occupations are usually described based on their gender composition, work demands, and health factors. White collar occupations are professional occupations which are usually described as intellectually challenging, clean and safe. Professional work, which belongs to the white collar group has historically been male-dominated. Pink collar occupations are female-dominated occupations that are described as emotionally demanding, clean and safe. Blue collar occupations are male-dominated occupations that are described as physically demanding, dangerous and dirty.

However, what is emerging are professional occupations that are becoming female-dominated, but are also physically demanding, dirty and dangerous. This is usually not the gendered expectations for either female-dominated jobs or professional work. Again, there has been a considerable shift in jobs from requiring physical demands to mental demands even though

that does not mean physical demands do not exist in the workplace (de Jonge et al, 2010). De Jonge et al (2010) argue that the increased use of technology and increase in service jobs with direct client or customer contact has led to more mental and emotional demands, thus less emphasis on physical demands at the workplace. Physical demands may consist of work demands that involve lifting, standing, or carrying heavy loads. Research that has focused on the effects of physical demands on worker health has found that these demands affect the musculoskeletal system of the human body and can cause psychosomatic health complaints and sickness-related absences among workers (de Jonge et al, 2010). Even though research provides us with insight into how these physical demands affect workers' physical health, there is little knowledge about whether these demands can also affect the mental health of workers especially those in professional occupations.

Health risks at work, which refer to work tasks that expose individuals to serious illnesses, have also become an increasingly important topic around the world. Accidents and illnesses that occur at the workplace have been linked to greater exposure to health risks (Cioni and Savioli, 2015). Workers who work in an environment where they are exposed to health risks are therefore more likely to have various illnesses. While professional workers may not be expected to have such experiences, the nature of work and the composition of work in some professional occupations, such as human and veterinary medicine, to a large extent may predict otherwise. The demands in some professional occupations may require exposure to health risks that include excessive noise, dangerous equipment, poor lighting conditions, radiation, chemicals, gases, and slippery surfaces (Reijula et al, 2003). Working in such an environment may lead to workers experiencing minor or major forms of injuries and accidents.

Veterinary medicine is a professional occupation that has recently shifted from being male dominated to female dominated but still remains one of the professions with high health risks. In

one study, the risk of an accident at work was as high as 71% in some veterinary medical practices and also 66% of male and 54% of female veterinarians reported risk of accidents (Reijula et al, 2003). A similar study that focused on the health risks of veterinary medicine revealed that 88% of the respondents performed radiographic examinations, 49% of the respondents also reported adverse exposure to hazardous chemicals such as inhalant anesthetic gases such as isoflurane, halothane, and nitrous oxide, and antineoplastic drugs (Hill, Langley and Morrow 1998).

Men and women in these kinds of occupations may have various work demands and concerns that can have serious repercussions for their mental and physical health. Despite the importance of this matter, research has not sufficiently considered and examined the physical demands and health risks in professional occupations, their impact on mental health and potential gender differences in work experiences. Therefore, my research aims to examine and address these gaps by answering the following questions using data from a sample of veterinarians:

- 1) Do men and women experience the same amount of physical demands and health risks?
- 2) Do physical demands and health risks affect their mental health?
- 3) Do the effects of these demands and health risks on mental health differ by gender?

These questions are addressed using questionnaire data from a sample of male and female veterinarians. This sample was chosen because the respondents are all employed in a professional occupation that is not only intellectually challenging but may also require extensive physical demands, and frequent exposure to a number of health risks. This sample is therefore well suited to examining how physical demands and health risk are related to mental health. Also, limiting this analyses to one occupation helps control occupational differences associated with educational

levels, job-specific work experiences and work settings. Answering these questions through my research will be beneficial to the research community who has paid less attention to physical demands and health risks in professional work and their impact on men and women's mental health.

This thesis is organized as follows. First, a review of literature is presented, along with a description of the conceptual framework that guides this study and a systematic presentation of the hypotheses that are tested in this thesis. Next, the sample, data, and methods used in this study are described and following this the results are presented. It then concludes with a discussion of the findings, their implications, the limitations of the study, and recommendations for future research.

Chapter 2 - Review of the Literature

This chapter starts with a brief explanation and summary of research findings on mental health in the workplace. This is followed by a description of the theoretical framework guiding this study and a figure to further illustrate the conceptual model. Next, it summarises literature examining the relationship between work and mental health. In this section, the relevant literature on specific work variables are presented: job demands, job control and social support. Finally, the chapter discusses the main focus of this study which is including additional job demands relevant to veterinarians and the possible gender differences in these work experiences. This last section provides a brief description of these job demands that include physical demands and health risks and how they may be related to veterinarians' mental health.

Mental Health

Mental health can be understood as the extent to which an individual experiences psychological and emotional well-being. Because work plays such an important role in an individual's daily life, there is a concern over how work may impact on one's mental and physical health (deJonge et al 2010; Shirangi, Fritschi, and Holman, 2013; Wallace, 2005). Professional work usually involves activities that are cognitively complex and strenuous. It often requires working under time pressures. Individuals may also have work demands that involve difficult interpersonal interaction with coworkers or clients. All of these factors can impact on their well-being (de Jonge, van Vegchel, Shimazu Schaufeli and Dorman, 2010). When individuals are overwhelmed by their work activities, they are more likely to experience negative psychological outcomes, such as job strain, burnout or depression (Wallace, 2005).

Research examining the relationship between work and mental health has increased over time and has found that work can indeed impact on individual's mental health. In this research, the

most common outcomes examined are workers' depression, burnout and job stress (Bhui, Dinos, Stansfeld, and White, 2012; Ganster and Rosen, 2013). Workers report feeling depressed and/or stressed from performing their various work activities, which usually deters them from being more productive at work and prevents them from participating more fully in other aspects of their lives (Deacon and Brough, 2016; Demerouti et al, 2014). Even though performing work activities may provide a sense of achievement and growth for individuals, it can also deteriorate their mental health if workers feel the demands and expectations of their work roles are too great and overwhelming.

The nature of work for a professional occupation, such as veterinary medicine, has led to a number of studies on how work may affect their health. While some of these studies have considered the impact of work on their physical health, there are also others that have focused on mental health. These studies have shown veterinarians report higher levels of depression, stress and burnout than most of their counterparts in the field of human medicine (Bartram, Ghasem and Baldwin 2009; Hatch, Winefield, Christiec and Lievaart 2011). These studies also suggest that veterinarians report having suicidal thoughts and have a higher suicide rate due to the demands of their work (Bartram and Baldwin, 2010; Halliwell and Hoskin, 2005). According to Platt et al (2012), some of the veterinarians they interviewed or surveyed felt "complete, utter helplessness, frustrated, and thought of no other way to cope with their work stress and have attempted suicide to serve as a form of communicating feelings to others on how they felt" (2012:5). Reijula (2003), in his study on occupational health of veterinarians, found that workers in this profession put in considerable effort to stay committed to their work. However, such efforts may leave them experiencing regular fatigue and/or burnout, which also can affect them mentally.

In this study, I will be focusing on depression as a measure of the mental health of veterinarians. Most of the veterinary profession work in clinical settings (Fritschi, Shirangi, Robertson, and Day, 2008; Reijula, 2003). These veterinarians have daily interactions with both clients (animal owners) and animal patients. They serve as care direct care providers and often must deal with the emotional demands associated with both their human clients and animals (Rank, Zaparanich and Gentry, 2009). As indicated above, these emotional demands can leave them feeling helpless and frustrated as it leads to a depletion of emotional energy and burnout (Lheureux, Truchot, and Borteyrou, 2016). This feeling of helplessness may lead to thought of suicides among veterinarians. The growing awareness of this impact on their mental health has led to several studies which found that veterinarians have higher rates of suicide and suicidal ideation than other health care occupations (Bartram et al, 2009, Hatch et al, 2011 and Platt et al, 2012). This suggests that the degree to which some veterinarians must deal with excessively stressful work conditions may lead to them feeling depressed, hence a need to examine how work demands impact on their mental well-being, especially depression.

Depression can be understood as the feelings of sadness, loneliness, and sometimes having trouble in focusing on one activity (Ross and Mirowsky, 1989). As mentioned above, depression is one of the common measures that has been studied by many researchers who focus on the impact of work on mental health (Bhui, Dinos, Stansfeld, and White, 2012; Ganster and Rosen, 2013; Wallace, 2005). Because work plays an important role in individuals' lives, any action or decision pertaining to it usually affects the other aspects of their lives too, which in this case, their mental health. While this level of impact may differ based on the type of occupation and job orientation one has (Aronsson, Gustafsson and Dallner 2002), the perceived negative impact on mental health has been reported as feeling depressed (Evans-Lacko, and Knapp, 2014; da Silva, Lopes, Susser,

and Menezes 2016). Some workers report feeling depressed when they are overwhelmed from dealing with their everyday work activities. They therefore report poorer mental health as compared to other workers who are able to effectively cope with their work demands. Karasek's Job Demand-Control (Support) model will be used as a framework to examine the extent to which veterinarians' mental health is affected by their work experiences.

Karasek's Job-Demand-Control (Support) Model

Karasek's (1979) Job Demand-Control (JDC) model is one of the most influential and most widely used models in examining the relationship between work and job strain (Hausser, Mojzisch, Niesel, Schultz-Harz, 2010; Van der Doef and Maes, 1999). According to Karasek (1979), two basic elements in the workplace are important for understanding job strain: (1) job demands placed on the worker; and (2) the job control the worker has to make work-related decisions and use discretion in applying his or her skills and abilities. Job demands involve workload, time pressure and role conflict and job control refers to worker's decision latitude in both skill discretion and decision authority. Job strain occurs when there are incompatibilities between the job demands of workers and their level of decision making at work. In other words, a worker may experience high job strain if he or she has high job demands and a low level of decision making. As noted above, this study extends the traditional approach to job demands by also exploring the physical demands and health risks that veterinarians encounter in their work.

The JDC model has two distinct hypotheses. First, Karasek (1979) argues that workers in jobs he labeled as "high job strain" have high demands such as excessive workloads in combination with low job control. These workers will experience negative health outcomes such as stress and depression as compared to workers in low strain jobs. Jobs that have "low job strain" have low demands such as lighter workloads and high job control. Second, Karasek suggests that having

job control can reduce or buffer the harmful effects of high work demands and improve workers' well-being. This means that the amount of job control individuals have over their work demands may moderate the effects of job demands on mental health.

The Job Demand-Control (Support) model, which is an expanded version of the JDC model, suggests that social support is also crucial to the understanding of the mental health of workers (Karasek, Triantis & Chaudhry, 1982). Social support is an interpersonal coping resource where individuals provide assistance to one another (Wallace, 2005). The JDC(S) model hypothesizes that workers who have high demands, high control, and high social support experience better mental health and psychological outcomes. In addition, workers who have excessive demanding work, but high levels of social support will report less harm to their health than workers with low levels of social support.

In summary, the JDC(S) model consists of three core concepts that include: job demands, job control, and social support. These three concepts are used to explain the psychological strain that individuals may feel as a result of their work experiences. Each of these core concepts are discussed in greater detail below.

Job Demands

Over the years, there has been an increasing interest of researchers who study work and its impact on the workers (Devereux, Buckle, and Vlachonikolis, 1999; Goetzel and Ozminkowski, 2008; Schaufeli and Taris, 2014). One major aspect of work that has been studied by many of these researchers is the demands one has at work. Job demands are the stressors that are associated with one's work role and usually requires one's efforts mentally, physically and/or emotionally. Mental demands consist of work that is described as cognitively complex, strenuous and usually requires

working under time pressures. Physical demands refer to job demands that require a worker to perform a physical activity, such as carrying heavy loads or restricted sitting or standing. Emotional demands are work tasks that may involve difficult interpersonal interactions with coworkers or clients (de Jonge, van Vegchel, Shimazu Schaufeli and Dorman, 2010). Most often in the literature, job demands are usually measured as work hours, workload, role conflict or time pressure (Wallace, 2005).

The magnitude of these demands may differ based on one's job and responsibilities in the workplace. Studies suggest that workers may have different job demands (Hu, Schaufeli, and Taris, 2011; Sigurdardottir, Svavarsdottir, and Juliusdottir, 2015; Willemse, de Jonge, Smith, Depla, and Pot, 2012). Studies have examined how excessive job demands may negatively impact on a variety of outcomes, including job satisfaction, job motivation, employee-employer relationship, job turnover, employee safety performance and family-work interference (Fila, Paik, Griffeth and Allen 2014; Hu et al, 2011; Magee, Stefanic, Caputi, and Iverson 2012; Van Yperen, Wortler, and De Jonge, 2016; Wallace, 2005; Willemse et al, 2012; Woerkom, Bakker and Nisshii, 2015).

The major concern of most researchers, however, is how these job demands affect the health of workers. Health, according to the World Health Organisation, is a state of complete physical, mental, and social well-being and not merely the absence of disease (WHO, 1948, 100). Workers with heavy job demands tend to spend most of their time trying to complete their assigned tasks and may, therefore, have less or limited time to rest, leaving them with less energy and feeling unwell. Also, because these demands may be in conflict with other roles that may be assigned during work hours, time spent on one task may prevent other tasks from being accomplished. The feeling of not having enough time or constantly working under time pressures can negatively affect

workers' health (Magee, Stefanic, Caputi, and Iverson, 2012; Schaufeli and Taris, 2014; Tims, Bakker, and Derks, 2013). That is, excessive work demands may cause workers to experience more psychological symptoms such as depression or strain, thus having an adverse effect on their mental health (Canivet, Choi, Karasek, Moghaddassi, Staland-Nyman, and Ostergren, 2012; Deacon and Brough, 2016; Demerouti et al, 2014).

With work time and workload being considered as some of the many potential job demands, recent studies argue that working long hours in order to complete one's work may lead to stress and its accompanying psychological symptoms (Deacon and Brough, 2016; Demerouti et al, 2013; Shirangi, Fritschi, and Holman, 2013). Organisations try as much as possible to meet productivity targets where workers are also required to do same. These demands often put pressure on workers since they may not always be able to control and balance between time available and time needed to complete their work tasks. The inability to manage time and the thoughts of not being able to accomplish many tasks as expected, can be stressful and, therefore, affect the mental health of workers. This is because not only do workers need to get work done, but also, they need to be in a proper state of mind and well-being before another cycle of work begins.

In addition to these time-based job demands are the emotional demands at work. Emotional demands may involve difficult interpersonal interactions with coworkers or clients (de Jonge, van Vegchel, Shimazu Schaufeli and Dorman, 2010). Maslach (1978) argued that professions that deal with people and their problems are more likely to experience emotional strain. Workers who work in an environment which involves regular contact with customers or clients are often confronted with the situation of dealing with issues that arise from such daily encounters. Some of these encounters require that workers providing for the emotional needs of the workers. This form of

work demand may be exhausting and can impact on their mental health (Mastenbroek et al, 2014; Mann and Cowburn, 2005; Thompson, Kirk and Brown, 2005).

Job demands and Veterinarians

Numerous studies have been conducted on the job demands of veterinarians. Their work is seen as very demanding, which may at times require more than regular 9-to-5 work hours, considerable effort for each assigned task, and also on-call duties and off-duty work (Hatch, Winefield, and Lievaart, 2011; Reijula, 2003; Shirangi, Fritschi, and Holman, 2013). Many veterinarians may not only be on duty for animal health care, but also manage their clinic, keep records of activities, supervise and be supervised, and monitor the activities of their coworkers. That is, they may need to be doctors, managers, administrators and accountants at the same time and such demands can impact on their health and also their performance at work (Deacon and Brough, 2016; Mastenbroek, Jaarsma, Demerouti, Muijtjens, Scherpbier and Beukelen, 2013; Reijula, 2003).

In this study, job demands will be examined in terms workload, work hours, dealing with client grief and unrealistic client expectations. Workload is the extent to which individuals feel their job demands are too much or excessive. Work hours is the average number of hours that individuals spend in completing their work tasks in a typical week. Dealing with client grief involves the veterinarian's ability to offer support, caring and understanding to their clients in dealing with difficult emotional issues, concerns or problems. Unrealistic client expectations include the unrealistic demands that clients anticipate and expect from veterinarians when treating and caring for their pets. These are discussed in greater detail below.

Most veterinarians work more than forty hours a week, and often report taking work home, and as a result they may feel considerable time pressures and that their workload is overwhelming (Hansez, Schins and Rollin, 2008; Hatch, Winefield, Christie, Lievaart, 2011; Smith, Leggat, Speare, Townley-Jones, 2009). Researchers suggest that these job demands are sometimes very challenging and may require more effort and commitment from the veterinarians which can impact on their health, particularly their mental health. Research findings support this, showing that veterinarians who have high demands, such as long work hours and high workloads, report poorer mental health (Shirangi, Fritschi, and Holman, 2013; Hatch, Winefield, and Lievaart, 2011). Consequently, veterinarians who have other responsibilities, such as family roles, may experience even more work-family interference because of the perceived time pressure to fulfill both work and family roles. This strain shows how veterinarians, caught in the midst of the tension with no immediate solution to reducing it, may become stressed out, tired, or depressed.

The growing interest in and attachment of owners to their companion animals has also brought new demands to the work experiences of veterinarians. (Reijula, Rasanen, Hamalainen, Juntunen, Lindbohm, Taskinen, Bergbom, and Rinta-Jouppi, 2003). They now have greater emotional demands in terms of meeting client expectations and also empathising with clients in times of loss of pets or pet distress (Hansez et al, 2008; Hatch et al 2011; Platt et al, 2012). Both have been found to be important sources of stress in the veterinary profession (Irvine and Vermilya, 2010). These types of emotional demands reflect that the daily work of veterinarians involves more than ensuring that the animal patient is safe. The veterinarians must also ensure that the human clients leave feeling satisfied about the care and health of their pet (Ogilvie, 2016). This requires a level of emotional maturity where veterinarians can comfort clients and deal with the distress of their clients (Halliwell and Hoskin, 2005). Providing this level of emotional support,

which is described as part of veterinarians' daily work, may have repercussions on their mental health however. Job demands such as client expectations have been found to be related to the mental health of veterinarians as evidenced by veterinarians' frequent visits to a physician, counselor, or a psychiatrist for workload or client-related stress issues (Epp and Waldner, 2012; Reijula, 2003; Shirangi, Fritschi, and Holman, 2008). Based on Karasek's arguments and the findings in the literature, I propose the following hypothesis:

Hypothesis 1: *Greater job demands (workload, work hours, dealing with client grief and unrealistic client expectations) will be related to poorer mental health.*

Job control

According to the JDC model, the job demands workers face at work may cause strain. However, the amount of strain experienced by workers also depends on the level of control they have over their work. As such, the main idea behind the JDC model is that strain does not simple results from job demands, but rather the joint effects of high job demands and low job control. In other words, workers experience strain when they have excessive demands or highly demanding jobs and when they are unable to exercise discretion or make independent decisions (Chiang et al, 2010; Willemse, de Jonge, Smith, Depla and Pot, 2012).

Job control involves the activities that allow workers to have discretion in how they attempt to meet their job demands (Karasek, 1979). Examples of job control are decision-making authority, skill discretion, autonomy, control over work hours and schedule flexibility. Workers who have excessive job demands, but have some form of control over how they attempt to respond to those demands may experience less strain (Karasek, 1979). This is because having the chance to decide on how to complete tasks and carry out one's job responsibilities shows one's influence and control

at work. This enhances feelings of mastery, and enables coping with stressful job demands and conditions (Karasek, 1979). This psychological experience of control over job demands helps to reduce strain and is associated with feelings of depression (Deci, Ryan, Gagné, Leone, Usunov, and Kornazheva, 2001).

This study will examine three specific forms of job control that include: control over workhours, autonomy, and schedule flexibility. Control over work hours involves the extent to which individuals have considerable control over when they work, the number of hours they work, and whether they can decide to take a break at work. Autonomy refers to the extent to which individuals can determine and make decisions about their methods, pace, and efforts to accomplish work. Schedule flexibility involves individuals' being able to take time off if needed to meet other needs apart from work. These three forms of job control are described in greater detail below.

When workers have control over their work hours, they influence or determine how many hours they can work at a point in time and/or when they work those hours, which may reduce job strain (Nordenmark, Vinberg, and Strandh, 2012). Workers who feel they have to work long hours and do not have any form of discretion in deciding how many hours they work or when they work may experience greater job strain (Meier, Semmer, Elfering, and Jacobshagen, 2008; Willemse et al, 2012). The inability to influence how much time they can take to actually complete work tasks increases the job strain they may experience even more (Fransson, Nyberg, Heikkilä, and Alfredsson, 2012). However, when workers can control how many hours they work, the time they spend on each task, and when they perform them, they may be better able to cope with their daily job demands and therefore reduce feelings of job strain (Dawson, O'Brien, and Beehr, 2015; Deci et al, 2001)

Because most aspects of a job involve making decisions about how and when to perform each task, workers who have greater autonomy in making decisions about their work may feel less job strain (Deci et al, 2001; de Jonge, van Vegchel, Shimazu Schaufeli and Dorman, 2010; Karasek, 1979; Van Yperen, Wortler, and De Jonge, 2016). This is because individuals feel positive about themselves when they are able to take control of the situation that may affect them in their work environment. In this sense, the inability to do that usually causes low self-esteem and lack of confidence in one's own ability which can lead to job strain (Chiang et al, 2010). When workers are allowed to make decisions about their work tasks, organisation of work, and pace of work and are also allowed the freedom to decide on how to accomplish their job responsibilities, they are more likely to feel less strain even in situations when they experience excessive job demands.

When workers have a higher degree of flexibility in their schedule, their sense of job control may increase and thus, alleviate job strain (Bakker and Demerouti, 2014; Deci et al, 2001; Willemsse et al, 2012). Workers usually attempt to maintain a balance between work and another aspect of their lives, for instance, family (Frone and Rusell, 1997; Symoens and Bracke, 2015; Wallace, 2005). Because both domains, work and family, are important and decisions made in one can affect how responsibilities are carried out in another, workers who have more control over their schedule, and are able to maintain a flexible one, tend to feel less stressed about their work (Fransson, Nyberg, Heikkilä, Alfredsson, Bacquer, Batty, and Kittel, 2012). Having a flexible schedule may allow workers to take time off in order to take care of other matters apart from work, such as family or personal matters. Achieving a better work-life balance may result in positive feeling about oneself, and reduce the psychological strain associated with their work.

Job control and Veterinarians

As mentioned above, this study will be focusing on three specific forms of job control that veterinarians may exercise: control over work hours, autonomy, and schedule flexibility. Veterinarians who have control over the number of hours they spend at work and in completing their work tasks report feeling less job strain which alleviates psychological stress (Bartram, Yadegarfar, and Baldwin, 2009; Bartram, Yadegarfar, and Baldwin, 2009). In addition, veterinarians who have more autonomy are allowed to make decisions and participate in activities concerning the organisation of their work feel that they have decision-making authority and therefore can influence the outcome of their work activities (Gardner and Fletcher, 2009; Irvine and Vermilya, 2010). As mentioned earlier, when workers have skill discretion where they can decide their skills on how to complete their tasks, there is a feeling of psychological well-being as this improves self-esteem. Thus veterinarians who do not only have a say in what happens at work, but also have the opportunity to decide how to complete their tasks experience less job strain (Gardner and Hini, 2006; Smith et al, 2009). Job control is also examined in studies on veterinary practice in terms of schedule flexibility (Hansez, Schins and Rollin, 2008; Smith et al, 2009). Veterinarians who have flexible schedules may be able to find time for other activities outside the workplace, such as spending time with their family, holidays or relaxation. Veterinarians who have a flexible schedule are able to avoid conflict from different aspects of their lives, especially, from work and family while maintaining a balance which reduces stress (Shirangi, Fritschi, and Holman, 2013). Based on the literature, I propose the following hypothesis:

Hypothesis 2a: *Greater job control (over work hours, autonomy and schedule flexibility) will be related to better mental health.*

Job control and the buffering hypothesis

The JDC model also hypothesizes that individuals who have job control over how they attempt to meet their excessive job demands may experience less job strain. (Karasek, 1979). That is, the level of job control individuals have over their work demands may moderate the effects of job demands on mental health (Bakker and Demerouti, 2014; Lucas, Laschinger, and Wong, 2008). It is predicted that there is a buffering effect of job control where those with more job control are protected from the harmful effects of job demands on their well-being.

Job control provides individuals with a wide range of opportunities where they can put their personal skills to use and also develop a sense of mastery that helps them accomplish their work task (Deacon and Brough, 2016; Karasek, 1979). It is because of this sense of mastery and skill that individuals with more job control experience less strain, even if they have demanding jobs. Research has shown that veterinarians who lack control over the speed of activities and discretion while having excessive work demands have high levels of strain (Deacon and Brough, 2016; Shiringi et al, 2013; Irvine and Vermilya, 2010). In contrast, veterinarians who experience highly demanding work conditions, together with higher levels of job control will not experience as much strain as those with similarly demanding work conditions but lower levels of job control. Based on the foregoing literature, I hypothesize the following:

Hypothesis 2b: Job control will moderate the relationship between job demands and mental health. Specifically, the relationship between job demands and mental health will be weaker for workers with more job control.

Social Support

The original JDC model proposed by Karasek (1979) has been used in many studies to examine the impact of job strain on the mental health of workers. An extension of this model by

Karasek, Triantis, and Chaudry (1982) includes social support as a coping resource. The Job-Demand Control (Support) (JDACS) model seeks to test the impact of job demands on the mental health of workers under different amounts of social support in addition to different amounts of job control. Social support refers to being cared for, loved, esteemed and valued by others and feeling that one belongs to a group where there is a mutual obligation (Cobb, 1976). It is a coping resource viewed as potentially effective in reducing the harmful effects of job stressors and enhancing the well-being of workers. This is because social support may provide individuals with regular positive experience and stability in one's life situations and a recognition of self-worth (Cobb 1976; Cohen and Wills, 1985; Kossek, Pichler, Bodner and Hammer, 2011).

The JDACS model examines the impact of social support on mental health in two main ways: (1) how social support is directly related to the mental health of workers and (2) how social support buffers or protects individuals from potential job stressors that may negatively impact on their mental health. The first hypothesis suggests that individuals with some level of social support will have improved health and well-being (Wallace, 2004). The second hypothesis suggests that social support may reduce the strength of the association between job demands and feelings of strain, thereby by buffering, or moderating, the harmful effects of job stressors (Karasek et al., 1982). Either way, social support is expected to enhance the health and well-being of workers.

Social support has been examined in a number of ways, but the most common measure is emotional support (Cattell, Bowen, and Edwards, 2016; Gardner and Hini, 2006; Ng and Sorensen, 2008; Wallace, 2005). Emotional support is when individuals show care and concern for others. Here, individuals are available to listen and understand as well as provide sympathy and empathy with those in a stressful situation (Ganster, Fusiller, and Mayes, 1986). A growing body of research on work and health demonstrates that emotional support received from coworkers is related to the

mental health of workers (Collins, 2008; Kossek et al, 2011; Wood, Maltby, Gillett, Linley and Joseph, 2008). Workplace social support is the degree to which individuals perceive that they are valued and cared for by workplace sources such as supervisors, co-workers and the organisation (Kossek et al, 2011). The perception that these sources provide help enhances workers' mental health. Workers who perceive that they have social support from their supervisors or coworkers when they have high demands experience less job strain and are more likely to report an improved well-being (Chen, Siu, Lu, Cooper and Phillips, 2009; Ng and Sorensen, 2008; Pronost, Le Gouge, and Leboul, 2010). This is because the support provided by these sources, usually as assistance, informative, encouraging participative management or understanding the dilemma of workers, may alleviate the job strain that they would have otherwise experienced because of their job demands. The level of workers' social support, therefore, influences the extent to which their job demands contributes to job strain. The more support they have, the less strain they experience from their work and the better quality of work life they will have in their work environment (Kossek et al, 2011).

This study will be focusing on one specific type of social support, that is, emotional support from coworkers. Emotional support provided by coworkers involves listening to each other's work-related problems, showing concern, empathising with each other's stress and offering support and encouragement. When coworkers show concern over how others are completing their work tasks and try to offer support in a form of encouragement, they help reduce job strain that can be experienced by their coworkers (Pronost et al, 2010; Sacco, Bulchoz, and Harrington, 2014). The perception that excessive demands are the individual's sole responsibilities can be a job stressor that increases job strain. However, when they know that their coworkers are available

to listen and encourage them in stressful situations, they have low psychological job strain and improved mental health (Catell et al, 2016).

In addition, when workers meet and spend time to talk about each other's work and its related problems, they are able to empathise with each other. This is because frequent contact with each other might help pass time and reduce the opportunities for distress and anxiety, which are usually associated with high job strain (Steiner and Wooldredge, 2015). Thus, this type of support from coworkers conveys a message of affection and a feeling of being valued in the workplace by others. It may result in positive feeling about oneself, and reduce the psychological strain associated with their work.

Social Support and Veterinarians

Veterinary practice often involves monitoring one's own work and also that of colleagues and subordinates as they usually work together in relatively small teams and/or work settings (Deacon and Brough, 2016; Foster and Maples, 2014; Shirangi, Fritschi, and Holman, 2013). As mentioned above, this study will be focusing one type of work-related social support that veterinarians may receive: emotional coworker support. Veterinarians who have emotional support from their coworkers and feel they are offered encouragement in times of distress related to their work demands report feeling less job strain (Foster and Maples, 2014). Because some veterinarians deal with both animal patients and human clients at the same time, emotional job demands can be overwhelming and have a negative impact on the well-being. Also, they may have to deal with the deaths of patients, which can be disheartening, even though it is a possible outcome in their profession (Foster and Maples, 2014; Platt, Hawton, Simkin, Dean, and Mellanby, 2012). However, having coworkers who empathise with them in such stressful moments and listen to their work-related problems means that they have a supportive work environment and are less likely to

experience high psychological job strain (Gardner and Hini, 2006). Based on these arguments and the findings in the literature, I propose the following hypothesis:

Hypothesis 3a: *Greater social support (emotional coworker support) will be related to better mental health.*

Social Support and the buffering hypothesis

As indicated above, the extension of the JDC model to include social supports suggests that the level of social support individuals have in dealing with their work demands may moderate the effects of job demands on mental health (Chen et al, 2009; Ng and Sorensen, 2008; Sacco et al, 2014). Social support, therefore, may have a buffering effect where those with high levels of social support are protected from the harmful effects of job demands on their mental health. Similarly, veterinarians who experience highly demanding work conditions, together with higher levels of social support from coworkers may experience low strain. Their high levels of social support protect them from experiencing high job strain even though they may have excessive work demands. This will, therefore, alleviate high psychological strain. Based on the foregoing literature, I hypothesize the following:

Hypothesis 3b: *Social support will moderate the relationship between job demands and mental health. Specifically, the relationship between job demands and mental health will be weaker for workers with more social support.*

Gender differences in work experiences

Research also suggests that men and women may experience different levels of distress at the workplace due to differential exposure to job stressors (Angst et al, 2002; Roxburgh, 1996). Though men and women in this profession may report experiencing physical demands and health

risks (Reijula, 2003; Shirangi, Fritschi, and Holman, 2008), it is unclear whether or how the effects of demands, control and support may differ for the mental health of men and women. In this study, I will empirically explore the possibility of gender differences in two ways. First, mean difference tests will be carried out to see if male and female veterinarians differ in the amounts of job demands, control and support they experience in their work. Second, the effects of the variables on men and women's mental health is examined by conducting a series of gender interaction tests.

Over the years, gender differences in occupational distributions have led to a number of studies examining how the difference may impact on wages, workplace discrimination, and health. This has revealed quite a number of interesting gender differences at work (Irvine and Vermilya, 2010; Lofstedt, 2003; Mannetje, Mclean, Loschmann, Cheng and Pearce, 2011; Yakubovich, 2005; Kmec 2005). While veterinary profession continues to see an increase in the number of female veterinarians (Lincoln, 2010), it is unclear whether female veterinarians are exposed to the same work experiences as male veterinarians, and in particular the same physical demands and health risks. This is because some of these work experiences are quite unexpected in feminine professional work as it is often described as not being physical or dangerous. This thesis will therefore conduct analysis to find out if there are any gender differences in the work experiences of veterinarians.

Physical demands and Health risks

One of the contributions of this study is that the concept of job demands will be expanded to include the physical demands and health risks that veterinarians may experience in their work. Most studies tend to limit their focus of job demands to excessive workload in terms of time pressures and time spent at work. Physical job demands consist of work activities that may involve lifting, standing, or carrying heavy loads. Research that has focused on the effects of physical

demands on worker health has found that these demands affect the musculo-skeletal system of the human body and can cause psychosomatic health complaints and sickness-related absences among workers (de Jonge et al, 2010).

Health risks at work, which refer to work tasks that expose individuals to serious illnesses, have become an increasingly important topic as well. Accidents and illnesses that occur at the workplace have been linked to greater exposure to health risks (Cioni and Savioli, 2015). In some occupations, exposure to health risks may include excessive noise, dangerous equipment, poor lighting conditions, radiation, chemicals, gases, and slippery surfaces (Hill, Langley and Morrow, 1998; Jeyaretnam and Jones, 2000; Phillips, Jeyaretnam, and Jones, 2000; Reijula et al, 2003).

Physical demands and Health risks Among Veterinarians

Professional work is usually recognized as emotional or cognitively demanding and not associated with physical demands and health risks. However, professional work, such as the practice of veterinary medicine, requires more than just the brain, but also the proper physical functioning of the workers. Not only that, veterinarians are also often required to work in an environment that exposes them to various health risks (Reijula, 2003). Examples of health risks that veterinarians may experience are exposure to chemicals, gases, risk of injury and exposure to radiation. While there are studies that have examined various physical demands and health risks and hazards associated with veterinary practice (Jeyaretnam and Jones, 2000; Jeyaretnam, Jones and Phillips, 2000; Hill, Langley and Morrow, 1998), they have limited their focus to their effects on veterinarians' physical health (de Jonge et al, 2010; Fritschi, Shirangi, Robertson, and Day, 2008; Jeyaretnam and Jones, 2000). There has been less attention examining physical demands and health risks and their impact on mental health, which is the focus of this study.

A veterinarian's work often involves more than office work. It often involves physically demanding and dangerous activities that can be harmful to their well-being. For example, Reijula's (2003) study on veterinarians showed that more than a third of veterinarians worked in improper postures, bent over, or with their back otherwise twisted for more than an hour each day. Not only are they experiencing physical strain due to their work demands, but they are often working in an environment where they are exposed to pesticides and anesthetic gases such as isoflurane, halothane, and nitrous oxide, which can cause respiratory irritation and also harm a worker if the chemicals are handled improperly (Hill, Langley and Morrow, 1998). Veterinarians may be exposed to work-related injuries from both animals and the equipment they use. For example, studies report that veterinarians describe how they have been bitten by a dog or snake, experienced head injury from a camel or horse kick, or scratched as a result of restraining animals during x-ray procedures (Hill, Langley and Morrow, 1998; Jeyaretnam and Jones, 2000). Furthermore, many veterinarians report having equipment-related injuries at work that may involve, for example needles, scalpels or calf pulling equipment (Jeyaretnam and Jones, 2000). Hill et al (1998) found that needle sticks were the most frequent injury reported, where 87% of the veterinarians in their study reported experiencing one or more needle injuries which sometimes required medical treatment. While the veterinarian's goal may be to provide the best care solution for both the client and patient, it is worth noting that they may be at risk of experiencing heavy physical demands and serious health risks.

Research on veterinarians' mental health has focused largely on traditional job demands, such as work hours and workload, and their impact (Fritschi, Shirangi, Robertson, and Day, 2008; Gardner, and Hini, D. 2006; Shirangi, Fritschi, Holman, and Morrison, 2013). Little attention has been given to the impact of physical demands and health risks to veterinarians' mental health even

though these demands may also be part of their everyday work activities. The main focus of this study is therefore to expand the JDC (S) model by including physical demands and health risks relevant to veterinarians' work experiences. Specifically, this study seeks to examine whether physical demands and health risks in a professional occupation, such as veterinary practice, lead to job strain. This will involve examining if they impact on mental health, and whether veterinarians who have greater job control and social support will experience a less harmful impact of these demands on their mental health. I will be focusing on several specific physical demands and health risk variables relevant to veterinary practice. The physical demands include a single variable that taps improper lifting and improper posture. The health risk variables are examined in terms of three specific variables: (1) risk of illness and injury; (2) exposure to gases, chemicals or solvents; and (3) exposure to radiation.

Hypothesis 4a: Greater physical demands (improper posture and lifting) and health risks (risk of injury and illness, exposure to gases, chemicals or solvents, exposure to radiation) will be related to poorer mental health.

Hypothesis 4b: Job control will moderate the relationship between physical demands, health risks and mental health. Specifically, the relationship between physical demands, health risks and mental health will be weaker for workers with more job control.

Hypothesis 4c: Social support will moderate the relationship between physical demands, health risks and mental health. Specifically, the relationship between physical demands, health risks and mental health will be weaker for workers with more social support.

The figure below provides a conceptual model of the hypothesized relationships among these variables.

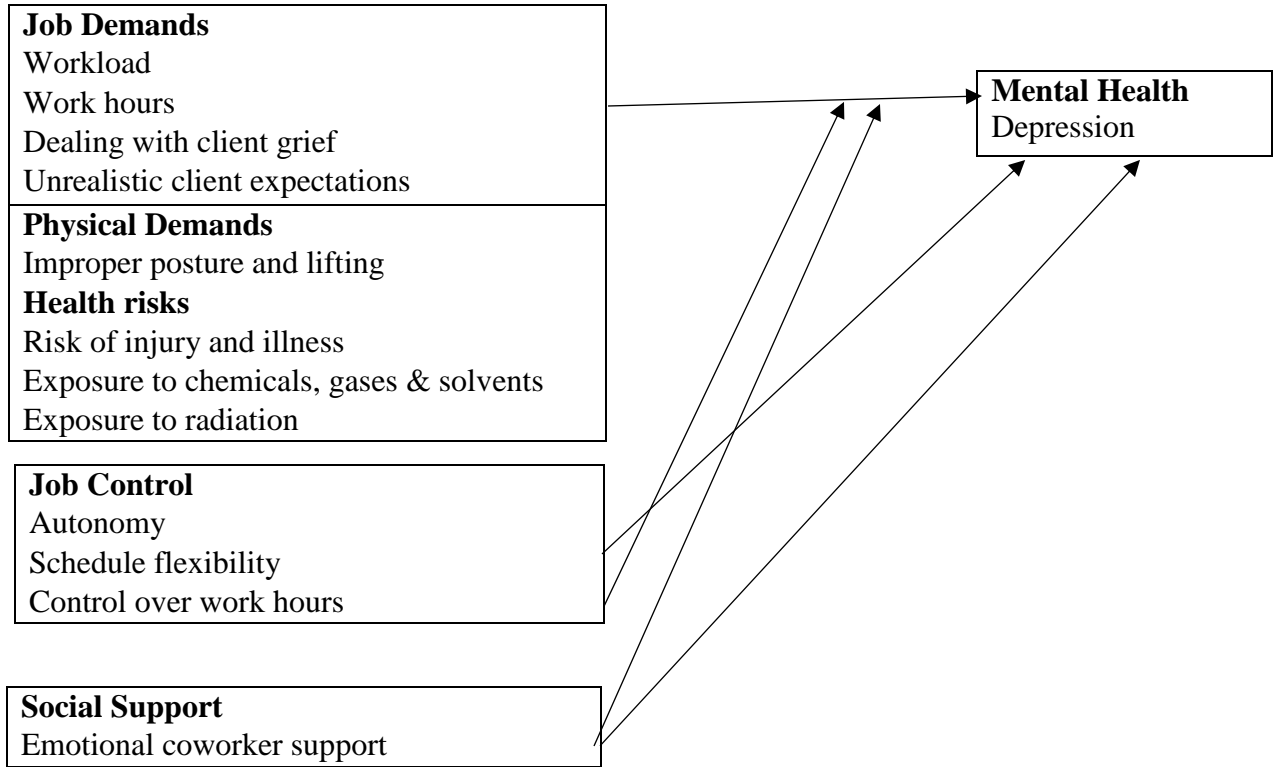


Figure 1: Conceptual model of hypothesized relationships between job demands, job control, social support and mental health

In summary, this thesis examines the relationship between specific work activities and veterinarians' mental health. It includes additional occupation-specific job demands to the JDC(S) model by examining whether two types of job demands (physical demands and health risks) impact on veterinarians' mental health. It is hypothesized that high job demands will be related to poorer mental health. It is also hypothesized that job control will relate to better mental health and that job control will moderate the relationship between job demands and mental health. In addition, it is hypothesized that social support will be related to better mental health and that social support will moderate the relationship between job demands and mental health. Finally, it is also hypothesized that physical demands and health risks will be related to poorer mental health, and social support and job control will moderate the relationships between these demands and veterinarians' mental health.

Chapter 3 - Data and Methods

This chapter summarizes the data source, sample, measures, and statistical procedures used to examine and estimate the relationships between veterinarians' work experiences and their mental health. I discuss the source of the data as well as the sample that was chosen for this study. Next, I describe the measures for each of the variables and the statistical procedures that were used to test the hypotheses presented above.

Data source

This thesis used secondary survey data collected from a sample of veterinarians who are members of the Alberta Veterinary Medical Association (ABVMA). The purpose of the survey was to assess factors that have positive and negative impacts on the ABVMA members' well-being. Electronic ABVMA newsletters were circulated in April and May 2013 and invited all 1401 veterinarians registered with the ABVMA to participate in an online questionnaire. In total, 537 veterinarians completed the questionnaire, yielding a response rate of 38 percent. A comparison with the provincial figures from the ABVMA indicates that similar proportions of veterinarians are represented in the sample by gender, years of experience, and work setting.

For this thesis, the sample is restricted to include only veterinarians in clinical practice (N=378), which includes those working in small, mixed, or large animal practice and most of the original sample. This subsample was chosen because of the focus of my study such that physical demands and health risks are more relevant to those in clinical practice than other employment settings such as a university, government or industry. As a result, my data included information from 378 veterinarians and was comprised of 94 (25%) men and 247 (65%) women.

Measures

This section examines the measures included in the analysis. First, it discusses the reliability and validity of the measures used in the study. Next, it examines the conceptualisation and operationalisation of the variables used. The measure of the dependent variable, mental health is examined first, followed by the description of the independent variables. Unless otherwise indicated, the scale items included responses that ranged from never (coded 1), not very often (coded 2), sometimes (coded 3), often (coded 4) and most of the time (coded 5). If summated scale scores needed to be generated for multiple-item measures, the values were summed and divided by the total number of items in the scale to generate a mean score for that variable. Since the scales contained missing cases where some respondents did not provide responses for all items, respondents are included if they completed the majority of items in each scale. Their mean score is then based on their responses to these items.

Reliability and validity

It is important that the validity and reliability of the measures are assessed to ensure that they represented the concepts in this study and also to allow for generalisability of the results for this sample. Reliability is concerned with measures producing consistent results over a period of time as well as maintaining internal and inter-observer consistency (Bryman and Edward, 2016). Cronbach's alpha (α) was used to assess the reliability or the internal consistency of the items for the multiple-item scales. It reflects how closely related a set of items are as a group. The resulting α coefficient of reliability ranges from 0 to 1 and an alpha level of .70 or higher represents a good reliability (Nunnally, 1978). Obtaining higher alpha values indicates greater intercorrelation or reliability among the measured items (Spector, 1992). Table 1 presents the descriptive statistics,

including means, standard deviations, and ranges, as well as the alpha coefficients where applicable.

Validity, on the other hand, is ensuring that one is measuring what is intended to be measured. In this case, the measure must appear to reflect the content of the concept in question, must correlate with criterion thought to be relevant to the concept and the concepts used in the research must relate to each other in a way that is consistent with the study's theory (Bryman and Edward, 2016). In this study, the face validity, which refers to the items reflecting the content of the concepts as they are used in the literature, was assessed. Construct validity was also assessed to ensure that the concepts used in the study are related to each other in a way that is consistent with the study's theory. According to Spector (1992), testing for construct validity involves assessing the strength and direction of the relationship between measures of different variables. Examination of the correlation matrix (see Table 1) is one way to assess the construct validity of the measures used in the analysis. In addition, factor analysis was used to construct new scales for some specific variables in the study. Factor analysis is conducted when items are expected to have similar patterns of responses that reflect a common underlying construct. This is done by collapsing the observed items into new scales. This also helps to prevent issues of multicollinearity.

Table 1 *Descriptive Statistics for All Variables Included in the Analysis (N =378)*

Variables	No. of Items	Mean	SD	Range
Dependent variable				
Depression	7	1.59	1.42	0 – 6.57
Job Demand variables				
Workload	5	3.58	0.89	1 - 5
Work hours	1	40.55	13.15	5 - 88
Dealing with client grief	1	3.03	0.79	1 - 5
Unrealistic client	1	3.58	0.73	1 - 5
Job Control variables				
Autonomy	4	3.88	0.76	1.75 - 5
Schedule flexibility	1	3.09	1.07	1 - 5
Control over workhours	3	3.02	0.99	1 - 5
Social Support variable				
Coworker support	4	3.67	0.77	1.25 - 5
Physical demands and health risks				
Improper posture and lifting	2	2.91	0.88	1 - 5
Injury and illness	3	2.52	0.68	1 - 5
Exposure to chemicals	1	2.45	0.89	1 - 5
Exposure to radiation	1	2.51	0.94	1 - 5
Control variables				
Sex (Male=1)	1	0.28	0.43	0 - 1
Marital status (Married=1)	1	0.67	0.47	0 - 1
EmploymentStatus(Full Time=1)	1	0.77	0.42	0 - 1
Income	1	4.14	1.69	1 - 8
Number of veterinarians	1	1.98	0.69	1 - 3
Years of experience	1	14.34	10.32	0 - 59
Type of practice	1	0.31	0.46	0 – 1

Table 2 *Zero-Order Correlations for the Variables Used in the OLS Regressions*

	1	2	3	4	5	6	7
1. Depression	1.00						
2. Workload	0.37*	1.00					
3. Work hours	0.14*	0.29*	1.00				
4. Dealing with client grief	0.29*	0.28*	0.03	1.00			
5. Unrealistic clients	0.19*	0.13*	0.06*	0.16*	1.00		
6. Autonomy	-0.23*	-0.07*	0.02	-0.09*	-0.00*	1.00	
7. Schedule flexibility	-0.35*	-0.46*	-0.27*	-0.24	-0.08*	0.05	1.00
8. Control over workhours	-0.30*	-0.23*	-0.21*	-0.19*	-0.09*	0.59*	0.24*
9. Coworker support	-0.27*	-0.20*	-0.09*	0.07*	-0.22*	0.00*	-0.29*
10. Improper posture and lifting	0.37*	0.34*	0.12*	0.29*	0.15*	-0.22*	-0.26*
11. Injury and illness	0.31*	0.27*	0.21*	0.28*	0.08*	-0.17*	-0.21*
12. Exposure to chemicals	0.18*	0.14*	0.02	0.25*	0.25*	0.09*	-0.15*
13. Exposure to radiation	0.23*	0.19*	0.11*	0.24*	0.16*	-0.15*	-0.14*
14. Sex (Male=1)	-0.13*	-0.07*	0.22*	0.08*	-0.06	0.18*	-0.02
15. Marital (Married=1)	-0.09*	0.03	-0.08*	-0.04*	0.08*	0.14*	0.02
16. Income	-0.11*	0.11*	0.32*	0.02	-0.02	0.31*	-0.09*
17. Number of veterinarians	-0.03	0.14*	0.02	0.08*	-0.01	-0.22*	0.12*
18. Years of experience	-0.15*	-0.13*	-0.15*	-0.10*	0.05	0.31*	0.00
19. Type of practice	0.05*	0.03	0.20*	-0.11*	-0.17*	0.11*	-0.08*
20. Employment status	0.09*	0.13*	0.66*	-0.02	0.02	0.03	-0.17*

* $p < 0.05$

Table 2 *Zero-Order Correlations for the Variables Used in the OLS Regressions (Continued)*

	8	9	10	11	12	13	14
1. Depression							
2. Workload							
3. Work hours							
4. Dealing with client grief							
5. Unrealistic clients							
6. Autonomy							
7. Schedule flexibility							
8. Control over workhours	1.00						
9. Coworker support	0.18*	1.00					
10. Improper posture and lifting	-0.34*	-0.19*	1.00				
11. Injury and illness	-0.31*	-0.18*	0.48*	1.00			
12. Exposure to chemicals	0.23*	0.19*	0.33*	0.38*	1.00		
13. Exposure to radiation	-0.31*	-0.09*	0.32*	0.34*	0.53*	1.00	
14. Sex (Male=1)	0.23*	-0.12*	-0.16*	-0.05*	-0.13*	-0.11*	1.00
15. Marital (Married=1)	0.10*	0.04*	-0.11*	-0.06*	0.09*	-0.06*	0.13*
16. Income	0.16*	-0.06*	-0.10*	0.04*	-0.15*	-0.15	0.34*
17. Number of veterinarians	-0.19*	0.07*	-0.09*	-0.00	-0.00	-0.06*	-0.13*
18. Years of experience	-0.47*	-0.03	-0.23*	-0.17*	-0.06*	-0.19*	0.35*
19. Type of practice	0.07	0.02*	-0.02	0.26*	-0.03	-0.06*	0.14*
20. Employment status	0.18*	-0.11*	-0.07*	0.16	-0.02	0.03	0.19*

* $p < 0.05$

Table 2 *Zero-Order Correlations for the Variables Used in the OLS Regressions (Continued)*

	15	16	17	18	19	20
1. Depression						
2. Workload						
3. Work hours						
4. Dealing with client grief						
5. Unrealistic clients						
6. Autonomy						
7. Schedule flexibility						
8. Control over workhours						
9. Coworker support						
10. Improper posture and lifting						
11. Injury and illness						
12. Exposure to chemicals						
13. Exposure to radiation						
14. Sex (Male=1)						
15. Marital (Married=1)	1.00					
16. Income	0.09*	1.00				
17. Number of veterinarians	-0.03	0.11*	1.00			
18. Years of experience	0.13*	0.22*	0.23*	1.00		
19. Type of practice	0.03	0.02	0.06*	0.04*	1.00	
20. Employment status	0.08*	0.35*	0.04*	0.19*	0.12*	1.00

* $p < 0.05$

Mental health (Depression)

Mental health can be understood as the extent to which an individual experiences psychological and emotional well-being. It was measured using Ross and Mirowsky's (1989) shortened version of the Centre for Epidemiology Studies' Depression (CES-D) scale. Seven items were used to indicate how many days in the past week respondents': 1) felt they just could not get going, 2) felt sad, 3) had trouble getting or staying asleep, 4) felt that everything was an effort, 5) felt lonely, 6) felt they could not shake the blues and 7) had trouble keeping their mind on what they were doing ($\alpha = 0.89$). Responses ranged from 0 to 7 days. This depression scale is often used as a measure of mental health where the scale measures symptoms of depression in a general population (Dozeman, van Schaik, van Marwijk, Stek, van der Horst, and Beekman 2011; Kim, Huang, and Chiriboga 2011; Smarr and Keefer, 2011; Zhang, O'Brien, Forrest, Salters, Patterson, Montaner, and Lima, 2012). Higher scores on the depression scale indicate poor mental health whereas lower scores represent better mental health.

Job demand variables

Two variables were used to assess time-related job demands associated with veterinary work. *Workload* is the extent to which individuals see their job demands as too much or excessive. This was measured by five Likert items selected from Caplan, Cobb, and French's (1975) and Marks and MacDermid's (1996) Workload scale and assessed how often respondents': 1) do not have enough time to get everything done, 2) need more hours in a day to do all of the things that are expected of them, 3) often overextend themselves in order to finish everything they have to do, 4) often feel rushed in their work and 5) have too many demands on their time ($\alpha = 0.92$). *Work hours* is the average number of hours a week that individuals practicing clinical veterinary medicine spend completing tasks at the office. This was assessed using a single item that asks

respondents how many hours they work in a week including evenings and weekends. The responses for this variable ranged from 5 to 88 hours per week.

Emotional demands are work tasks that involve difficult interpersonal interactions with others (de Jonge, van Vegchel, Shimazu Schaufeli and Dorman, 2010). Two items were adapted from Bartram et al.'s (2009) *General Veterinarian Work and Clinical Stress* items that indicate how often veterinarians experience: 1) *unrealistic client expectations* and 2) *dealing with client grief*.

Job control variables

Job control refers to the opportunity workers have to make decisions about their work and have discretion in using their skills and abilities. Job control is assessed by the following variables: autonomy, control over work hours and schedule flexibility. *Autonomy* was measured by using Knudsen et al.'s (2003) four-item scale where respondents indicated how often: 1) they have a lot of say over what happens in their work, 2) their work allows them freedom to decide how they do their work, 3) they make a lot of decisions on their own and 4) in their work, they take part in decisions that affect them ($\alpha = 0.82$).

Control over work hours was measured by Wallace's (1993) three-item measure. Respondents were asked how often: 1) they have considerable control over when they work hours they do, 2) they have considerable control over the number of hours they work, and 3) they can decide when to take a break at work ($\alpha = 0.79$).

Schedule flexibility was measured using Holtzman and Glass's (1999) single item that assesses how often respondents find it very hard to take time off of work to take care of personal or family matters. It was reverse coded so that a higher score reflects more schedule flexibility.

Social Support

Social support is a form of an interpersonal coping resource where an individual receives assistance from others (Wallace, 2005). In this research, the social support variable that was assessed is *emotional coworker support*. It was adapted from Ganster, Fusilier and Maye's (1986) scale that asks respondents how often: 1) coworkers listen to their work-related problems, 2) empathize with their stresses, 3) show concern, and 4) offer support and encouragement ($\alpha = 0.87$).

Physical Demands and Health Risks

The following sets of variables are the variables included in the JDCS model. These variables reflect the wider array of work demands that veterinarians may encounter in their work.

Physical demands

Physical demands refer to the physical strain of tasks individuals perform in the workplace. Two items adapted from Reijula et al.'s (2003) physical work environment scale were combined to measure physical demands: improper lifting and improper posture. Both were measured by asking respondents how often they experience these physical demands in their work in a regular work week ($\alpha = 0.77$).

Health risks

Health risks refer to work demands that expose individuals to serious health risks or potential illnesses. Five items adapted from Reijula et al. (2003) were used to assess health risks associated with veterinary work: exposure to gases, chemicals or solvents, exposure to radiation, risk of illness and risk of minor and serious injury. Results from factor analysis conducted on the items led to a summation of the three items including risk of illness, minor and serious injury into

a single measure: *Risk of Injury and illness*. ($\alpha = 0.72$). *Exposure to gases, chemicals and solvents* and *exposure to radiation* however remained as two separate single item measures.

Control variables

Seven control variables were included in this analysis. These seven variables were included to ensure that the relationships between the predictors and mental health do not result from potentially spurious variables (Stinchcombe, 1968). *Sex* was coded as a dummy variable with male coded 1 and female coded 0. *Marital status* was measured by asking respondents to choose which status best described their present situation. Responses included: *single/never married*, *cohabitating/common law*, *married*, *separated*, *divorced*, *widowed* and *remarried*. The responses were recoded into a dummy variable where *married*, *cohabitating*, *common law* were coded 1 and all others were coded 0. *Employment status* was measured as a dummy variable focusing on whether respondents work part-time and full-time. *Full-time* was coded 1 and *part-time* were coded 0. *Years of experience* was measured as a single item asking respondents how many years they have been in this profession. *Income* was measured by asking respondents what their total 2012 annual earnings was as a veterinarian before taxes and deductions were made. The responses ranged from *\$25,000 or less* (coded 1), *\$25,001 to \$50,000* (coded 2), *50,001 to 75,000* (coded 3), *\$75,001 to \$100,000* (coded 4), *\$100,001 to \$125,000* (coded 5), *\$125,001 to 150,000* (coded 6), *\$150,001 to \$200,000* (coded 7), and *more than \$200,000* (coded 8). *Type of practice* were measured by a single item that asked respondents their main type of employment setting, that is the one they usually spend the most hours at each week. This item was dummy coded where responses for *small animal practice* were coded 0, and *large animal practice or mixed practice* were coded 1. *Number of veterinarians* was measured by a single item that asked respondents the number of veterinarians they work with in their immediate workplace. Their responses ranged

from 0 to 100. As noted below, this variable was recoded to normalize its highly skewed distribution such that 0 to 1 was coded 1, 2 to 4 coded 2 and 5 to 100 coded 3.

Statistical Procedures

This section describes the statistical procedures used in this study. First, I provide an explanation for the regression diagnostics used in this study and how they are tested. This is followed by a description of the statistical procedures, including descriptive analyses and multiple regression analyses used to test the hypotheses in this study.

Regression diagnostics

Regression diagnostics are techniques conducted to explore potential problems that compromise a regression analysis and also for determining whether certain assumptions appear to have been met (Fox, 1991). Diagnostics were conducted to check whether the data used in this study met the assumptions of linearity, normal distribution, heteroscedasticity, and multicollinearity. These diagnostics were used to examine univariate distributions and bivariate plots and to minimise errors and assumption violations. The diagnostic procedures used in this study are discussed in greater detail below.

Scatterplots of depression against each of the independent variables were examined to detect any extreme non-linearities and identify influential cases. This helped to test the assumption of linearity. Allison (1999) suggests that ordinary least squares regression assumes a linear relationship between the independent and dependent variables. Scatterplots of depression against the independent variables were conducted and examined. None of the them showed any extreme non-linear relationship and as such, did not violate the assumption of linearity.

Normal distribution of each variable was assessed using stem and leaf plots, and statistical tests that check for skewness and kurtosis. The stem and leaf plots of each variable helps detect wild data values, outliers and highly skewed distributions (Fox, 1991). Skewness is a measure of symmetry of a distribution or the amount to which a distribution departs from a symmetric shape. Acceptable skewness scores range from -2 to +2. Kurtosis is a measure of whether the data are heavy-tailed or light-tailed relative to a normal distribution (Colwell and Carter, 2012). That is, data with high kurtosis tend to have heavy tails or outliers. Acceptable kurtosis scores range from -3 to +3.

From the tests conducted, almost all of the variables had distributions with few outliers and were not highly skewed. In other words, although they were not perfect normal distributions, they did not violate any assumptions pertaining to skewness and kurtosis. However, one variable was not normally distributed, which was therefore transformed by recoding the values in order to normalise the distribution. The variable, *Number of veterinarians* had a high kurtosis score of 8.90 and a high skewness score of 2.32, which indicated a heavy tail and outliers. To correct this, the responses for this variable were recoded. The responses that ranged from 0 to 1 were coded as 1, 2 to 4 were coded as 2 and 5 to 100 were coded as 3. This helped reduce its skewness (skewness score = 0.03) and high kurtosis (kurtosis score = 2.08) and also normalised the distribution.

Another assumption of concern is the issue of heteroscedasticity. This is the degree of random noise in a linear equation that varies with the values of the independent variables. The opposite of this is homoscedasticity which is when the linear equation assumes same variance or the degree of random noise regardless of the values of the independent variables (Allison, 1999). Having issues of heteroscedasticity indicates inefficiency where least squares estimates do not have minimum standard errors and also have biased standard errors. This can lead to bias in test

statistics and confidence levels (Allison, 1999; Fox, 1991). Heteroscedasticity was tested by examining plots of studentized residuals against Y predicted (depression). This helps reveal a tendency of the error variance to change with the level of the dependent variable. It helps produce accurate p values and the assumption of homoscedasticity is met (Allison, 1999). A test to examine issues of heteroscedasticity was run on all of the variables in this study. The results showed that all the variables meet the assumption of homoscedasticity.

Issues of multicollinearity were also assessed. Multicollinearity occurs when at least two of the independent variables in a regression analysis are very highly correlated or related to each other (Allison, 1999). Although multicollinearity may not violate any assumption, it becomes difficult to obtain statistically significant coefficients of the variables that are collinear. To assess this issue, two approaches may be used: examination of zero- order correlations between each of the independent variables and examination of variance inflation factors (VIFs). Zero-order correlations that are above 0.80 are seen as problematic (Mehmetoglu and Jakobsen, 2017). Variance inflation factors show how the variance has been inflated, where VIFs greater than 5.0 for any variable are also seen as problematic (Mehmetoglu and Jakobsen, 2017). The VIFs for the variables were computed and examined. They were however found to be non-problematic. The zero-order correlations between each of the independent variables were also examined for multicollinearity and none exceeded .80 (see Table 2). Thus, the assumption of no multicollinearity was met in this study.

Finally, to test that the errors are evenly distributed, quantile-normal plots of studentized residual (qnorm) were constructed and assessed. This is assessed because some types of error distributions, for instance, heavy-tailed distributions, decrease the efficiency of the least square estimator markedly (Fox, 1991). This is because heavy tailed distributions may lead to more

outliers. The quantile-normal plot therefore allows to compare visually the cumulative distribution of an independent random sample (that is the studentized residuals) to a cumulative reference distribution. The plots constructed in this study showed that there were a few outliers but do not lead to any major concern (Allison 1999; Fox 1991). Also, Fox (1991) suggests that studentized residuals that are relatively large and outside the range of -2 to +2 should be of concern. However, results from the studentized residuals showed that few cases in the dataset were found to have high residuals which reduces concern over discrepant observations (Fox, 1991).

Statistical analyses

A number of statistical analyses were employed in order to test the proposed hypotheses described above. These analyses were conducted using STATA (version 14). These included ordinary least squares (OLS) multiple regression, ttests for difference, and tests for interaction effects. Because all the hypotheses tested in this study are directional, one-tailed tests with alpha values of 0.05, 0.01 and 0.001 are used to determine the level of statistical significance. However, two-tailed test are used to determine the non-directional test such as the gender difference. Each level of significance is indicated with different numbers of asterisks. Using a one-tailed test for directional tests provides more opportunity to detect the power of an effect as compared to a two-tailed test (Allison, 1999).

Two different analyses were carried out to explore gender differences in the work experiences and their effects on male and female veterinarians' mental health. First, t-tests were be conducted to explore whether men and women experience different amounts of job demands, job control, social support, physical demands and health risks. There were also interaction test conducted in order to explore whether these variables are differently related to men's and women's mental health. Each measure was multiplied by the moderating variable, gender, to create eighteen

interaction terms (e.g., *gender x workload*, *gender x work hours*, etc.) (Allison,1999). Next, a number of regression analyses which included the interaction terms and the main effect forms of the independent variables were conducted. The coefficients for the interaction terms were then examined to determine whether they were significant at alpha levels of 0.05, 0.01, and 0.001 (one-tailed test). Significant interaction terms indicate that the independent variables are differentially related to men's and women's mental health.

OLS multiple regression was used to test Hypotheses 1 through 4 and the results are presented in the Tables 3 and 4. OLS multiple regression is a statistical method used to study the relationship between a single dependent variable and one or more independent variable (Allison, 1999). Using multiple regression helps the researcher to make predictions about the dependent variable based on the observed values of the independent variables (Allison, 1999; Healey and Prus, 2015). Also, it allows the researcher to test whether a particular independent variable is significantly related to the dependent variable and to estimate the magnitude of the relationship while controlling for other independent variables in the analysis (Allison, 1999).

The coefficients obtained through the analyses help us understand each variable's unique contribution to the variance explained in the dependent variable. Two different regression coefficients are analysed: unstandardized (*b*) and standardized (β) regression coefficients. Unstandardized coefficients help predict the strength and direction of the relationship between the dependent variable and the independent variable based on their units of measurement (Allison, 1999). Standardized coefficients are coefficients in units of standard deviations and not the specific units of measurements (Allison, 1999). Standardized coefficients provide a common metric across variables to allow the researcher compare coefficients for different variables that are measured in different units. Standardized coefficients enable the researcher to determine how many standard

units the dependent variable changes with an increase of one standard unit in the independent variables (Allison, 1999). By doing this, the researcher can compare the magnitude of coefficients across different variables within a single equation (Allison, 1999).

To ensure the best fit of the model, the coefficient of determination also known as the R^2 is assessed. This assessment allows the researcher to determine the amount of variance in the dependent variable that can be explained by all of the independent variables as a group (Allison, 1999; Healey and Prus, 2015). R^2 values range between 0 and 1 where larger values indicates a better model fit (Allison, 1999). In this study, R^2 values are used to determine how much of the variance in depression is explained by all of the independent variables included in the equations. This is used together with the standardized coefficients in Tables 3 and 4 to determine which of the independent variables has the strongest association with the dependent variable, depression.

Finally, tests for interaction effects were conducted to examine whether the job demand coefficients are moderated by the levels of job control or social support (Hypothesis 2b, 3b, and 4b). Each measure of job demand was multiplied by the moderating variables, autonomy, schedule flexibility, control over work hours and emotional coworker support separately, to create thirty-two interaction terms (e.g., *workload x autonomy*, *workload x control over work hours*, etc.) (Allison, 1999). After creating the interaction terms, a number of regression analyses which included the interaction terms, the main effect forms of the moderating variables, the job demand variables and control variables were conducted. The coefficients for the interaction terms were then examined to determine whether they were significant at alpha levels of 0.05, 0.01, and 0.001 (one-tailed test). Interaction terms that are found to be significant indicate that the relationship of the job demand variable and depression is moderated by one of the job control or social support variables.

Chapter 4 - Results

This chapter outlines the results of the statistical analyses conducted in this study. The first section describes the results from the t-tests of mean differences for women and men (Table 3). The second section describes the results from the ordinary least squares (OLS) multiple regression that estimates the main effects predicted by the JDCS model (Table 4). Lastly, the third section describes the results from the tests for interaction effects of the JDCS buffer hypotheses as well as for gender difference in effects.

Mean Difference Results

Physical demands and Health Risks.

The first question examined in this study is: Do men and women experience the same amount of physical demands and health risks in their jobs? Table 3 shows that women report significantly more frequent improper posture and lifting in their work (mean = 2.98) compared to men (mean = 2.65). Female veterinarians also report significantly more frequent exposure to chemicals, gases and solvents (mean = 2.50) and to radiation (mean = 2.56) than male veterinarians (mean = 2.23 and mean = 2.31, respectively). However, the reports on injury and illness for men and women shows no significant difference between the groups (men = 2.50, women = 2.54).

Dependent variable: Depression

The mean difference results presented in Table 3 show that female veterinarians report statistically significantly higher levels of depression as compared to male veterinarians. Women report a mean score of 1.71 while men report a mean score of 1.24 on the depression scale.

JDCS variables

A look at the mean differences shows there is no significant difference between men's and women's workload (men = 3.48, women = 3.63) while there is a significant difference between their work hours. The results shows that male veterinarians work, on average, 43 hours per week as compared to female veterinarians who work an average of 39 hours per week. Based on the results from Table 3, men and women do not differ significantly in their reports of dealing with client grief and experiencing unrealistic clients' expectations. Men report having significantly more autonomy than women (men = 4.16, women = 3.83) and control over work hours (men = 3.42, women = 2.89). There is, however, no significant difference between men's and women's work schedule flexibility (men= 2.95, women = 2.89). On the other hand, female veterinarians report having significantly higher emotional coworker support (mean = 3.71) than male veterinarians (mean = 3.50).

Control variables

The results show that men are more likely to be married or in a common-law relationship (84%) than women (74%), earn a higher income (Mean=5.13) than women (Mean=3.80) and have more years of experience at work as compared to women (21 years compared to 12 years). Male veterinarians are more likely to be working full-time (94%) and practicing in a large or mixed animal practice (42%) than female veterinarians (72% and 27%, respectively). However, women report a higher number of other veterinarians working with them at their immediate workplace as compared to men (women =2.02. men = 1.81) even though both genders appear to be working with approximately 2-4 others in their clinical practice.

Summary of mean difference results

Women report significantly higher levels of depression than men, which is consistent with the literature. In terms of job demands, men report longer work hours, whereas women report more physical demands and exposure to health risks than men. Men and women do not differ however in the emotional demands from their clients. Male veterinarians report having more autonomy and control over work while female veterinarians report more supportive coworkers. With regards to the control variables, male veterinarians report earning more income, having more years of experience and are more likely to be working full-time, and working for large or mixed animal practice. More of the men are married or in common-law relationships than women. Women, however, work with more veterinarians at their workplace as compared to men.

Table 3 Mean Differences for Men (N = 94) and Women (N = 249) Veterinarians

	Men	Women	t
	Mean (SD)	Mean (SD)	
Dependent Variable			
Depression	1.24 (1.42)	1.71 (1.49)	2.45**
Control variables			
Marital status	0.84 (0.37)	0.74 (0.46)	-2.58**
Income	5.13 (1.81)	3.80 (1.50)	-6.97***
Number of Vets	1.81 (0.64)	2.02 (0.72)	2.51**
Years of experience	20.57 (12.65)	12.02 (9.04)	-6.94***
Type of practice	0.42 (0.49)	0.27 (0.45)	-2.77**
Employment status	0.94 (0.29)	0.72 (0.45)	-3.67***
JDCS Variables			
Workload	3.48 (0.95)	3.63 (0.86)	1.44
Work hours	43.35 (12.80)	38.67 (13.07)	-4.24***
Client grief	2.94 (0.89)	3.09 (0.78)	1.54
Unrealistic clients	3.50 (0.85)	3.59 (0.71)	1.18
Autonomy	4.16 (0.73)	3.83 (0.78)	-3.47***
Schedule flexibility	3.05 (1.11)	3.11 (1.11)	-0.45
Control over workhours	3.42 (0.99)	2.89 (1.02)	-4.41***
Coworker support	3.50 (0.87)	3.71 (0.77)	2.22*
Physical Demands & Health Risk			
Improper posture& lift	2.65 (0.87)	2.98(0.89)	3.11**
Injury and illness	2.50 (0.68)	2.54 (0.69)	0.98
Exposure to chemicals	2.23 (0.86)	2.50 (0.90)	2.56**
Exposure to radiation	2.31 (0.99)	2.55 (0.94)	2.07*

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (two tailed-test)

Ordinary Least Squares (OLS) Multiple Regression Results

The results from the main effects regression equations, including both unstandardized (*b*) and standardized coefficients (β), the standard errors, the coefficient of determination (R^2) and change in R^2 are presented in Table 4. Equation 1 shows results that include only the control variables; equation 2 shows results including both the control variables and traditional JDCS model variables; and equation 3 shows results from all the control, traditional JDCS model, and the addition of the physical demands and health risks variables. These results are described in greater detail below.

Physical Demands and Health Risks Results

The second question addressed in this study is: Do physical demands and health risks affect mental health? Equation 3 includes the addition of the more occupation-specific job demands included in the JDCS model. The results show partial support for Hypothesis 4a which predicted that greater physical demands (improper lifting, improper posture) and health risks (risk of illness and injury, exposure to chemicals, gases and solvents, exposure to radiation) will be related to poorer mental health. It is a partial support because only two of the additional demands included in this hypothesis (that is, improper posture and risk of injury and illness) were found to be significantly associated with poorer mental health. The results indicate that physical demands are significantly and positively related to depression ($\beta= 0.12, p < 0.05$). Thus, experiencing improper posture and lifting at work is detrimental to veterinarians' mental health. Also, the health risk variable that includes risk of illness and risk of injury is significantly and positively related to depression ($\beta= 0.09, p < 0.05$). Risk of illness and injury also appear detrimental to veterinarians' mental health. However, the two health risk variables that reflect exposure to chemicals, gases and

solvents and exposure to radiation are not significantly related to depression. Comparing the two R^2 values in equations 2 and 3, the R^2 value for equation 3 increases from 0.32 to 0.34, registering a change of 0.02 when physical demands and health risks variables are included in the model. The R^2 value and the change in R^2 are both statistically significant ($p < 0.001$).

Job Demand-Control-Support Model Results

The results in Table 3, equation 3 demonstrate partial support for Hypothesis 1, which predicted that greater workload and work hours would be related to poor mental health. The results show that workload is significantly and positively related to depression ($\beta = 0.34, p < 0.001$) whereas work hours is not. As mentioned above, the partial support suggests that some of the variables in the hypothesis are not significantly related to poorer mental health and in this case, work hours was found to be unrelated to depression. With regards to emotional demands, dealing with clients' grief ($\beta = 0.20, p < 0.05$) and unrealistic clients' expectations ($\beta = 0.17, p < 0.05$) are both significantly and positively related to depression. This suggests that emotional demands from work are also detrimental to veterinarians' mental health.

Hypothesis 2a predicted that more control over work hours, autonomy and schedule flexibility would be related to better mental health. Schedule flexibility ($\beta = -0.17, p < 0.01$) and control over work hours ($\beta = -0.03, p < 0.01$) are significantly and negatively related to depression, while autonomy is not significantly related to depression. The results suggest that having a flexible schedule at work and control over one's work hours decreases veterinarians' depression, which shows partial support for Hypothesis 2a.

Lastly, Hypothesis 3a predicted that more emotional support from one's coworkers would be related to better mental health. The results in equation 3 show that emotional coworker support

is significantly and negatively related to veterinarians' depression ($\beta = -0.12, p < 0.05$). This suggests that more emotional support from coworkers results in less depression or better mental health.

Control Variables Results

The results presented in Table 3 equation 3 demonstrate the relationships between the control variables and depression. Gender and marital status are not significantly related to depression. Income is significantly related to depression ($\beta = -0.08, p < 0.05$), such that higher earnings are related to less depression. Only one of the work-related control variables, number of veterinarians working in the clinic, is significantly related to depression ($\beta = -0.17, p < 0.05$), such that veterinarians working in clinics with a larger number of veterinarians report lower levels of depression.

Summary of OLS multiple regression results

The final OLS regression equation analysis (equation 3) shows that the physical demands veterinarians encounter in their work, which consist of improper lifting and posture and risk of injury and illness, are both significantly and positively related to depression. In contrast, neither risk of exposure to harmful substances variables are related to veterinarians' mental health. Of the JDACS model variables, workload, dealing with clients' grief and unrealistic clients' expectations, schedule flexibility, control over work hours and emotional coworker support are significantly related to veterinarians' depression as hypothesized.

Buffer Interaction Effects Results

In total, thirty-two interaction tests between the job control and social support variables and all eight of the job demand variables were conducted. These interactions tests were carried out to determine if there is support for the buffer hypotheses set out above. Specifically, it was hypothesized that the job control variables would moderate the effects of job demands (Hypothesis 2b) and physical demands and health risks (Hypothesis 4b) on depression. It was also hypothesized that social support would moderate the effects of job demands (Hypothesis 3b) and physical demands and health risks (Hypothesis 4c) on depression. Equations 1, 3 and 5 (Appendix A) include all the variables in the study and the job control buffer interaction tests. Equations 2, 4 and 6 include all the variables but with only the significant job control buffer tests while the non-significant results were removed. Equation 7 includes all the variables and the social support buffer interaction tests.

Out of the thirty-two interaction tests, only three were statistically significant: *autonomy x improper posture and lifting* ($\beta = -0.4, p < 0.05$); *schedule flexibility x injury and illness* ($\beta = -0.58, p < 0.01$); and *control over work hours x exposure to gases, chemicals and solvents* ($\beta = -0.41, p < 0.01$). These results offer partial support for Hypothesis 4b that predicted job control will moderate the relationships between physical demands and health risks and mental health. That is, the relationships between improper posture and lifting and mental health are weaker when workers have more autonomy at work. Also, the relationship between injury and illness and depression is weaker when workers have more schedule flexibility. Similarly, the results suggest that the relationship between exposure to gases, chemicals and solvents and depression is weaker when workers have more control over work hours. Lastly, none of the interaction tests that tested whether social support was a significant moderator were statistically significant. The results, therefore,

showed no support for Hypothesis 4c which predicted that social support will moderate the relationship between job demands, physical demands and health risks and mental health.

Given that only three of the thirty-two interactions support the buffering hypothesis, it is concluded that this model is a main effect model. A number of studies that have examined the buffering effects of the JDCS model hypothesized by Karasek (1979) found similar results to those obtained from this analysis. They found little or no support for the buffering effects that hypothesized that job control and social support may moderate the relationship between job demands and psychological well-being. Thus, they have similarly concluded that the JDCS model is an additive model (Chiang et al, 2010; Willemse, de Jonge, Smith, Depla, and Pot, 2012, Hausser et al, 2010).

Gender Interactions Results

The third research question addressed in this study is: Do the effects of physical demands and health risks on mental health differ by gender? In total, eighteen interaction tests between gender and the four physical demands and health risk variables, the four job demand variables, as well as the job control, social support, and control variables were conducted. Equations 8, 9 and 10 in Appendix B include all the variables and the gender interactions with the control, job demands and social support respectively. Equations 11 and 12 show the gender specific main effects that are significantly related to depression.

There are only two statistically significant gender interactions. The results show that risk of injury and illness (*gender x risk of injury and illness*, $\beta = -0.49$, $p < 0.01$) and exposure to radiation (*gender x exposure to radiation*, $\beta = 0.37$, $p < 0.01$) have significant gender interactions. The main-effect model for depression was estimated for men and women separately to analyze the

gender-specific effects of these two significant interactions. The results indicate that risk of injury and illness has a significant positive effect on female veterinarians' depression ($\beta = 0.17, p < 0.01$) and no effect on male veterinarians' depression ($\beta = -0.09, p < 0.05$). In contrast, exposure to radiation has a significant positive effect on male veterinarians' depression ($\beta = 0.23, p < 0.05$) and no effect on female veterinarians' depression ($\beta = -0.05, p < 0.05$).

Given that only two of the eighteen gender interactions are significant, it is concluded that this model is a main effect model. Though the mean difference results in Table 3 showed significant differences in work experiences for male and female veterinarians, the gender interaction test results show there are few gender-specific effects and that most variables have the same effects on male and female veterinarians' mental health.

Table 4 Regression Results of the JDCS Model and Physical Demand and Health Risk Variables (N=378)

	Equation 1			Equation 2			Equation 3		
	b	SE	β	b	SE	β	b	SE	β
Control Variables									
Sex (Male=1)	-0.28	0.19	-0.08	-0.18	0.17	-0.05	-0.17	0.17	-0.05
Marital status (M=1)	-0.16	0.16	-0.05	-0.17	0.14	-0.06	-0.14	0.14	-0.05
Income	-0.09	0.05	-0.10*	-0.09	0.05	-0.10*	-0.08	0.05	-0.09*
Number of Vets	-0.11	0.11	-0.05	-0.17	0.10	-0.08*	-0.17	0.09	-0.08*
Years of experience	-0.01	0.01	-0.08	-0.00	0.01	-0.02	-0.00	0.01	-0.01
Type of practice	-0.17	0.16	-0.06	-0.07	0.14	-0.02	-0.18	0.15	-0.05
Employment status	0.44	0.19	0.13**	0.18	0.21	0.05	0.16	0.21	0.05
JDCS Variables									
Workload				0.39	0.09	0.24 ***	0.34	0.09	0.21 ***
Work hours				0.00	0.01	0.01	0.00	0.01	0.00
Client grief				0.26	0.08	0.15**	0.20	0.09	0.11*
Unrealistic client				0.21	0.09	0.11*	0.17	0.09	0.09*
Autonomy				-0.15	0.11	-0.08	-0.15	0.11	-0.08
Schedule flexibility				-0.17	0.07	-0.13**	-0.17	0.07	-0.12**
Control over work									
hours				-0.08	0.09	-0.06	-0.03	0.09	-0.02**
Coworker support				-0.26	0.09	-0.14**	-0.24	0.09	-0.12*
Physical Demands & Health Risks									
Improper posture& lift							0.19	0.09	0.12*
Injury and illness							0.21	0.12	0.09*
Exposure to chemicals							-0.10	0.09	-0.06
Exposure to radiation							0.05	0.08	0.04
Constant	2.23***			1.76*					
Change in R²				0.26***			0.03		
R²	0.06**			0.32***			0.02***		
							0.34***		

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (one-tail test)

Chapter 5 - Discussion and Conclusions

The main purpose of this thesis was to examine how veterinarians' work experiences are related to mental health and whether they may differ by gender. To achieve this, physical demands and health risks were also considered as additional job demands to Karasek's JDCA model. Three main research questions addressed in this study are: 1) Do men and women experience the same amount of physical demands and health risks in their jobs? 2) Do physical demands and health risks affect their mental health? and 3) Do the effects of physical demands and health risks on mental health differ by gender? This chapter discusses how the results of this study relate to these main research questions.

Do men and women experience the same amount of physical demands and health risks?

The results from this thesis reveal several important findings. Women experience more improper posture and lifting, and exposure to chemicals and radiation as compared to men. One possible explanation for this pattern of findings is related to the traditional sex segregation of occupations (Eng et al, 2011). A large number of women are often found to be working in female-dominated jobs, or pink-collar occupations, which are described as clean and safe while men are more often found to be working in blue or white-collar occupations which are typically male-dominated and described as dangerous, physically demanding and/or intellectually challenging (Hodson and Sullivan, 2012). The nature of pink-collar occupations often do not involve exposure to health risks and women in these occupations may not report having such experiences. However, an occupation that is female-dominated but physically demanding and dangerous may not be the general expectation of most women because it is in contrast to traditional female-dominated jobs. Hence, women may be reporting exposure to chemicals and improper posture and lifting more often than men because they are comparing their work experience to other female-dominated jobs

where dangerous and unhealthy work is not expected (Messing, 1998; Smith and Mustard, 2004). Men, on the other hand, may be reporting lower exposure to chemicals and improper posture and lifting because of the gendered expectations of male work roles. Men may be disregarding experiences of physical discomfort and health risks as a means of demonstrating their masculinity and difference from women in these jobs. That is, reporting experiences in “socially masculinised” physically risky activities, may undermine men’s status (Courtenay, 2000).

In contrast, men and women report similar amounts of risk of injury and illness. It may be possible that women are “performing professionalism” in some cases (Irvine and Vermilya, 2010) by downplaying some of the risky aspects of the job and identifying more with what they considered masculine attributes. They are therefore reporting similar amounts in order to “do masculinity” (Irvine and Vermilya, 2010), where reporting similar risks of injury and illness may show their ability to do dangerous work as well as men. As such, there still may be ways that veterinary medicine remains masculine even though it is female-dominated in numerical terms. Future research might explore the extent to which women are attaching different gendered meanings to certain health-related work experiences in occupations transitioning from male-dominated to female-dominated.

Do men and women differ in other ways?

In regards to other work demands, the results show that men work longer hours than women even though there are no significant gender differences in their workload, or dealing with client grief and unrealistic client expectations. Previous research shows that employed women’s workload is often reported as similar to men’s workload even though men work more hours than women (Milkie and Peltota, 1999; Robinson and Godbey 1997; Wallace and Young, 2010; Wheatley and Wu, 2014). It is possible that women feel a greater workload because they engage

in other activities or responsibilities, such as more housework, childcare, and eldercare, which often leads to women working fewer hours in paid employment (Becker and Moen 1999; Milkie and Peltota, 1999; Milkie, Mattingly, Nomaguchi, Bianchi and Robinson, 2004; Sayer, Bianchi and Robinson, 2004). Thus, normative gender role expectations, such as family roles, may lead to significant differences in paid work hours for men and women where men are expected to devote more time to their work role as breadwinners and women are expected to devote more time to their family roles as mothers and caregivers. Future research might explore whether family demands and responsibilities are also relevant in understanding the mental health of male and female veterinarians.

With regards to results for the emotional work demands, previous research has examined the impact of dealing with clients' grief and unrealistic clients expectations on veterinarians' stress (Epp and Waldner, 2012; Reijula, 2003; Shirangi, Fritschi, and Holman, 2008). Little is known however whether there is any gender difference in how veterinarians deal with client grief and unrealistic client expectations. As well, others have suggested that women may enter veterinary medicine because it is viewed as a caring profession (Irvine and Vermilya, 2010). The results from this study, however, show that men and women report experiencing the same frequencies of client grief and unrealistic client expectations. This finding could be a result of the fact that both men and women are socialized for the emotional requirements of veterinary medicine (Butler and Koll, 2002; Irvine and Vermilya, 2010). Workers entering into this profession, that involves regular encounters with humans or animals, are often trained to provide support for the close relationships between humans and animals and may, therefore, report similar experiences at work. Alternatively, as Irvine and Verymila (2010) report, women may downplay the emotional aspects of veterinary practice and emphasize the scientific aspects in attempting to present a professional image

especially in front of their male colleagues. In addition, it is possible that because there are no significant gender differences because the measures of emotional demands reflect the frequencies of such demands. Male and female veterinarians working in similar work settings (i.e., veterinary clinics) might encounter clients and patients with similar expectations and therefore reveal similar frequency or amounts of dealing with emotional demands at work. However, similarity in men and women's reports of emotional demands becomes a subject for further research and discussion. Future research might explore the extent to which women and men emphasize or downplay the emotional demands of their work. Future research might also explore gender differences in different aspects of emotion work, for example what types of encounters women and men find emotionally demanding as well as which ones they find more challenging in terms of managing their own emotions as caring professionals.

In terms of work resources, men report having more autonomy and control over work hours while women report relatively higher coworker support. These results support previous literature which reveals that male professionals report relatively high levels of job control and autonomy, with women professionals reporting lesser job control and autonomy (Nagami, Tsutsumi, Tsuchiya, and Morimoto, 2010; Roxburgh, 1999; Wheatley, 2017). The possible explanation for this pattern of findings is the continued gendered segregation in some professions (Wheatley, 2017), where men are more likely to be in positions of authority that have with them greater control and autonomy while women are often ranked lower in the hierarchy concerning pay, promotion, and mobility even with the same education and in the same workplace (Bloksgaard, 2011). This may prevent women from having more access to control resources and instead they seek or have more access to support resources. As well, the results show that female veterinarians tend to work in settings that employ a larger number of veterinarians, which may also be related to having more

support available to them. Having more access to social resources such as coworker support often serves as a desirable resource that creates positive work experiences and that may lead workers to a feeling of belonging (Limpanitgul, Boonchoo and Photiyarach, 2014). Future studies might examine whether men and women in feminized occupations have different types of interactions with both coworkers and clients based on their access to either control or support resources.

Do physical demands and health risks affect their mental health?

The results from this study show that physical demands and health risks are related to poorer mental health for veterinarians. This finding supports the main hypothesis of the JDCS model which argues that job demands impact on health outcomes. These findings also support earlier studies that suggest that additional work demands, besides work hours and workload, can be important predictors (Verhoeven, Kraaij, Joekes, and Maes, 2003; Verhoeven, Maes, Kraaij and Joekes, 2003). In this study, improper posture and lifting and risk of illness and injury were positively related to depression. While previous literature had focused on the impact of these job conditions on physical health (e.g., de Jonge et al, 2010), it is interesting to find that they affect mental health as well. While veterinarians hope to treat their animal patients, they are also at risk of being injured or taking ill from doing their work. This is a risk not often expected or associated with professional work or female-dominated work. Veterinarians may feel job strain as the demands associated with their work roles, and their health and safety concerns may lead to feelings of worry, uneasiness, and nervousness. Consequently, workers who feel more anxious about their work might report feeling more depressed (Sanne, Mykletun, Dahl, Moen and Tell, 2005; Wachs and Helge 2001). These findings suggest further research is needed on additional health and safety related work conditions to JDCS model and their relationship with mental health. Future research

might also examine whether physical demands and health risks are relevant in understanding mental health among other helping professionals. As well, future research might explore the extent to which workers expect to encounter such demands in their work and whether their training prepares them for such working conditions.

A particularly interesting finding of this study is the moderating effects of job control for the physical demand and health risk variables. Three of the twelve interactions tests for these variables indicate that autonomy, schedule flexibility and control over work hours moderate the relationships between improper posture and lifting, injury and illness, exposure to chemicals and gases and mental health respectively. These findings confirm previous literature which suggests that having control over work demands may improve one's mental health by reducing the harmful effects of those demands (Deci, Ryan, Gagné, Leone, Usunov, and Kornazheva, 2001; Karasek, 1979; Nordenmark, Vinberg, and Strandh, 2012; Willemse et al, 2012). Veterinarians are more likely to experience better mental health even when they exposed to high work physical demands and health risks if they have more control over their work and work hours. Having job control provides workers with a broad range of autonomous management of their work activities where they can put their personal skills to use at the same time developing a sense of mastery (Deacon and Brough, 2016; Karasek, 1979). Thus, the feeling of "being in charge" even when one has unhealthy or unsafe work demands leads to lower strain and consequently, lower levels of depression. In contrast, veterinarians who have excessive work demands together with lack of control over the speed of activities and discretion in performing their work have high levels of strain (Deacon and Brough, 2016; Shiringi et al, 2013; Irvine and Vermilya, 2010).

There is, however, no support for the buffering effect of social support as proposed in the JDACS model, which is also reported in other studies (Pelfrene, Vlerick, Kittel, Mak, Kornitzer, and Backer, 2002; Pomaki and Anagnostopoulou, 2003). This could be because there are other sources or types of support which are more relevant in moderating the job demands on veterinarian's mental health. For example, instrumental supervisor support or emotional spousal support might be considered in future research.

What other demands and work resources are related to mental health?

The results show that work demands such as workload, dealing with clients' grief and clients' expectations are significantly related to poorer mental health even though work hours is not. Previous literature also shows that heavy, excessive workloads may cause workers to experience more psychological symptoms such as depression or strain, thus having an adverse effect on their mental health (Canivet, Choi, Karasek, Moghaddassi, Staland-Nyman, and Ostergren, 2012; Deacon and Brough, 2016; Demerouti et al, 2014). In contrast, work hours is not significantly related to poorer mental health. It is possible that work hours may not be one of the main job stressors in professional work. Professionals' reports of working long hours is quite common (Rupert and Morgan, David, 2005; Landrigan et al, 2004) and this is because in most professional occupations, working long hours often depicts one's extra effort to achieve career success (Joudrey and Wallace, 2009). Long work hours, therefore, may not necessarily be experienced as a work demand unless it results in an excessive, overwhelming workload which does negatively impact on their mental health (Joudrey and Wallace, 2009).

While most studies operationalise job demands as work hours and workload, this study also included emotional demands which are relevant to professional workers who work with

people and help them cope with their problems (Maslach, 1978). The findings reported here are consistent with others that found that workers who have to deal with clients' grief and expectations are more likely to experience poorer mental health (Epp and Waldner, 2012; Reijula, 2003; Shirangi, Fritschi, and Holman, 2008; Irvine and Vermilya, 2010). As indicated earlier, veterinarians are often involved not only caring for animals but also dealing with clients who are the animals' owners (Hatch, Winefield, and Lievaart, 2011; Reijula, 2003; Shirangi, Fritschi, and Holman, 2013). Both of these sources of emotional demands reflect the need for emotional intelligence at work. This is because veterinarians must also ensure that the human clients leave feeling satisfied with the care and health of their pet and in situations where the pet cannot be helped, they must act professionally as they undertake euthanasia and also help clients get over their grief of loss (Ogilvie, 2016). In addition, situations where clients expect veterinarians to know everything about their pet's needs and unexpected health outcomes can be overwhelming and burdening (Halliwell and Hoskin, 2005). Research has shown that dealing with the distress of their clients leads veterinarians to frequent visits to psychological health consultants in attempting to cope with client-related stress issues (Epp and Waldner, 2012; Reijula, 2003; Shirangi, Fritschi, and Holman, 2008). The findings of this thesis support other studies that have examined various emotional demands at work and have found that they are related to work stress and or depression (Karimi, Leggat, Donohue, Farrell, and Couper, 2014; Siu, Cooper and Philips, 2014; Yoon and Kim, 2013). As well, the findings from this study provide evidence that emotional demands are important mental health predictors. Not only are emotional demands prevalent among veterinarians, they are also prevalent in other helping professions where much of the work involves interaction with people and providing support for their pressing needs. The results of this study,

therefore, suggest the need for further research in other helping professions examine whether emotional demands impact on workers' mental health.

Another objective of this thesis was to examine whether work resources moderate the relationship between work demands and mental health as proposed in Karasek et al's (1982) JDC (S) model. There was however little support for this aspect of the model. The relationships between the traditional work demand variables (excluding physical demands and health risks) and mental health were not moderated by the job control or social support variables. Previous research on these relationships shows partial support for the buffer hypothesis (Karasek, Triantis, and Chaudry, 1982; Sacco et al, 2014; Deacon and Brough, 2016). However, the results from this study do not mean that the work resources are not important to understanding work-related mental health. Rather, the control and support resources were found to contribute directly in improving veterinarians' mental health rather than as moderating variables.

Do the effects of physical demands and health risks on mental health differ by gender?

In this study, two of the four health risks variables, risk of injury and illness and exposure to radiation, significantly differed by gender in their relation to mental health. Risk of injury and illness is positively related to female veterinarians' depression and unrelated to men's, while exposure to radiation is positively related to male veterinarians' depression and is unrelated to women's. Even though there was no significant gender difference in the frequencies of risk of injury and illness between men and women, its impact on depression is significant for women. As mentioned earlier, it is possible that women in this occupation that has transitioned from male-dominated to female-dominated are "performing professionalism" (Irvine and Vermilya, 2010) by identifying more with what they considered masculine attributes. In doing so, they may report

similar amounts of injury and illness, but its impact on their health is reflected in their significantly higher level of depression.

Alternatively, a possible explanation is related to the fact that female veterinarians report significantly lower years of experience as compared to male veterinarians. Having more years of work experience reduces work stress (Lucas, Atwood and Hageman, 1993; Humpel and Caputi, 2001) and as such male veterinarians may have encountered more incidences of illnesses and injuries but may have developed more effective coping strategies over time (Humpel and Caputi, 2001). This may not be the case for female veterinarians who have been working for fewer years. They may have little or no experience in dealing with these types of stressful work experiences and therefore may feel depressed when they encounter frequent risks of injury.

On the other hand, male veterinarians' exposure to radiation is significantly related to depression. Even though men reported relatively lower exposure to radiation as compared to women, its impact on their mental health is significantly higher. It is possible that gendered expectations of male work roles may have led to reporting less exposure to radiation as well as other health risks as suggested earlier (Courtenay, 2000). Or, it may be that such exposure may become more of a concern over time. As indicated above, men have typically spent a longer time practicing veterinary medicine and as a result they may have had longer exposure to this health risk which becomes more stressful for them over time. This result suggests that researchers attempting to better understand the gender differences in work demands and their impact on mental health may consider men's and women's work expectations in occupations transitioning from male-dominated to female-dominated and how that impacts on their mental health.

While this study has several important implications for understanding the broader context of workplace demands and mental health, it has a number of limitations. First, this study was based

on cross-sectional data which may be prone to method bias to some extent. A longitudinal study may help obtain important data in understanding the impact of work demands on mental health as they may change over time or the life course. Conducting longitudinal analyses could also help establish the causal relationship between mental health and job demands, job control, social support, physical demands and health risks. For example, veterinarians who are highly depressed may cause them to perceive their work experiences, such as job demands and health risks, more negatively. As well, the design of this study prevents examination of the long-term effects of specific veterinarians' health risks such as exposure to chemicals and radiation. It is, therefore, impossible to determine whether these health risks may accumulate over time and lead to higher work strain and consequently poorer mental health.

Another limitation of this study is that the data are based on subjective self-reports from the perspective of individual respondents. The data, therefore, may have distorted results from respondents and raises questions about the reliability of the measures used in the study. Also, one of the control variables and all the physical demand and health risks variables were single indicator measures. Including additional health risk measures such as exposure to a specific chemical or gas or type of radiation might provide us with a wider range of content of these variables. Furthermore, including more details, such as the amount of time spent working with chemicals, gases, radiation, improper posture might offer us a better insight into the relative importance of each work experience on mental health. Future research may consider using more objective measures that might capture a wider range of content of the variables used in this study.

Lastly, this study is limited to a single high status, professionals, namely veterinarians. It is also limited to veterinarians in a particular work setting, which includes small, large and mixed animal clinics. This is important to consider as it has been documented that mental health status

might be linked to veterinarians' type of practice (Gardner and Hini, 2006). Some of the findings in this study may, therefore, be limited to this particular occupation and distinct from veterinarians in other settings, such as government or industry jobs and veterinarians teaching in veterinary training schools. Again, this study does not include specific positions in the work setting such as owners of the clinic in contrast to employees. Because type of practice might be linked to mental health status, it is important to also examine whether specific positions such as a clinical owner and employee may differ in their work experiences and how that may impact on their mental health status. As well, there may be gender differences across these positions where men are more likely to be owners and women are more likely to be employees, which may be linked to men's greater sense of autonomy and control compared to women's. These limitations raise concern over whether the findings are generalizable to veterinarians in other work settings and workers in other occupations. Hence, including specific positions in veterinary clinics and exploring any differences may offer us more insight into how that may impact on their work experiences and coping resources.

Despite these limitations, the results of this thesis offer several significant contributions to the literature. Women as compared to men are exposed to more physical demands and health risks in this occupation. With the increasing number of women entering this profession, these results offer insights into some of the work experiences of women in a traditionally male-dominated and masculine occupation. It also challenges normative gender role expectations that assume professional women work in less physical and dangerous work environments. The results may offer important health hazard information for other female-dominated occupations that face similar health risks as they may inform their health and safety precautions and implementations.

In addition, the findings from this study offer veterinarians in other work settings more information on health of workers in clinical practice. Veterinarians who work in training schools may gain insight into the work experiences of the veterinarians in the field which can be helpful in providing veterinary students with the necessary skills and practices needed to protect and improve their health at work, specifically their mental well-being. Also, veterinarians working in the government sector may be informed by this study to help implement policies that offer relevant coping strategies and well-being measures that will not only protect the health of the veterinarian but also ensure they work in a safe and conducive environment in all work settings.

Furthermore, the results show that regular physical demands and health risks lead to poorer mental health. This is an interesting and important finding revealing the impact of work experiences on mental health that are often considered only relevant to physical health. These research findings, therefore, signal the need for further exploration into additional physical demands and health risks and how they might impact on mental health. Also, this study found that specific health risks variables impact on men and women's mental health differently. This highlights the need for further examination of the long-term effects of physical demands and health risks and how they may differ for men and women's mental health.

Lastly, this study lays bare the true nature of work in veterinary medicine which is a contradictory to our notion of the professional work. The veterinary profession, like most professional occupations, is a profession with specific education and training requirements, accredited institutional provision of such training, and professional licensure monitored and reviewed a regulatory professional body professional (Evetts, 2002). Though these requirements meet some of the criteria for professional work, the day-to-day experiences and gender composition of veterinary medicine appear to contradict expectations of it being clean and safe,

which are typically ascribed to male-dominated professional work. Though veterinary work has existed for a long time, the specific unprofessional aspects of this work may have been overlooked because it is considered a professional occupation. The results of this study and others suggest that veterinary medicine is physically and emotionally demanding, dangerous, dirty and potentially physical and mentally unhealthy and risky. The results of this study suggest a need for further exploration into other professional occupations that may also have unprofessional and unhealthy work experiences that may be potentially damaging to the mental health of other professional workers.

References

- Angst, J., Gamma, A., Gastpar, M., Lépine, J. P., Mendlewicz, J., & Tylee, A. (2002). Gender differences in depression. *European Archives of Psychiatry and Clinical Neuroscience*, 252(5), 201-209.
- Allison, P. D. (1999). *Multiple regression: A primer*. Pine Forge Press.
- Aronsson, G., Gustafsson, K., & Dallner, M. (2002). Work environment and health in different types of temporary jobs. *European Journal of Work and Organizational Psychology*, 11(2), 151-175.
- Bakker, A. B., Demerouti, E., & Sanz-Vergel, A. I. (2014). Burnout and work engagement: The JD-R approach. *Annual Review of Organisational Psychology, Organisational Behaviour* (1), 389-411.
- Bartram, D. J., Yadegarfar, G., & Baldwin, D. S. (2009). A cross-sectional study of mental health and well-being and their associations in the UK veterinary profession. *Social Psychiatry and Psychiatric epidemiology*, 44(12), 1075.
- Bartram, D. J., & Baldwin, D. S. (2010). Veterinary surgeons and suicide: a structured review of possible influences on increased risk. *Veterinary Record*, 166(13), 388-397.
- Bartram, D. J., Yadegarfar, G., & Baldwin, D. S. (2009). Psychosocial working conditions and work-related stressors among UK veterinary surgeons. *Occupational Medicine*, 59(5), 334-341.
- Becker, P. E., & Moen, P. (1999). Scaling back: Dual-earner couples' work-family strategies. *Journal of Marriage and the Family*, (4)995-1007.

Bhui, K. S., Dinos, S., Stansfeld, S. A., & White, P. D. (2012). A synthesis of the evidence for managing stress at work: a review of the reviews reporting on anxiety, depression, and absenteeism. *Journal of Environmental and Public Health*, (2012) 1-21.

Bloksgaard, L. (2011). Masculinities, femininities and work-the horizontal gender segregation in the Danish labour market. *Nordic Journal of Working Life Studies*, 1(2), 5-21.

Bryan and Bell (2016). *Social Research Methods* (4th Canadian ed).Oxford University Press.

Butler, C., Williams, S., & Koll, S. (2002). Perceptions of fourth-year veterinary students regarding emotional support of clients in veterinary practice in the veterinary college curriculum. *Journal of the American Veterinary Medical Association*, 221(3), 360-363.

Canivet, C., Choi, B., Karasek, R., Moghaddassi, M., Staland-Nyman, C., & Östergren, P. O. (2013). Can high psychological job demands, low decision latitude, and high job strain predict disability pensions? A 12-year follow-up of middle-aged Swedish workers. *International Archives of Occupational and Environmental health*, 86(3), 307-319.

Caplan, R. D., Cobb, S., & French, J. R. (1975). Relationships of cessation of smoking with job stress, personality, and social support. *Journal of Applied Psychology*, 60(2), 211.

Cattell, K., Bowen, P., & Edwards, P. (2016). Stress among South African construction professionals: a job demand-control-support survey. *Construction Management and Economics*, 34(10), 700-723.

Chen, W. Q., Siu, O. L., Lu, J. F., Cooper, C. L., & Phillips, D. R. (2009). Work stress and depression: the direct and moderating effects of informal social support and coping. *Stress and Health*, 25(5), 431-443.

- Chiang, F. F., Birtch, T. A., & Kwan, H. K. (2010). The moderating roles of job control and work-life balance practices on employee stress in the hotel and catering industry. *International Journal of Hospitality Management*, 29(1), 25-32.
- Cioni, M., & Savioli, M. (2015). Safety at the workplace: accidents and illnesses. *Work, Employment & Society*, 30(5), 858-875.
- Cobb, S. (1976). Social support as a moderator of life stress. *Psychosomatic medicine*, 38(5), 300-314.
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, 98(2), 310.
- Collins, S. (2008). Statutory social workers: Stress, job satisfaction, coping, social support and individual differences. *British Journal of Social Work*, 38(6), 1173-1193.
- Colwell, S., & Carter, E. (2012). *Introduction to Statistics for Social Sciences*. New York: McGraw-Hill Higher Education.
- Courtenay, W. H. (2000). Constructions of masculinity and their influence on men's well-being: a theory of gender and health. *Social Science & Medicine*, 50(10), 1385-1401.
- Courtenay, W. H. (2000). Engendering health: A social constructionist examination of men's health beliefs and behaviors. *Psychology of Men & Masculinity*, 1(1), 4.
- da Silva, A. T. C., Lopes, C. D. S., Susser, E., & Menezes, P. R. (2016). Work-Related Depression in Primary Care Teams in Brazil. *American Journal of Public Health*, 106(11), 1990-1997.

Dawson, K. M., O'Brien, K. E., & Beehr, T. A. (2015). The role of hindrance stressors in the job demand–control–support model of occupational stress: A proposed theory revision. *Journal of Organizational Behavior*, (2019) 1- 19.

Deacon, R. E., & Brough, P. (2016). Veterinary nurses' psychological well-being: The impact of patient suffering and death. *Australian Journal of Psychology*. 1-9. doi: 10.1111/ajpy.12119.

Deci, E. L., Ryan, R. M., Gagné, M., Leone, D. R., Usunov, J., & Kornazheva, B. P. (2001). Need satisfaction, motivation, and well-being in the work organizations of a former eastern bloc country: A cross-cultural study of self-determination. *Personality and Social Psychology Bulletin*, 27(8), 930-942.

de Jonge, J., van Vegchel, N., Shimazu, A., Schaufeli, W., & Dormann, C. (2010). A longitudinal test of the demand–control model using specific job demands and specific job control. *International Journal of Behavioral Medicine*, 17(2), 125-133.

Demerouti, E., & Bakker, A. B. (2014). Job crafting. Peeters, M.C.W., de Jonge, J., Taris, T.W. (Eds.), *An Introduction to Contemporary Work Psychology*. Wiley-Blackwell, Chichester, pp. 414–433.

Demerouti, E., Derks, D., Lieke, L., & Bakker, A. B. (2014). New ways of working: Impact on working conditions, work–family balance, and well-being. In *The impact of ICT on quality of working life* (pp. 123-141). Springer Netherlands.

Devereux, J. J., Buckle, P. W., & Vlachonikolis, I. G. (1999). Interactions between physical and psychosocial risk factors at work increase the risk of back disorders: an epidemiological approach. *Occupational and Environmental Medicine*, 56(5), 343-353.

- Drentea, P. (1998). Consequences of women's formal and informal job search methods for employment in female-dominated jobs. *Gender & Society, 12*(3), 321-338.
- Dozeman, E., van Schaik, D. J., van Marwijk, H. W., Stek, M. L., van der Horst, H. E., & Beekman, A. T. (2011). The center for epidemiological studies depression scale (CES- D) is an adequate screening instrument for depressive and anxiety disorders in a very old population living in residential homes. *International Journal of Geriatric Psychiatry, 26*(3), 239-246.
- Eng, A., Mannetje, A. T., McLean, D., Ellison-Loschmann, L., Cheng, S., & Pearce, N. (2011). Gender differences in occupational exposure patterns. *Occupational and Environmental Medicine, 68*(12), 1-24.
- Epp, T., & Waldner, C. (2012). Occupational health hazards in veterinary medicine: physical, psychological, and chemical hazards. *Canadian Veterinary Journal, 53*(2), 151.
- Evans-Lacko, S., & Knapp, M. (2014). Importance of social and cultural factors for attitudes, disclosure and time off work for depression: findings from a seven country European study on depression in the workplace. *PLoS One, 9*(3), e91053.
- Evetts, J. (2002). New directions in state and international professional occupations: discretionary decision-making and acquired regulation. *Work, employment and society, 16*(2), 341-353.
- Fila, M. J., Paik, L. S., Griffeth, R. W., & Allen, D. (2014). Disaggregating job satisfaction: Effects of perceived demands, control, and support. *Journal of Business and Psychology, 29*(4), 639-649.
- Foster, S. M., & Maples, E. H. (2014). Occupational stress in veterinary support staff. *Journal of Veterinary Medical Education, 41*(1), 102-110.
- Fox, J. (1991). Regression diagnostics: quantitative applications in the social sciences. *Sage University Paper, 7*, 1-92.

- Fransson, E. I., Nyberg, S. T., Heikkilä, K., Alfredsson, L., Bacquer, D. D., Batty, G. D., & Kittel, F. (2012). Comparison of alternative versions of the job demand-control scales in 17 European cohort studies: the IPD-Work consortium. *BMC Public Health, 12*(1), 62.
- Fritschi, L., Shirangi, A., Robertson, I. D., & Day, L. M. (2008). Trends in exposure of veterinarians to physical and chemical hazards and use of protection practices. *International Archives of Occupational and Environmental Health, 81*(3), 371-378.
- Frone, M. R., Russell, M., & Cooper, M. L. (1997). Relation of work–family conflict to health outcomes: A four- year longitudinal study of employed parents. *Journal of Occupational and Organizational Psychology, 70*(4), 325-335.
- Ganster, D. C., & Rosen, C. C. (2013). Work stress and employee health A multidisciplinary review. *Journal of Management, 39*, 1085–1122.
- Ganster, D. C., Fusilier, M. R., & Mayes, B. T. (1986). Role of social support in the experience of stress at work. *Journal of Applied Psychology, 71*(1), 102.
- Gardner, D., & Fletcher, R. (2009). Demands, appraisal, coping and outcomes: Positive and negative aspects of occupational stress in veterinarians. *International Journal of Organizational Analysis, 17*(4), 268-284.
- Goetzel, R. Z., & Ozminkowski, R. J. (2008). The health and cost benefits of work site health-promotion programs. *Annual . Review of Public Health, 29*, 303-323.
- Halliwell, R. E. W., & Hoskin, B. D. (2005). Reducing the suicide rate among veterinary surgeons: how the profession can help. *Veterinary Record, 157*(14), 397.

- Hatch, P. H., Winefield, H. R., Christie, B. A., & Lievaart, J. J. (2011). Workplace stress, mental health, and burnout of veterinarians in Australia. *Australian Veterinary Journal*, 89(11), 460-468.
- Hansez, I., Schins, F., & Rollin, F. (2008). Occupational stress, work-home interference and burnout among Belgian veterinary practitioners. *Irish Veterinary Journal*, 61(4), 233-241.
- Häusser, J. A., Mojzisch, A., Niesel, M., & Schulz-Hardt, S. (2010). Ten years on: A review of recent research on the Job Demand–Control (-Support) model and psychological well-being. *Work & Stress*, 24(1), 1-35.
- Hill, D. J., Langley, R. L., & Morrow, W. M. (1998). Occupational injuries and illnesses reported by zoo veterinarians in the United States. *Journal of Zoo and Wildlife Medicine*, 29 (4) 371-385.
- Hodson, R., & Sullivan, T. A. (2012). *The Social Organization of Work*. Cengage Learning.
- Holtzman, M., & Glass, J. (1999). Explaining changes in mothers' job satisfaction following childbirth. *Work and Occupations*, 26(3), 365-404.
- Hu, Q., Schaufeli, W. B., & Taris, T. W. (2011). The Job Demands–Resources model: An analysis of additive and joint effects of demands and resources. *Journal of Vocational Behavior*, 79(1), 181-190.
- Humpel, N., & Caputi, P. (2001). Exploring the relationship between work stress, years of experience and emotional competency using a sample of Australian mental health nurses. *Journal of Psychiatric and Mental Health Nursing*, 8(5), 399-403.
- Irvine, L., & Vermilya, J. R. (2010). Gender work in a feminized profession: The case of veterinary medicine. *Gender & Society*, 24(1), 56-82.

Jeyaretnam, J., & Jones, H. (2000). Physical, chemical and biological hazards in veterinary practice. *Australian Veterinary Journal*, 78(11), 751-758.

Joudrey, A. D., & Wallace, J. E. (2009). Leisure as a coping resource: A test of the job demand-control-support model. *Human Relations*, 62(2), 195-217.

Karasek Jr, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, 24, 285-308.

Karasek, R. A., Triantis, K. P., & Chaudhry, S. S. (1982). Coworker and supervisor support as moderators of associations between task characteristics and mental strain. *Journal of Organizational Behavior*, 3(2), 181-200.

Karimi, L., Leggat, S. G., Donohue, L., Farrell, G., & Couper, G. E. (2014). Emotional rescue: the role of emotional intelligence and emotional labour on well-being and job-stress among community nurses. *Journal of Advanced Nursing*, 70(1), 176-186.

Kim, G., DeCoster, J., Huang, C. H., & Chiriboga, D. A. (2011). Race/ethnicity and the factor structure of the Center for Epidemiologic Studies Depression Scale: a meta-analysis. *Cultural Diversity and Ethnic Minority Psychology*, 17(4) 381–396.

Kmec, J. A. (2005). Setting occupational sex segregation in motion: Demand-side explanations of sex traditional employment. *Work and Occupations*, 32(3), 322-354.

Kossek, E. E., Pichler, S., Bodner, T., & Hammer, L. B. (2011). Workplace social support and work-family conflict: A meta-analysis clarifying the influence of general and work-family-specific supervisor and organizational support. *Personnel Psychology*, 64(2), 289-313.

Knudsen, H. K., Johnson, J. A., & Roman, P. M. (2003). Retaining counseling staff at substance abuse treatment centers: Effects of management practices. *Journal of Substance Abuse Treatment, 24*(2), 129-135.

Landrigan, C. P., Rothschild, J. M., Cronin, J. W., Kaushal, R., Burdick, E., Katz, J. T., Craig M. L., Stone P.H, Steven W. Lockley S.W., Bates D.W., & Czeisler, C. A. (2004). Effect of reducing interns' work hours on serious medical errors in intensive care units. *New England Journal of Medicine, 351*(18), 1838-1848.

Lincoln, A. E. (2010). The shifting supply of men and women to occupations: feminization in veterinary education. *Social Forces, 88*(5), 1969-1998.

Limpanitgul, T., Boonchoo, P., & Photiyarach, S. (2014). Coworker support and organisational commitment: A comparative study of Thai employees working in Thai and American airlines. *Journal of Hospitality and Tourism Management, 21*, 100-107.

Lheureux, F., Truchot, D., & Borteyrou, X. (2016). Suicidal tendency, physical health problems and addictive behaviours among general practitioners: their relationship with burnout. *Work & Stress, 30*(2), 173-192.

Lofstedt, J. (2003). Gender and veterinary medicine. *The Canadian Veterinary Journal, 44*(7), 533-535.

Lucas, M., Atwood, J., & Hagaman, R. (1993). Replication and validation of anticipated turnover model for urban registered nurses. *Nursing Research, 42*, 29-35.

- Lucas, V., Spence Laschinger, H. K., & Wong, C. A. (2008). The impact of emotional intelligent leadership on staff nurse empowerment: the moderating effect of span of control. *Journal of Nursing Management, 16*(8), 964-973.
- Magee, C. A., Stefanic, N., Caputi, P., & Iverson, D. C. (2012). The association between job demands/control and health in employed parents: the mediating role of work-to-family interference and enhancement. *Journal of Occupational Health Psychology, 17*(2), 196-205.
- Mann, S., & Cowburn, J. (2005). Emotional labour and stress within mental health nursing. *Journal of Psychiatric and Mental Health Nursing, 12*(2), 154-162.
- Marks, S.R. and MacDermid, S.M. (1996). Multiple roles and the self: a theory of role balance. *Journal of Marriage and the Family, 58*, 417/432.
- Maslach, C. (1978). The client role in staff burn- out. *Journal of Social Issues, 34*(4), 111-124.
- Mastenbroek, N. J. J. M., Jaarsma, A. D. C., Demerouti, E., Muijtjens, A. M. M., Scherpbier, A. J. J. A., & Van Beukelen, P. (2014). Burnout and engagement, and its predictors in young veterinary professionals: the influence of gender. *Veterinary Records, 174*(6), 144.
- Meier, L. L., Semmer, N. K., Elfering, A., & Jacobshagen, N. (2008). The double meaning of control: three-way interactions between internal resources, job control, and stressors at work. *Journal of Occupational Health Psychology, 13*(3), 244.
- Mehmetoglu, M., & Jakobsen, T. G. (2016). *Applied Statistics Using Stata: A Guide for the Social Sciences*. London. SAGE Publications..
- Messing, K. (1998). *One-eyed science: Occupational Health and Women Workers*. Philadelphia. Temple University Press.

- Milkie, M. A., & Peltola, P. (1999). Playing all the roles: Gender and the work-family balancing act. *Journal of Marriage and the Family*, 61,476-490.
- Milkie, M. A., Mattingly, M. J., Nomaguchi, K. M., Bianchi, S. M., & Robinson, J. P. (2004). The time squeeze: Parental statuses and feelings about time with children. *Journal of Marriage and Family*, 66(3), 739-761.
- Nagami, M., Tsutsumi, A., Tsuchiya, M., & Morimoto, K. (2010). Job control and coworker support improve employee job performance. *Industrial Health*, 48(6), 845-851.
- Nordenmark, M., Vinberg, S., & Strandh, M. (2012). Job control and demands, work-life balance and wellbeing among self employed men and women in Europe. *Society, Health & Vulnerability*, 3(1) 1-18.
- Ng, T. W., & Sorensen, K. L. (2008). Toward a further understanding of the relationships between perceptions of support and work attitudes: A meta-analysis. *Group & Organization Management*. 33, 243–268.
- Nunnally J. C. (1978). *Psychometric theory* (2nd edition). New York. McGraw Hill.
- Ogilvie, G. K. (2016). A clinician's viewpoints on wellness and the human-animal bond in practice. *Advances in Small Animal Medicine and Surgery*, 29(9), 1-3.
- Pelfrene, E., Vlerick, P., Kittel, F., Mak, R. P., Kornitzer, M., & Backer, G. D. (2002). Psychosocial work environment and psychological well-being: assessment of the buffering effects in the job demand–control (–support) model in belstress *Stress and Health*, 18(1), 43-56.
- Phillips, M., Jeyaretnam, J., & Jones, H. (2000). Disease and injury among veterinarians. *Australian Veterinary Journal*, 78(9), 625-629.

Pomaki, G., & Anagnostopoulou, T. (2003). A test and extension of the demand/control/social support model: Prediction of wellness/health outcomes in Greek teachers. *Psychology and Health, 18*(4), 537-550.

Platt, B., Hawton, K., Simkin, S., & Mellanby, R. J. (2012). Suicidal behaviour and psychosocial problems in veterinary surgeons: a systematic review. *Social Psychiatry and Psychiatric Epidemiology, 47*(2), 223-240.

Pronost, A. M., Le Gouge, A., Leboul, D., Gardembas-Pain, M., Berthou, C., Giraudeau, B., Fouquereau E., & Colombat, P. (2012). Relationships between the characteristics of oncohematology services providing palliative care and the sociodemographic characteristics of caregivers using health indicators: social support, perceived stress, coping strategies, and quality of work life. *Supportive Care in Cancer, 20*(3), 607-614.

Rank, M., Zaparanick, T., & Gentry, J. (2009). Nonhuman-animal care compassion fatigue: Training as treatment. *Best Practices in Mental Health Journal, 5*(2), 39-61.

Reijula, K., Räsänen, K., Hämäläinen, M., Juntunen, K., Lindbohm, M. L., Taskinen, H., Bergbom, B. & Rinta- Jouppi, M. (2003). Work environment and occupational health of Finnish veterinarians. *American Journal of Industrial Medicine, 44*(1), 46-57.

Reskin, B. F., & McBrier, D. B. (2000). Why not ascription? Organizations' employment of male and female managers. *American Sociological Review, 65*(2), 210-233

Ross, C. E., & Mirowsky, J. (1989). Explaining the social patterns of depression: control and problem solving--or support and talking? *Journal of Health and Social Behavior, 30*, 206-219.

Roxburgh, S. (1996). Gender differences in work and well-being: Effects of exposure and vulnerability. *Journal of Health and Social Behavior, 37* (3), 265-277.

Robinson, J., & Godbey, G. (1997). *Time for Life*. University Park. The Pennsylvania State University Press.

Rothbard, N., & Edwards, J. (2003). Investment in Work and Family Roles: A Test of Identity and Utilitarian Motives, *Personnel Psychology*, 56(3), 699-730.

Rupert, P. A., & Morgan, D. J. (2005). Work Setting and Burnout Among Professional Psychologists. *Professional Psychology: Research and Practice*, 36(5), 544.

Sacco, P., Bucholz, K. K., & Harrington, D. (2014). Gender differences in stressful life events, social support, perceived stress, and alcohol use among older adults: results from a national survey. *Substance Use & Misuse*, 49(4), 456-465.

Sanne, B., Mykletun, A., Dahl, A. A., Moen, B. E., & Tell, G. S. (2005). Testing the Job Demand-Control-Support model with anxiety and depression as outcomes: the Hordaland Health Study. *Occupational Medicine*, 55(6), 463-473.

Sayer, L. C., Bianchi, S. M., & Robinson, J. P. (2004). Are Parents Investing Less in Children? Trends in Mothers' and Fathers' Time with Children 1. *American Journal of Sociology*, 110(1), 1-43.

Schaufeli, W.B., & Taris, T.W. (2014). 'A critical review of the Job Demands-Resources Model: Implications for improving work and health'. In G. Bauer and O. Hämmig (Eds). Bridging occupational, organizational and public health. Amsterdam: Springer, in press.

Shirangi, A., Fritschi, L., Holman, C. D. J., & Morrison, D. (2013). Mental health in female veterinarians: effects of working hours and having children. *Australian Veterinary Journal*, 91(4), 123-130.

Sigurdardottir, A. O., Svavarsdottir, E. K., & Juliusdottir, S. (2015). Family nursing hospital training and the outcome on job demands, control and support. *Nurse Education Today*, 35(7), 854-858.

Siu, O. L., Cooper, C. L., & Phillips, D. R. (2014). Intervention studies on enhancing work well-being, reducing burnout, and improving recovery experiences among Hong Kong health care workers and teachers. *International Journal of Stress Management*, 21(1), 69-84.

Smarr, K. L., & Keefer, A. L. (2011). Measures of depression and depressive symptoms: Beck Depression Inventory- II (BDI- II), Center for Epidemiologic Studies Depression Scale (CES-D), Geriatric Depression Scale (GDS), Hospital Anxiety and Depression Scale (HADS), and Patient Health Questionnaire- 9 (PHQ- 9). *Arthritis Care & Research*, 63: Suppl 11S454–S466.

Smith, D. R., Leggat, P. A., Speare, R., & Townley-Jones, M. (2009). Examining the dimensions and correlates of workplace stress among Australian veterinarians. *Journal of Occupational Medicine and Toxicology*, 4, 1-8.

Smith, P. M., & Mustard, C. A. (2004). Examining the associations between physical work demands and work injury rates between men and women in Ontario, 1990–2000. *Occupational and eEnvironmental Medicine*, 61(9), 750-756.

Steiner, B., & Wooldredge, J. (2015). Individual and environmental sources of work stress among prison officers. *Criminal Justice and Behavior*, 42(8), 800-818.

Stincombe A.L (1968). *Constructing Social Theories*. New York: Harcourt Brace and World.

Spector P.E.(1992). *Summated Rating Scale construction: An Introduction*. Sage University series on Quantitative Applications in the Social Sciences, No. 07-082.Newbury Park, CA: Sage Publications.

Symoens, S., & Bracke, P. (2015). Work-family conflict and mental health in newlywed and recently cohabiting couples: a couple perspective. *Health Sociology Review, 24*(1), 48-63.

Thompson, B. M., Kirk, A., & Brown, D. F. (2005). Work based support, emotional exhaustion, and spillover of work stress to the family environment: A study of policewomen. *Stress and Health, 21*(3), 199-207.

Tims, M., Bakker, A. B., & Derks, D. (2013). The impact of job crafting on job demands, job resources, and well-being. *Journal of Occupational Health Psychology, 18*(2), 230-40.

Van der Doef, M., & Maes, S. (1999). The job demand-control (-support) model and psychological well-being: a review of 20 years of empirical research. *Work & Stress, 13*(2), 87-114.

Van Yperen, N. W., Wörtler, B., & De Jonge, K. M. (2016). Workers' intrinsic work motivation when job demands are high: The role of need for autonomy and perceived opportunity for blended working. *Computers in Human Behavior, 60*, 179-184.

van Woerkom, M., Bakker, A. B., & Nishii, L. H. (2016). Accumulative job demands and support for strength use: Fine-tuning the job demands-resources model using conservation of resources theory. *Journal of Applied Psychology, 101*(1), 141-150.

Verhoeven, C., Kraaij, V., Joeke, K., & Maes, S. (2003). Job conditions and wellness/health outcomes in Dutch secondary school teachers. *Psychology and Health, 18*(4), 473-487.

Verhoeven, C., Maes, S., Kraaij, V., & Joeke, K. (2003). The job demand-control-social support model and wellness/health outcomes: a European study. *Psychology and Health, 18*(4), 421-440.

Wallace, J. E. (2005). Job stress, depression and work-to-family conflict: A test of the strain and buffer hypotheses. *Relations Industrielles/Industrial Relations, 60*(3) 510-539.

Wallace, J. E. (1993).” Professional and organizational commitment: Compatible or incompatible?” *Journal of Vocational Behavior, 42*, 333–349.

Wallace, J. E., & Young, M. C. (2010). Work hard, play hard?: A comparison of male and female lawyers' time in paid and unpaid work and participation in leisure activities. *Canadian Review of Sociology/Revue canadienne de sociologie, 47*(1), 27-47.

Wheatley, D., & Wu, Z. (2014). Dual careers, time- use and satisfaction levels: evidence from the British Household Panel Survey. *Industrial Relations Journal, 45*(5), 443-464.

Wheatley, D. (2017). Autonomy in Paid Work and Employee Subjective Well-Being. *Work and Occupations,*

Willemse, B. M., de Jonge, J., Smit, D., Depla, M. F., & Pot, A. M. (2012). The moderating role of decision authority and coworker-and supervisor support on the impact of job demands in nursing homes: A cross-sectional study. *International Journal of Nursing Studies, 49*(7), 822-833.

Wood, A. M., Maltby, J., Gillett, R., Linley, P. A., & Joseph, S. (2008). The role of gratitude in the development of social support, stress, and depression: Two longitudinal studies. *Journal of Research in Personality, 42*(4), 854-871.

World Health Organization (n.d). *Health. Definition of health.* (WHO, 1948, 100). Retrieved from [http:// www.who.int/health/en/](http://www.who.int/health/en/)

Yakubovich, V. (2005). Weak ties, information, and influence: How workers find jobs in a local Russian labor market. *American Sociological Review*, 70(3), 408-421.

Yoon, S. L., & Kim, J. H. (2013). Job- Related Stress, Emotional Labor, and Depressive Symptoms Among Korean Nurses. *Journal of Nursing Scholarship*, 45(2), 169-176.

Zhang, W., O'Brien, N., Forrest, J. I., Salters, K. A., Patterson, T. L., Montaner, J. S., Hogg R.S & Lima, V. D. (2012). Validating a shortened depression scale (10 item CES-D) among HIV-positive people in British Columbia, Canada. *PloS one*, 7(7), e40793.

Appendix A: JDCS Coping Resources Moderator Results
(Standardised Regression Coefficients) (N=378)

Variables	Depression		Depression	
	Eq 1	Eq 2	Eq 3	Eq 4
Job control & Support as Moderators				
Autonomy x work overload	-0.01			
Autonomy x work hours	0.09			
Autonomy x unrealistic clients	-0.16			
Autonomy x client grief	0.27			
Autonomy x improper posture	-0.57*	-0.40*		
Autonomy x risk of injury and illness	0.13			
Autonomy x exposure to chemicals	-0.23			
Autonomy x exposure to radiation	0.37			
Schedule flexibility x work overload			0.03	
Schedule flexibility x work hours			-0.20	
Schedule flexibility x unrealistic clients			-0.33	
Schedule flexibility x client grief			-0.12	
Schedule flexibility x improper posture			0.19	
Schedule flexibility x risk of injury			-0.68*	-0.58*
Schedule flexibility x chemical exposure			-0.14	
Schedule flexibility x radiation exposure			0.02	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (one-tail test)

Note: Interaction terms were entered one block at a time, first with control resources followed by the support resources and the coefficients were estimated including all of the variables included in Table 4 (Equation 3). Equations 1 and 3 in Appendix A are the estimated coefficients including all the interaction terms and variables for depression and equations 2 and 4 includes only the significant interaction terms and all the variables in Table 4 (Equation 3) for depression. The significant negative coefficients indicate a buffer effect.

Appendix A: JDCS Coping Resources Moderator Results (continued)
(Standardised Regression Coefficients) (N=378)

Variables	Depression		Depression
Job control & Support as Moderators	Eq 5	Eq 6	Eq 7
Control over hours x work overload	-0.07		
Control over hours x work hours	-0.24		
Control over hours x unrealistic clients	-0.29		
Control over hours x client grief	0.05		
Control over hours x improper posture	-0.27		
Control over hours x risk of injury	0.08		
Control over hours x chemical exposure	-0.52*	-0.41*	
Control over hours x radiation	0.20		
 Social support as Moderators			
Coworker support x work overload			-0.20
Coworker support x work hours			-0.06
Coworker support x unrealistic clients			0.06
Coworker support x client grief			-0.31
Coworker support x improper posture			0.29
Coworker support x risk of injury			-0.16
Coworker support x chemical exposure			0.10
Coworker support x radiayion exposure			0.05

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (one-tail test)

Note: Interaction terms were entered one block at a time, first with control resources followed by the support resources and the coefficients were estimated including all of the variables included in Table 4 (Equation 3). Equations 1 and 3 in Appendix A are the estimated coefficients including all the interaction terms and variables for depression and equations 2 and 4 includes only the significant interaction terms and all the variables in Table 4 (Equation 3) for depression. The significant negative coefficients indicate a buffer effect.

Appendix B: Gender Interaction Results
(Standardised Regression Coefficients) (N=378)

Variables	Depression		Depression Eq 10	Gender-specific effects	
	Eq 8	Eq 9		Male Eq 11	Female Eq 12
Control variables					
Gender x marital status					
Gender x income	-0.15				
Gender x number of vets	-0.09				
Gender x years of experience	0.03				
Gender x type of practice	-0.03				
Gender x employment status	-0.07				
	-0.05				
Job demands					
Gender x work overload		-0.14			
Gender x work hours		-0.19			
Gender x unrealistic clients expectations		-0.17			
Gender x client grief		0.70			
Gender x improper posture and lifting		0.09			
Gender x risk of injury and illness		-0.34*		-0.09	0.17*
Gender x exposure to chemicals		-0.06			
Gender x exposure to radiation		0.30*		0.23*	-0.05
Job control					
Gender x autonomy			-0.06		
Gender x control over hours			0.04		
Gender x schedule flexibility			0.11		
Social support					
Gender x coworker support			-0.00		

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (one-tail test)

Note: Interaction terms were entered one block at a time, first with control variables and gender interactions followed by the job demands, job control and social support variables. The equations were estimated including all of the variables included in Table 4 (Equation 3). Equations 8, 9 and 10 are the estimated coefficients including each block of interaction terms and variables for depression. Equations 11 and 12 are gender-specific equations for men and women respectively which included all variables included in Table 4 (Equation 3).