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Perceived Job Stress and Life Style Behaviors' Effects on the Quality of Life of Registered Nurses

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Abstract

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MSN, Regis College, 1998

BSN, Regis College, 1994

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

The purpose of this quantitative study was to examine to what extent work demands as measured by perceived job stress affected the health-related quality of life (HRQOL) as determined by the number of unhealthy days of registered nurses in the United States. This study was also an investigation of the extent to which other variables such as body-mass index (BMI) and certain lifestyle behaviors affected the HRQOL (number of unhealthy days). The independent variables were perceived job stress, weight (BMI), and lifestyle factors such as tobacco and alcohol use, physical inactivity, and the mindful eating score, and the dependent variable was the HRQOL (measured by the summary index of unhealthy days) of the RNs. This study was guided by the enhanced DRIVE model which describes how individual differences interact with perceived job stress to affect health outcomes. A cross-sectional study design was used and relevant data to answer the research question were collected from 95 participants via a SurveyMonkey survey that was advertised in an e-newsletter from the Nurse Practitioner Association of Continuing Education as well as posted on LinkedIn groups. Logistic regression and Spearman's correlation were used to test the hypothesized associations. There were no statistically significant associations between BMI, alcohol use, smoking, inactivity, and the HRQOL. However, there was a weak correlation between perceived job stress, the mindful eating score, BMI, the total number of unhealthy days and the total number of days that the nurses' daily activities were affected by unhealthy days. The positive social change implication of this study is that, for nurses, awareness of perceived job stress is important in promoting a healthy lifestyle and reducing the risk of chronic diseases.

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Dedication

I dedicate this dissertation to my parents, Richard and Rosetta, who unfortunately were not able to witness the final project. I am forever thankful to them for raising me as a kind and generous person. I am thankful for their guidance and motivation throughout life to strive to be the best you can. I am thankful for the sacrifices that they made in order for me to succeed in life. I miss them greatly, but I know that they are watching over me. I love you both!

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I thank my 3 children, Nicole, Anthony, and Gino who have spent the last 8 years watching me work on this project and now my youngest is 18 years old. They did not understand the purpose of this as young children but now I hope they realize that I would not have been able to do it without their love and support. I thank and love them for allowing me to pursue my goal of completing this dissertation and doctoral degree.

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Chapter 1: Introduction to the Study

Introduction

Registered nurses comprise the largest segment of professionals in healthcare in the United States with greater than 3.1 million registered nurses (RNs) nationwide (U.S. Department of Health and Human Services, 2014). That number was most recently reported as approximately 3.6 million by the American Nursing Association [ANA], 2017). Most nurses would consider their profession as one of the most stressful occupations in the United States. However, the Forbes 2016 list of the top 10 stressful jobs does not list nursing (Forbes, 2016). The 2011 ANA Safety Survey revealed that 74% of nurses' top concern was about the effects of stress and overwork (ANA, 2011). This high percentage was reflected in the 2001 survey as well with 70% of nurses demonstrating this. These results demonstrate that stress has been one of nurses' top concerns for at least the past 10 years. Work stress can be caused by the working environment itself as well as individual and situational factors. The National Institute for Occupational Safety and Health (NIOSH) studied work stress and stated that "job stress poses a threat to the health of workers and in turn to the health of organizations" (NIOSH, 1999, p. 199). The relationship between job stress and illness was recognized as early as 1713 by Bernardo Ramazzini, (Franco, G. & Franco, F., 2001), whose major focus was on physical hazards but who also spoke of personal habits, behaviors, and psychosocial factors causing illness as well. Karasek and Theorell (1990) were also able to scientifically demonstrate the relationship of job stress and cardiovascular disease in 1990. Poor health behaviors such as smoking, risky alcohol consumption, physical

inactivity, and poor diet have been shown to increase mortality risk (Ford, Bergmann, Boeing, Li, & Capewell, 2012; Loef & Walach, 2012; Martínez-Gómez, Guallar-Castillón, León-Muñoz, López-García, & Rodríguez-Artalejo, 2013). The ANA also recognized this and declared that 2017 is the "Year of the Healthy Nurse" (ANA, 2017).

According to the 2014 Morbidity and Mortality Weekly Report (Centers for Disease Control and Prevention [CDC], 2014), the five leading causes of death of Americans (cancer, diseases of the heart, cerebral disease, chronic lower respiratory disease, and unintentional injuries) were identified from data collected from 2008-2010. Four of these diseases could be preventable by changing health behaviors such as tobacco cessation, maintaining healthy weight, and partaking in healthy physical activity, which can also aid in warding off chronic diseases such as hypertension, high cholesterol, and type II diabetes (CDC, 2014).

Work or job stress does not seem to affect everyone the same way because people do not perceive stress or cope with stress in the same way (American Psychological Association, [APA], 2015). Stress can lead to unhealthy coping strategies such as eating disorders, smoking, and alcohol use (Schneiderman, Ironson, & Siegel, 2005). According to the Stress in America survey in 2015, about two in five adults (39%) reported overeating or eating unhealthy foods in the past month due to stress, compared to 33% in 2014 (APA, 2015). King, Vidourek, and Schweibert (2009) found that nurses who report high levels of job stress were at increased risk of disordered eating behaviors including binge eating.

Mazurenko, Gupte, and Shan (2015) demonstrated that nurses who had health related issues, that is, disability or illness due to work related injuries and high physical demands, were more likely to leave the profession all together. According to the 2016 National Healthcare Retention and RN Staffing Report, the United States bedside RN hospital workforce in 2015 had a 17.2 % turnover rate, more than the 16.4% in 2014. (Nursing Solutions, Inc., 2015). The fact that RNs represent the largest proportion of healthcare professionals demonstrates the potential social change from this research. This research study was needed because it may raise awareness among nurses of how job stress may impact their lifestyle choices. Both job stress and unhealthy lifestyle choices could lead to poor health related quality of life. Positive social change can be made by nurses becoming more aware of how their stress affects their own health.

In this chapter I review the importance of studying job stress in nurses as well as examine possible behaviors in response to stress that could lead to poor health related quality of life (HRQOL). I explain the background, problem statement, purpose of the study, research questions and hypotheses, conceptual framework, nature of the study, definitions, assumptions, scope and delimitations, limitations, and significance of the study in this chapter.

Background

Past studies have alluded to the idea that nurses may not be taking care of themselves by choosing unhealthy behaviors to cope with their job stress (ANA, 2011; Cox & Cox, 1996; Mark & Smith, 2012; Miller, Alpert, & Cross, 2008; Zapka, Lemon, Magner, & Hale, 2009). This idea of nurses not caring for themselves led to the ANA's

launch of the “Healthy Nurse Health Risk Appraisal” in November 2013 with more than 3,200 RNs and RN students participating in the survey as of 2014. This survey examined “health, safety and wellness risks that RNs encounter in their daily personal and professional lives” (ANA, 2014, para.1). In the “Healthy Nurse Health Risk Appraisal” preliminary data, which cannot be generalized to the entire nursing community, 81% of participants believed that they were at a significant level of risk of workplace stress, and only 54% of participants agreed or strongly agreed that healthy food choices were available to them during work hours (ANA, 2014). In updated preliminary data from October, 2013-2014, there were 82% who felt there was a significant level of risk for workplace stress (ANA, 2017).

The Nurses’ Health Study (NHS) has been surveying nurses in the United States since 1976 with the original NHS, the NHS 2, and now recruiting for the NHS 3 survey. The surveys serve as a database for researchers all over the world. Much of the cohort study data is used as secondary data for multiple studies. One recent study done by Song and Giovannucci (2016) examined the contributions of common lifestyle factors to cancer burden by comparing the incidence of mortality between a group of people who had a healthy lifestyle (low risk) and those who had an unhealthy lifestyle (high risk) from two major cohort studies. One cohort study was the NHS and the other was the Health Professionals Follow-up Study. There were 16,571 low risk women and 11,731 low risk men compared to 73,040 high risk women and 34,608 high risk men (Song & Giovannucci, 2016). A healthy lifestyle pattern was defined as

> never or past smoking (pack-years < 5), no or moderate alcohol drinking (1 drink/d for women, 2 drinks/d for men), BMI of at least 18.5 but lower than 27.5, weekly aerobic physical activity of at least 75 vigorous-intensity or 150 moderate-intensity minutes (Song & Giovannucci, 2016, p. 199).

Participants meeting all four of these criteria made up the low-risk group; all others, the high-risk group (Song & Giovannucci, 2016). The population attributable risk or PAR was calculated for the incidence and mortality of total carcinoma. The results were: a PAR of 25% in the low risk women versus 48% in the high-risk women group and a PAR of 33% in the low risk men versus 44% in the high risk mean group. The PARs were even higher when the low risk group was compared to the U.S. White population (Song & Giovannucci, 2016).

Other countries have also studied nurses and job stress (Almajwal, 2016; Bang & Park, 2016; Najimi, Goudarzi, & Sharifirad, 2012; Nayak et al., 2016; Teixeira & Mantovani, 2009; Wu et al., 2011). A Brazilian study surveyed 23 participants who worked as nurses, aged 30 and 60 years, who had chronic hypertension and/or diabetes and/or dyslipidemia (Teixeira & Matnovani, 2009). The respondents reported four risk factors for cardiovascular illness including stress (25.06%) and hypertension (21.10%), followed by family history of chronic illness (18.90%) and obesity (14.40%; Teixeira & Mantovani, 2009). A study by Wu et al. (2011) supported the idea that HRQOL was influenced by "occupational stressors, personal strains, job burnout, and coping resources" in a population of Chinese nurses (Wu et al., 2011, p.164). In a nonnursing population, another study, by Wang, Serika, Styn, and Burke (2013) examined the

HRQOL among overweight or obese adults in the United States, specifically Pittsburgh, Pennsylvania. The results showed that a younger age, lower body mass index (BMI), and history of hypertension were some of the factors that affected the physical HRQOL (Wang et al., 2013). In contrast, an older age, having a history of hyperlipidemia, less perceived stress, and less binge eating behaviors were some factors that were related to better mental HRQOL (Wang et al., 2013).

Other studies have examined relationships between obesity and chronic illnesses in nonnursing populations. The results in the American Stress Report done in 2015 show that most adults report having at least one chronic illness (67%; APA, 2015). A Canadian researcher performed a meta-analysis of 89 studies of comorbidities related to obesity and overweight (Guh et al., 2009). The study showed statistically significant associations between obesity and type II diabetes, all cancers except esophageal and prostate cancer, all cardiovascular diseases, asthma, gallbladder disease, osteoarthritis and chronic back pain. The strongest association with overweight was the incidence of type II diabetes in females as well as obesity (Guh et al., 2009). One article did examine the impact of job stressors on the HRQOL of nursing assistants (NAs) who work in long term settings in Taiwan (Liang, Hseigh-Lin, & Chen, 2014). This study showed that NAs who perceived they had more job control had positive effects on their HRQOL. The researchers did find that NAs who worked 12 hour shifts had a better HRQOL than their peers who worked 8 hour shifts (Liang et al., 2014).

Most studies that ask about healthy eating or diet ask about the amount of fruits or vegetables that a person eats per day. Other questions may be about sugary drinks, sugary

foods, high fat diet, or fast foods. These types of survey do not measure the eating behavior of a person, especially as related to job stress. Mindful eating is a way of becoming more aware of not only what you eat but how you eat it as well. Mindful eating is defined as "a nonjudgmental awareness of physical and emotional sensations associated with eating" (Framson et al., 2009, p. 1). Many diets are geared to helping people lose weight through meal planning, record keeping, and portion control (Framson et al., 2009). Mindful eating skills assist people in recognizing when they are full, assess their feelings when they are eating, and assess for inappropriate cues to eat such as anxiety and stress (Framson et al., 2009).

This research study measured the perceived job stress of nurses and their HRQOL (measured by the summary index of unhealthy days) and analyzed for any significant relationships among demographic information and nurses' unhealthy lifestyles. This research was necessary to measure how American RNs perceived job stress at their work and to what degree job stress affected their HRQOL or number of physically and mentally unhealthy days. Nurses could agree that their jobs are stressful and do perceive stress at work but it is not known whether nurses understand the effect that job stress has on their HRQOL. Nurses are trained to care for other people and not so much for themselves. Since nurses are an integral part of the health team, the goal should be to ensure that stress levels in nurses are identified and that healthier coping strategies are promoted.

There is a gap in the literature related to American nurses and their HRQOL, including their examination of their own weight status as well as the presence of

unhealthy lifestyles resulting at least in part from job stress. The study also addressed mindful eating awareness or its absence. The research is timely and does identify with Healthy People 2020's goals and topics including chronic diseases such as diabetes, arthritis, nutrition and weight, occupational safety and health, and the HRQOL and well-being of the American population (Healthy People 2020, 2016).

Problem Statement

According to the Stress in America survey, the top four stressors reported by Americans were money, work, family responsibilities, and health concerns (APA, 2015). One of the more stressful work environments can be found in the healthcare arena. All nurses are vulnerable to work stress, and it has been noted in the literature that nursing is a stressful profession (Nayak et al., 2016). Many studies (Bang & Park, 2016; Johnston et al., 2016; King et al., 2009; Mark & Smith, 2012; Najimi et al., 2012; Qin, Zhong, Ma & Lin, 2016; Sarafis et al., 2016; Texeira & Mantovani, 2009; Tsai, 2012). Studies have been done to identify the causes of job stress in nurses, but very few have been done on the effects of stress on American nurses, particularly regarding their own HRQOL. Studies have shown that health-related factors and high physical demands can be related to RNs leaving the occupation altogether (Mazurenko et al., 2015). This may have been the first research study using primary data in the United States to examine the multiple variables of job stress, BMI, and lifestyle factors, including mindful eating, and to what extent these variables affected nurses' HRQOL by measuring the summary index of unhealthy days. The study also reviewed data about mindful eating and if it was associated with the number of unhealthy days.

Purpose of the Study

The purpose of this quantitative study was to determine to what extent work demands, as measured by perceived job stress, affected the HRQOL (as indicated by the number of unhealthy days) of registered nurses in the United States. In this study, I also investigated to what extent other variables such as BMI and certain lifestyle behaviors affected the HRQOL. The independent variables were perceived job stress, weight (BMI), and lifestyle factors including tobacco and alcohol (ETOH) use, physical activity, and mindful eating. The dependent variable was the HRQOL (as measured by the summary index of unhealthy days) of the RNs. Other demographic variables were also analyzed to see if other significant relationships could be identified.

Research Questions and Hypotheses

RQ1: Is there an association between perceived job stress and the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States?

$H_0$1 Perceived job stress is not associated with the HRQOL (as measured by the summary index of unhealthy days) in a sample of registered nurses in the United States.

$H_1$1 Perceived job stress is associated with the HRQOL (as measured by the summary index of unhealthy days) in a sample of registered nurses in the United States.

RQ2: Are there associations between BMI, alcohol use, tobacco use, and/or lack of physical activity and the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States?

$H_0$2: BMI, alcohol use, tobacco use and/or lack of physical activity are not associated with the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States.

$H_1$2: BMI, alcohol use, tobacco use, and/or lack of physical activity are associated with the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States.

RQ3: Is there an association between the Mindful Eating Questionnaire (MEQ) score and the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States?

$H_0$3: The MEQ score is not associated with the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States.

$H_1$3: The MEQscore is associated with the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States.

Conceptual Framework

The study utilized Mark and Smith's (2008) enhanced demands, resources, individual differences, and health outcomes (DRIVE) model. This research focused on work demands (perceived job stress) but not work resources. The enhanced DRIVE model is structured as a moderating model, with individual differences in variables interacting with job stress to influence health outcomes. The enhanced DRIVE model

was derived from several models used in the past. These models included (a) the jobs, demands, control model (JD-C) by Karasek in 1979; (b) the transactional model by Lazarus in 1990; (c) the jobs, demands, control, support model (DCS) by Karasek and Theorell, also in 1990; (d) the effort rewards imbalance model (ERI) by Siegrist in 1996; and (e) the job, demands, resource model by Demerouti, Bakker, Nachreinert, and Schaufeli in 2001. Due to the high rate of stress and obesity in nurses, the study done focused on work demands. Mark and Smith (2008) stated the "perceived job stress" question could be used as a reliable way to measure work demands (Mark & Smith, 2008, pp.23-24). Individual differences included demographic information as well as the weight (BMI) and lifestyle factors. The health outcome was the amount of physically and mentally unhealthy days totaled together. A more detailed explanation diagram of the DRIVE model is found in Chapter 2.

Nature of the Study

This study was quantitative in nature. I used a cross-sectional survey design that included multiple choice questions. I advertised the survey tool utilized in a Nurse Practitioner Associates for Continuing Education (NPACE) e-newsletter via a SurveyMonkey link that was sent to RNs in the United States who were members of NPACE. The survey also was advertised on LinkedIn nursing group sites as well. A nonexperimental quantitative approach was used because one of the purposes of quantitative research is to "assess whether relationships exist among variables and to measure how strong the relationship is" (Polit & Beck, 2014, p 46). The survey also included demographic information such as age, gender, ethnicity, type of nursing

license/degree, years of nursing experience, type of work shift, height and weight, smoking status, alcohol status, and activity status. The independent variables were perceived job stress, BMI, alcohol use, tobacco use, physical activity, and the MEQ score. The dependent variable was the HRQOL summary index of unhealthy days. I analyzed data using descriptive as well as inferential statistics. Descriptive statistics that I used included frequency distributions, measures of central tendency, and variability with standard deviations. Inferential statistics, binomial logistic regression, and Spearman's correlation were used to illustrate if there were any associations among multiple independent variables such as perceived job stress, BMI, alcohol use, tobacco use, and mindful eating score and HRQOL (as measured by summary index of unhealthy days). The dependent variable was the HRQOL, which was used as a categorical variable as fair/poor or good, very good, or excellent HRQOL and as an ordinal score of the sum of physically and mentally unhealthy days.

Definitions

Job stress: The harmful physical and emotional responses that occur when the requirement of the job does not match the capabilities, resources, or needs of the worker (NIOSH, 2008).

Advanced practice registered nurse (APRN): An RN who has a graduate degree and advanced knowledge. There are four categories of APRNs: certified nurse-midwife, clinical nurse specialist, certified nurse practitioner, or certified registered nurse anesthetist. These nurses can diagnose illnesses, and prescribe treatments and medications (National Council of State Boards of Nursing, 2012).

Registered nurse (RN): An individual who has graduated from a state-approved school of nursing, passed the NCLEX-RN Examination, and is licensed by a state board of nursing to provide patient care (National Council of State Boards of Nursing, 2016).

Body mass index (BMI): A person's weight in kilograms divided by the square of height in meters. It is used as a screening tool but not as a diagnostic test (CDC, 2016).

Health related quality of life: Aspects of overall quality of life that can affect physical or mental health. (CDC, 2016).

Mindful eating: "A nonjudgmental awareness of physical and emotional sensations associated with eating" (Framson et al., 2009, p. 1439).

Assumptions

I made the following assumptions in this study:

- The respondents would answer the survey honestly, and self-reported height and weight would be accurate.
- Due to the anonymity of the survey, the respondents would be able to answer without the fear of not giving the socially acceptable answer.
- Due to the inclusion criteria, all respondents would be RNs who worked in the United States.
- All respondents would have internet access because they were subscribers of the NPACE e-newsletter or members of LinkedIn.
- The RNs would be able to read and write in the English language.
- The NPACE e-newsletter readers would open their e-mail and read the newsletter and see the research study advertised.

- The NPACE e-newsletter would be sent to a wide variety of RNs and advanced practice nurses across the United States.

Scope and Delimitations

Since this was a cross sectional, nonexperimental, correlational study, the results cannot infer causation but could establish a relationship (Polit, 2014, p. 159). The goal was to address any other explanations to explain any relationships among the variables that were found and then ruled out. Temporal ambiguity threatened the internal validity of the study because I was not able to determine if the independent variable, perceived job stress, preceded the effects on HRQOL or if the HRQOL was modified by other external forces not studied here.

I did expect a more diverse sample than in past surveys that included male nurses and other ethnic groups of nurses, which could have revealed any health disparities. Exclusion criteria listed was that the participants would be working RNs. The study results could not be generalized to the United States due to a small unrandomized sample. There was a lower risk of selection threat because not all the participants were from the NPACE e-mail list because the LinkedIn social media site was used for recruitment as well; however, the sample still did not include the entire population of nurses in the United States. Most of the sample population were RNs who were not nurse practitioners even though NPACE is geared towards nurse practitioners.

Other conceptual models that were considered for the study were the strain hypothesis of the jobs demand control model that states that employees working in a high-strain job (high demands-low control) experience the lowest well-being ratings

(Karasek, 1979). Another model, the efforts reward imbalance model by Siegrist, stated that if the work efforts were high but the rewards were low then there would be an imbalance causing stress (Siegrist, 1995). Both models were not used due to the lack of a relationship with health outcomes.

Limitations

A limitation of a correlational, cross-sectional, and nonexperimental design includes the inability to prove causation. There also may be confounders such as age, gender, education, and type of conditions that may affect the results. Also, the sample was not randomized, which limited the ability to generalize to the entire population of nurses in the United States. The sample included members of NPACE and members of LinkedIn. Another sample bias was avoided by setting SurveyMonkey so that a person could not take the survey more than once. Participants may have quit in the middle of taking the survey, but surveys were collected on 103 participants, and 8 were not used due to incompleteness. Therefore, the final sample was 95. I briefly stated the purpose of the survey to the participants while being careful not to reveal too many details in the consent form.

Significance of the Study

In this research, I attempted to make an original contribution to the literature because there is limited research on perceived job stress with nurses and how their stressful work affects their HRQOL There have been no known recent studies done on all the variables such as weight and lifestyle factors including eating behaviors in the nurse population in the United States from a primary data source. The nursing workforce is in

demand right now (U.S. Department of Health and Human Services, 2014). This is due in part to the Affordable Care Act and to the aging of the Baby Boomer generation. This demand makes the health of the nurse an important issue (U.S. Department of Health and Human Services, 2014). The current nursing population is also older, with 50% of the population of American RNs aged 50 or older (Budden, J., Moulton, P., Harper, K., Brunnell, M., & Smiley, R., 2016). As the workforce becomes older, there may be more evidence of chronic diseases in the nurses themselves.

This research study contributes to the profession of nursing in numerous ways. It increases the knowledge of how perceived job stress affects the nurses' health, particularly their HRQOL. It also determines the relationship between perceived job stress, weight, and lifestyle factors including eating behavior and the HRQOL of the nursing population, particularly examining the number of unhealthy days. The research also utilized the enhanced DRIVE model, which is a moderating model. There has not been any research found that used this model with these variables or population in the United States. Awareness of how stress in the workplace can affect a nurses' personal health may lead to interventions to educate nurses about better coping strategies that in turn would increase the HRQOL of nurses. This increase in HRQOL could enhance the nurses' work performance and quality of their patient care.

This research could also increase nurses' awareness of poor lifestyle behaviors that may be detrimental to their own health. Even though nurses are trained to teach healthy lifestyles and be role models, almost 54% of a sample of nurses in the Miller, et al. (2008) study were overweight or obese. The assessment of nurses' eating behaviors

may also give nursing administrators and health providers' answers about how to incorporate mindful eating into the nurses' day. In another study of hospital-based nurses, findings indicated that most nurses were overweight and obese with poor self-reported health, diet, and level of physical activity (Zapka et al., 2009). The current research also incorporated variables that are targeted in Healthy People 2020's objectives in HRQOL and well-being, nutrition and weight status, and occupational safety and health (Healthy People 2020, 2015). This research also is timely with the ANA declaring 2017 as the "Year of the Healthy Nurse" and collecting data on nurses' health as well (ANA, 2017).

Positive social change could occur in the nursing occupation regarding occupational stress as well as its effect on a nurses' HRQOL. Occupational health would need to address this problem and strategize ways to decrease stress and assist nurses with their own care. Healthcare organizations could offer more programs at work to assist nurses in changing their lifestyle behaviors, managing stress, and associated chronic diseases as well as their weight. If there are ways to reduce stress and reduce the effects of stress on health in nursing, other occupational environments could also benefit. Employers could use mindful eating awareness campaigns to help nurses who have eating behaviors that are not addressed by diet alone. Additionally, it has been theorized that nurses with poor health behaviors such as overeating and smoking may not be the best role models for patients (McKenna, Naylor, & McDowell, 1998). The American Hospital Association reports that in 2014, there were approximately 36.2 million admissions to registered hospitals in the United States which makes nursing health a major

concern. Therefore, decreasing job stress could lead to healthier nurses, better work performance, and increased patient satisfaction.

Summary

Nursing has been identified as a stressful occupation. There is little research that has been done on nurses and their perceived job stress in the United States. This quantitative survey study was intended to provide further research into the relationships that may exist, if any, between perceived job stress and HRQOL (as measured by the number of unhealthy days) of registered nurses. The enhanced DRIVE model is described as an interacting model between individual differences and perceived job stress and how this affects the health outcome of the individual. This research also examined if other associations existed among BMI, alcohol, and tobacco use, and the MEQ score. The results of the research provided better insight about the health of registered nurses who work in the United States. Chapter 2 will provide a review of the literature on this topic.

Chapter 2: Literature Review

Introduction

Nursing is a stressful occupation despite not being listed on any "top ten most stressful occupations" list. In a survey done in 2011 by the ANA, 74% of nurses' top concern was the effects of stress and overwork (ANA, 2011). Throughout the years, nursing has become more stressful due to sicker patients, an aging nursing workforce, and longer shifts. A nurse not only has the patient to take care of but the family as well. Stress can cause unhealthy behaviors to occur. These unhealthy behaviors could be due to poor coping responses to stress and could lead to disease, which could affect a nurse's HRQOL. A study by Wu et al. (2011) supported the idea that HRQOL was influenced by "occupational stressors, personal strain, job burnout, and coping resources" in a population of Chinese nurses (Wu et al., 2011, p.163).

The purpose of this research was to investigate if work demands, measured by perceived job stress, affected the HRQOL (summary index of unhealthy days) of RNs in the United States. This study also examined whether BMI/weight, particularly obesity, and lifestyle factors such as alcohol use, tobacco use, absence of mindful eating, and lack of physical activity demonstrated any statistically significant relationships between perceived job stress and HRQOL of the American nursing force. This literature review did not yield any studies that involved these variables with the American nursing population. This study may possibly be the first research that examined the prevalence of obesity, alcohol use, tobacco use, mindful eating, and lack of physical activity in a sample of RNs in the United States. This chapter will illustrate the literature search

strategy, the conceptual framework, and a literature review of the independent and dependent variables.

Literature Search Strategy

The strategy used for the literature review involved using multiple data bases from the electronic library from Endicott College and Walden University. Databases included Ebsco, Emerald, ProQuest, PubMed Central, Sage Premier, and Google Scholar. Key terms used to search for job stress were *job stress, work stress,* and *occupational stress*. Search combinations were also used such as *nursing and job/work/occupational stress*. Key terms also searched were *nurses and health related quality of life, nurses and chronic illness, nurses and their own health*, and *job/work/occupational stress and illness*. The variable of weight was searched using the terms *nurses* and *obesity*. The variable of lifestyle behaviors was searched using the following terms: *poor eating, disordered eating, overeating, tobacco use, ETOH use, inactivity, mindful eating,* and *poor coping mechanisms*. Also, I searched for terms such as *lifestyle behaviors* and *HRQOL* and these terms combined with *nurses* and *job stress*.

The goal was to obtain peer reviewed articles from the past five years. However, some articles were in the five to ten-year range of publication but offered valuable information. There were several studies of nurses done in other countries, and these were included as well. Information was also obtained using books on certain topics such as job stress and behavioral factors as well as websites involving nursing associations, government research on occupational stress, poor coping methods, and behavioral

factors. Years searched included 2000 to 2015.The total literature search yielded over 200 peer reviewed articles. most being full text. All articles were peer reviewed.

Conceptual Framework

This study utilized Mark and Smith's (2008) enhanced DRIVE model. The study focused on all aspects of the model except for resources. The enhanced DRIVE model is structured as a moderating model, with individual differences in variables linking with job stress to influence health outcomes.

Mark and Smith (2008) first created a simple DRIVE model in hopes to find a "middle ground between simplicity and complexity" in a world of stress theories (p. 21). The "simple" version of the model uses independent variables such as work demands, work resources, individual differences, and health outcomes. The main difference between the simple and the enhanced version is the addition of perceived job stress. Mark and Smith hypothesized that perceived job stress was "the mechanism by which levels of workplace psychosocial demands and resources can affect health outcomes" (p. 24). This means that if persons did not perceive the work demand as stressful, then it would not affect their health. Various models of stress have been constructed over the years. The following models contributed to the support of the variables used in Mark and Smith's enhanced DRIVE model. The following is a summary of previous theories and variables:

The JD-C was initially developed by Karasek in 1979. Karasek theorized that excessive job demands (including both physical and psychosocial demands) could impact stress levels by themselves but that the demand was not the only important factor.

Karasek also stated that the amount of strain was also determined by the amount of control that individuals had over their work demands. The model demonstrated that if the employee had more decision latitude then the mental strain would be reduced without compromising the job demands. Some felt that this model did not specifically measure subjective versus objective "control," did not address whether the effects of demand and control were additive over time, nor could it be universally applied (Dewe, O'Driscoll, & Cooper, 2012). It also did not address individual differences but did have well defined concepts (Schaufeli & Bakker, 2004). Later, in 1990, a new variable was added of "support," which was named the DCS model.

Lazarus & Folkman first developed the transactional model of stress in 1981. Early definitions of stress were associated with a stimulus and a response to the stimulus. The transactional model of stress defines stress that arises from the appraisal that environmental demands are about to tax the individual resources, thus threatening individual well-being (Holroyd & Lazarus, 1982, pp. 21-35). Holroyd & Lazarus (1982) concluded that stress was too complex to be defined by two components. Stress was thought to be "transactional," meaning a transaction between the person and the environment. Lazarus stated that a "cognitive appraisal reflects the unique and changing relationship taking place between a person with certain distinctive characteristics (values, commitments, styles of perceiving and thinking) and an environment whose characteristics must be predicted and interpreted" (Lazarus & Folkman, 1984, p.24).

The ERI was developed by Siegrist in 1996 to try to predict and explain early cardiovascular-related outcomes due to stress. Siegrist related "active distress" caused by

activating the stress axes such as the autonomic nervous system response to stress. Siegrist believed if this stress was sustained, it could then lead to the development of cardiovascular disease and mental disease such as depression. In 1996, Siegrist applied these concepts to other psychological and behavioral outcomes which led to the ERI model. The job demands resource model (JDR) was proposed by Demerouti et al. (2001). It proposed that increased job demands led to strain and health impairment. In 2004, it was revised to include variables of "work engagement" and "burnout," which were thought to be mediators. They also included personal resources as well as job resources. This model was thought to be less restrictive, more flexible, and able to reach a broader audience. The enhanced DRIVE model uses similar concepts but has not been widely used. Mark and Smith (2008) discussed how their variables were similar to those in the past models. The enhanced DRIVE model used work demands to include job demands (JD-C and DCS models) and extrinsic effort (ERI model). The enhanced version also included perceived job stress to equate to job demands. Work resources included job control (JD-C and DCS models), social support (DCS model), and rewards (ERI model). Individual characteristics and personal resources and demands included coping styles, intrinsic effort, and demographics (JD-C, DCS, ERI, JDR and Lazarus' models). The health outcome included anxiety, depression, and job satisfaction (ERI and JDR models).

Mark and Smith did test the proposed DRIVE model in 2008. They used almost 1,200 participants from two working populations of nurses and university employees. They tested all the proposed relationships in the model and found strong evidence for

some key relationships and no support for others. The strongest evidence supported the following hypothesized relationships:

1. Work demands and work resources will significantly relate to outcomes.
2. Work demands and resources will significantly relate to perceived job stress.
3. Level of perceived job stress will significantly relate to outcomes.
4. Level of perceived job stress will significantly mediate the relationships between job demands/resources and outcomes.
5. Individual differences will significantly be related to outcomes.
6. Individual differences will moderate the effect of job demands on outcomes.

Mixed support was shown for the following hypothesized relationships:

1. Work resources will significantly moderate the effect of work demands in the prediction of health outcomes.
2. Individual differences in the form of personal demands and resources, will be significantly related to perceived job stress. (This was also listed as a nonsupported relationship as well).

No support was shown for the following relationships:

1. Work resources will significantly moderate the effect of work demands in the prediction of perceived job stress.
2. Job resources will significantly moderate the effect of perceived job stress in the prediction of health outcomes.
3. Individual differences will moderate the effect of job demands on perceived stress.

4. Individual differences will moderate the effect of perceived stress on outcomes (Mark &Smith, 2008, p. 24-25).

In another study by Mark and Smith (2011), they researched stress in health professionals, particularly nurses in the United Kingdom. The study examined the relationships between job characteristics and coping and its effects on nurses' anxiety and depression level. They had 870 nurses participate and used the DCS and ERI theories to support their work. They also used the DCS and ERI questionnaires for their surveys. It is not clear why they did not choose their own DRIVE model to use instead. They do mention the DRIVE model in their article stating that "while the more traditional models of DCS and ERI accounted for the majority of variance, there is clearly a significant contribution to be made by coping behaviors. These results support the DRIVE model." (Mark & Smith, 2011, p. 518).

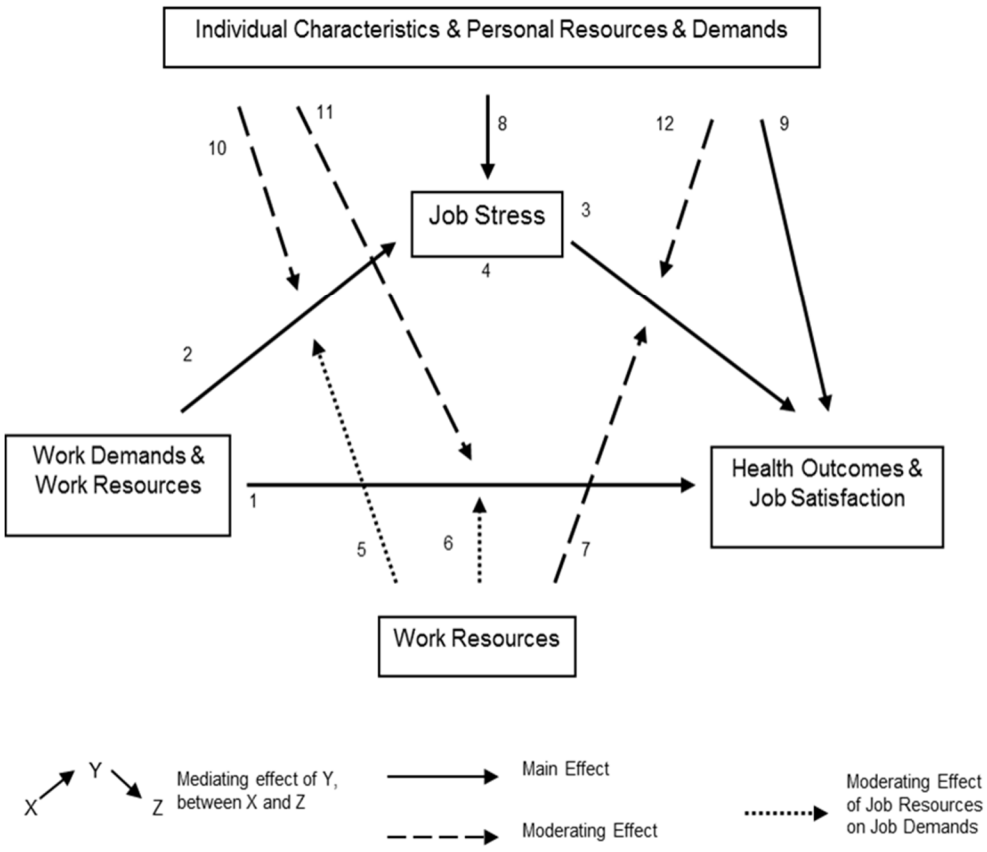

Figure 1. Mark & Smith's enhanced DRIVE model. Used with permission.

Work or Job Stress

Work stress has many different names including work stress, occupational stress, job stress, job stressors, and job demands. Americans are exposed to stress daily. The 2015 APA Stress in America survey which was conducted in 2014, found that 31% of adults were significantly stressed by money and 22% significantly stressed by work. The nursing occupation does provide a considerable amount of stress which at times may not be avoided. Menzies first described work stress in nursing in 1960. He identified the following 4 areas of anxiety: patient care, decision making, taking responsibility, and

change (Menzies, 1960). Even back in 1996, Cox and his colleagues identified that stress was a problem for nurses (Cox et al., 1996). They described that "the effects of work-related stress detract from the quality of nurses' working lives, and may contribute to some forms of physical illness" (Cox et al., 1996). Today, nursing still has these anxieties although the patients are sicker, the nurses are older, and the workday is longer causing more stress. Nurses have physical work stressors as well as emotional. A patient's condition can change at any time which can result in a life or death situation. Most hospital nurses must work different shifts including the night shift which causes more stress and unhealthy behaviors. In the 2011 ANA Health and Safety Survey, results from 4,614 nurses were reported. The top 3 concerns about their work environment included effects of stress and overwork (74%), disabling musculoskeletal injury (62%), and contracting an infectious disease (43%) (ANA, 2011).

NIOSH is a Federal agency involved in research to prevent work related illness and injury in the United States. NIOSH defines job stress as "the harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources, or needs of the worker" (NIOSH, 2008, p.1). There can be many sources of job or work stress (NIOSH, 2008). Sometimes the stress can be from the worker characteristics versus the working conditions or both (NIOSH, 2009). NIOSH describes stressors that are commonly seen in studies done on nurses such as work overload, time pressure, lack of social support at work, exposure to infectious diseases, needle stick injuries, exposure to work-related violence or threats, sleep deprivation, role ambiguity and conflict, understaffing, career development issues, and dealing with

difficult or seriously ill patients (NIOSH, 2008, p. 2-3). Work stress may cause psychological, behavioral, and/or physical effects. A person's coping mechanisms are also important to how he or she reacts to stress at work (NIOSH, 2008).

Selye described stress from as early as 1956. He found that stress, whether positive or negative, can cause a physiological response in the human body that can contribute to illness (Selye, 1956). Also, the duration and degree of stress can affect the impact on the person. The body usually responds to acute stress with the "fight or flight" response. The body identifies that there is a threat or danger which activates the neuroendocrine system to release epinephrine and norepinephrine (Selye, 1956). Chronic stress over time dysregulates the hypothalamic-pituitary-adrenal axis (HPA) (Selye, 1956). "The hypothalamus is a critical region in stress-response circuit also the regulation of feeding and energy balance." (Yau & Potenza, 2013, p. 4). Over time, if the HPA axis is malfunctioning it can cause alteration in glucose metabolism, promote insulin resistance, and increase appetite especially with stress (Yau & Potenza, 2013). Neuropeptides such as leptin, ghrelin, insulin, and orexin are all associated with the HPA axis and are involved with regulating food intake (Yau & Potenza, 2013). During stress, the limbic regions of the brain are hyper-activated (Berthoud, 2012). The limbic regions have also been implicated in memories of highly emotional events and reward-cue based feeding (Berthoud, 2012). There are many scales used to measure stress, but these are not always accurate.

Barrington and colleagues supported the use of perceived stress stating it is valuable because it accounts for "the differences in the appraisal of what is stressful,

exposure to stressors and coping ability" (Barrington et al., 2012, p 2). Mark and Smith (2008) found the use of a single question, "In general, how do you find your job?" with responses on a 5-point Likert scale from (0=not at all stressful) to (4=extremely stressful) would be "an accurate indicator." It has been used in other questionnaires to measure the same construct (Smith et al., 2008).

Coping Mechanisms

Lazarus described coping as a process "that is constantly changing cognitive and behavioral efforts a person makes to manage specific external or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus, 1999, p. 110). A person's response also depends on resources they have and learned abilities that they have such as stress management skills and mindful eating awareness. Yau and Potenza (2013) stated that "the perception and the appraisal of stress relies on specific aspects of the presenting external or internal stimuli. This may be mediated or mediated by personality traits, emotional state, and/or physiological responses." (Yau & Potenza, 2013, p 2).

According to the 2015 APA Stress in America survey, about two in five adults (39 percent) report overeating or eating unhealthy foods in the past month due to stress, compared to 33 percent in 2014. This represents a return to the percentage reporting the same in 2011. Unhealthy coping strategies can lead to overeating and binge eating (Fryer, Waller, & Kroese, 1997). "Individuals have different preferences and hence may differ in the type of self-medicating strategies they use to cope with stress" (Azagba & Sharaf, 2011, p.99).

Weight/Obesity

Obesity is a major epidemic in the United States. The National Health and Nutrition Examination Survey (NHANES) data from 2011-2014, listed the prevalence of obesity to be just over 36% in adults (Johnson, Dohrmann, Burt, & Mohadjer, 2014). The report also stated that obesity is higher in women and found more in the middle age and beyond age groups (National Center of Health Statistics, 2015). The National Health Interview Survey (NHIS) done in 2009-2010 reported similar statistics and reports that two thirds of the US population of 20 years and over are overweight or obese (National Center of Health Statistics, 2010). In the APA Stress in America survey for 2015, results showed that 58 percent of adults were overweight or obese (based on BMI calculated using self-reported height and weight), up one percent from 2014 (57%). In an ongoing study by the ANA, the preliminary data from October 2013-2014 of RNs and nursing students revealed the average BMI was 28 which is considered overweight (APA, 2017).

Obesity is usually defined in reference to the BMI (CDC, 2015). This number can be classified into underweight, normal weight, overweight, obese, and morbidly obese. It is a standardized measurement based on height and weight. The normal BMI is 18.5–24.9 with obesity defined as BMI over 30.

Many factors cause obesity, some not even understood yet. The usual cause is the number of calories taken in is more than the calories expended with activity. There are many factors that cause a person to overeat. One of these factors can be stress. During the stress response, the body releases adrenalin to deal with immediate danger (Goldstein, 2010). If the stress remains chronic, then the body releases cortisol which causes weight

gain. A person may deal with stress in unhealthy ways-that is, their exercise and unhealthy ways, binge eating and overeating in general with a lack of exercise. Individuals with high BMIs have a stronger association between chronic stress and weight gain than those with low BMIs with similar stress (Block, He, Zaslavsky, Ding, & Ayanian, 2009). Obese individuals demonstrated significantly higher activators in the brain reward regions during exposure to their favorite food cue and stress (Jastreboff et al., 2013). The American Nursing Association (ANA) conducted a Health Risk Assessment at a Health Nurse conference in June 2012. They surveyed approximately 350 nurses; seventy percent were either overweight or obese with 40% obese. There was an increased incidence of overweight or obesity in the age 30-39 group (ANA, 2016)

An immediate question is if nurses serve as "healthy" role models then why are so many nurses overweight and obese? A study done in 2008, reported 54% of nurses were overweight or obese from six states with most being overweight (Miller et al., 2008). The mean BMI ranged from 25.9 to 29.5 from all six states but the BMI range went as high as 59 .8 (Miller et al., 2008). In another study of hospital-based nurses, findings indicated that the majority of nurses were overweight and obese with low self-reported health, diet, and physical activity (Zapka et al., 2009). Another study used the Nurse Health Survey 2 data base to study the relationship of BMI, body shape, and endometriosis and covered a cohort of 116,430 RNs from 14 states from September 1989 to June 2011 (Shah, Correia, Vitonis & Missmer, 2013). In this cohort, the nurses were surveyed every two years. At their baseline (1989) there were 101,074 nurses with their BMIs listed. Approximately 70.4% had a normal or underweight BMI and only 18.4 % were overweight but the rest

were considered obese at 11 .1 % giving a combined total of almost 30% who are obese or overweight. These nurses were in their 30s and therefore were not representative of the older generation of nurses. Another study done by Jackson in 2016, examined the prevalence of obesity by industry of employment from 2004 to 2011. The data was taken from the National Health Interview Survey (NHIS) which was a series of cross sectional surveys using cluster probability sampling design with in person interviews of noninstitutionalized U.S. civilians with a response rate of 66%. Also, noted, the BMI was self-reported.

This study on the NHIS data demonstrated that the healthcare industry had the highest rate of prevalence of obesity at 32% after age was standardized. The researchers hypothesized that the following mechanisms affect the prevalence of obesity:

1. Food environments in the work place. This means what food is offered in the healthcare environment-for example a cafeteria or snack machines.
2. Physical environments and sedentary activity.
3. Job stress and the effect of lifestyle behaviors such as alcohol drinking patterns, smoking, sedentary tendencies, and sleep hygiene were related to obesity and/or weight gain.
4. Coworker behaviors such as celebrating festivities, coworkers may bring in candy, sweets, etc.
5. Psychological job strain which can modify endocrine factors associated with obesity.

6. Working long hours, shift work, fatigue, short sleep cycles can also increase obesity risk (Shah et al., 2013).

Chronic illness and disease have been associated with unhealthy lifestyles and obesity. It also has been shown to cause large increases in healthcare costs (Wang et al., 2008, Wolf & Colditz, 1998). A Canadian study performed a meta-analysis of 89 studies of comorbidities being related to obesity and overweight (Guh et al., 2009). The study showed statistically significant associations between obesity and type II diabetes, all cancers except esophageal and prostate cancer, all cardiovascular diseases, asthma, gallbladder disease, osteoarthritis, and chronic back pain. The strongest association in the overweight was the incidence of type II diabetes in females as well as obesity (Guh et al., 2009). Over time, chronic stress can be detrimental on the body causing illness and disease (McEwan, 2009).

Many studies have been done with job stress and weight in the general population. In 2005, Kouvonen, Kivimaki, Cox, and Cox examined the relationship between work stress and the BMI among 48,810 female and male employees. They found a relationship between lower job control, higher job strain, higher effort-reward imbalance, and higher BMIs. In 2006, Nishitani and Sakakibara researched Japanese male workers and found that they tended to have increased work demands and low job latitudes. The Whitehall II study was an occupational cohort studied over 19 years of civil workers in London, England. Brunner, Chandola, and Marmot (2007), investigated cumulative work stress as a predictor in obesity in the Whitehall II study and showed evidence that chronic work stress predicted general and central obesity. In a more recent study, Luckhaupt, Cohen,

Li, and Calvert (2014) studied work related factors that may contribute to an increased prevalence of obesity in the U.S. population. Overall, 27.7% of U.S. workers were obese. Factors such has working more than 40 hours a work and exposure to a hostile work environment were significantly associated with increased prevalence of obesity with modest differences.

Eating Behaviors

In a large-scale study done by Groesz et al. (2012), stress was related to various indices of the increased drive to eat including disinhibited eating, binge eating, and more frequent intake of hyperpalatable foods. A more recent study in 2016 by Almajwal, investigated the associated stress, shiftwork, and eating behavior in non-Saudi female nurses working in Central Saudi Arabia. It was a cross-sectional study of 395 female nurses who were surveyed from November 2013 to January 2014. The researcher examined different eating behaviors such as emotional eaters (those who eat more to cope with negative emotions), restrained eaters (those who tend to restrict food intake to control body weight but binge eat under stress), external eaters (those who eat due to external cues such as food triggers), and binge eating (those who eat unusually large amounts of food in one sitting and feel like their eating is out of control). A perceived stress score was used to measure stress in the nurses. The results concluded that in nurses who reported high level of stress, there was a 52% higher odds of abnormal restrained eating, 24% higher odds of abnormal emotional eating, and 21% higher odds of external eating compared to the nurses with low stress scores (Almajwal, 2016). In another study, participants with higher restrained eating had higher food intake during stress versus the

unrestrained eaters had less food intake during stress (Wardle, Steptoe, Oliver, & Lipsey, 2000). Those who are more rigid in diet such as restrained eaters, are less attentive to the cues of hunger and satiety which can lead to overeating as well (Yau & Potenza, 2013). Disinhibition behavior is the tendency to overeat in response to different stimuli (Adam & Epel, 2007). Stimuli can be good or bad and can be linked to emotional eating. The person is unable to stop eating when they are full. Disinhibition has been associated with excess body weight (Adam & Epel, 2007; Maniam & Morris, 2012). Disinhibited eating also strongly predicted weight gain and current BMI in adult women aged 55-65 years old (Hays et al., 2002). Distracted eating or task eating is eating while distracted-for example, watching TV on the computer, driving, etc.

A study by McNulty (1994) revealed a percentage of naval nurses were involved in disordered eating. The study found that 1.1% of nurses met the criteria for anorexia nervosa, and 12 % for bulimia. But another 36% did fall into the "not otherwise specified" (NOS) category (McNulty, 1994). Later a study on disordered eating and job stress among nurses was conducted by Dr. King and his colleagues in Ohio (King, Vidourek, & Schwiebert, 2009). A random survey was sent to 1,000 nurses in the state of Ohio. The total number of participants who completed the surveys equaled 435 nurses. Their results demonstrated that high levels of job stress increase the risk of disordered eating. The study wanted to investigate how many nurses were engaging in disordered eating and was this related to their perceived job stress and perceived body satisfaction. In their results, Dr. King and his colleagues, found that nurses reported frequently or always eating when they were stressed (as many as 33%). The percentage of nurses

reported thinking about or reaching for food when stressed was 29.1% with 11.6% reporting they were out of control after eating. The research also showed that nurses who reported higher levels of perceived job stress also had higher disordered eating scores (King et al., 2009). Another study investigated how often depression, stress, coping and binge eating occurred in 46 binge eating college women. They kept daily diaries for thirty days and documented when they had a depressed effect, stress, coping and binge eating episodes. They found that increased stress was associated with a higher risk of same day binge eating regardless of whether they were depressed or not (Freeman & Gil, 2004).

Mindful Eating

Mindful eating is defined as "a nonjudgmental awareness of physical and emotional sensations associated with eating" (Framson et al., 2009, p. 1). It is being aware of all the behaviors above or the triggers that cause the behavior. It is being aware of when satiety is reached and the ability to stop eating. It is being aware of external cues such as job stress and how to be aware of feelings during eating. External cues involve social factors, boredom, and using food as a reward system. It is being mindful of our emotional responses when we choose what we are eating and how we are eating. It is being mindful that while watching a movie, the person may not be aware that they are eating potato chips. Mindful eating addresses the chips to prevent eating the whole bag. It is proposed that because mindful eating awareness is not included in general weight loss programs or diets, it may be the reason for failure of diet interventions. It is not as simple as eat less and exercise more.

Mindfulness-based interventions for obesity have shown to improve eating behaviors. O'Reilly, Cook, Spruijt-Metz, and Black (2014) reviewed 21 articles on mindfulness-based interventions that targeted binge eating, emotional eating, external eating behaviors and dietary intake. The studies showed that 86% of reviewed studies reported improvements in targeted eating behaviors, 92% of reviewed studies reported improvements in binge eating frequency and/or severity, and 63% of reviewed studies reported positive changes in emotional eating behaviors (O'Reilly et al., 2014). O'Reilly et al. (2014) described which elements in mindfulness training act on mechanisms in eating behaviors. The main element in mindfulness training is learning skills that are necessary for the person to be aware and accept their thoughts and emotions. These skills help to distinguish emotions and physical hunger cues. These skills also help the person to avoid impulsive behavior in eating to cope with stressors.

Alcohol Use and Smoking

Alcohol, like food, can be used as a coping mechanism, as well, for job stress. The percentage of people in the United States who reported they drank alcohol at some point of their lifetime was 87.6%, in the last year was 71% and in the last month was 56.9% (CDC, 2014). The percentage of heavy drinkers in the U.S. was 6.7% for heavy drinking in the past month (CDC, 2014).

The CDC (2016) listed certain definitions for "moderate drinking" which is considered one drink per day or seven drinks per week for women, and two drinks per day or 14 drinks per week for men. Anything over that amount is considered "heavy drinking". As with smoking, there were no recent statistics available for alcohol use by

nurses in the United States. In the June 2012, ANA Health Risk Assessment survey of approximately 350 nurses found that most did not smoke or drink (ANA, 2016).

Tobacco, along with alcohol and food, can be used as a coping mechanism for dealing with job stress. The CDC (2015) recommended that people stop smoking since it is related to morbidity and mortality. It was difficult to find any current statistics on how many nurses smoke in the United States. The following statistics are from the 2014 CDC report of current rates of smoking in American adults. More men (18.8%) than women (14.8%) smoke, more 25-44-year-old adults smoke (20%), more non-Hispanic American Indian/Alaskan natives smoke (29.2%), and more people who have GED certificates smoke at 43% (CDC, 2015).

In 2004, researchers Head, Stansfeld, and Siegrist examined whether a stressful psychosocial work environment predicts alcohol dependence. They measured the alcohol dependence of participants in the Whitehall II occupational cohort conducted in London with data collected from 1991-1993 using the CAGE questionnaire (Head, Stansfield, & Siegrist, 2004). The researchers used the job demand-support-control model and the model of effort reward imbalance to measure work stress. The results showed that effort-reward imbalance at work was associated with alcohol dependence in men after adjusting for employment grade and other baseline factors related to alcohol dependence (Head et al, 2004). In women, low decision latitude was related to alcohol dependence and was more prevalent in higher occupational grades. Men with higher job demands and lower work social supports had a slightly reduced risk of alcohol dependence (Head et al., 2004).

In 2005, Kouvonen, Kivimaki, Virtanen, Pentti, and Vahtera demonstrated in their study that work stress defined as job strain and effort reward imbalance was associated with smoking. They used a large Finnish cohort (46,190) of female and male employees taken from two ongoing cohorts one from 10 towns and one from hospital personnel. The cohort was made up of 16% RNs and 8% practical nurses. The researchers also found that among smokers, higher work stress was associated with greater intensity of smoking (Kouvonen, Kivimaki, Virtanen, Pentti, & Vahtera, 2005). Another study done by Kouvounen and colleagues, on the same Finnish cohort, found that higher job strain and higher effort reward imbalance were not associated heavy drinking (Kouvonen et al., 2005). The ANA reported in their preliminary data from October 2013-2014, that 94% of RNs and nursing students (90%, 8%) were nonsmokers (ANA 2017).

Physical Activity

The APA Stress in America survey in 2015 showed that although 50 percent of adults reported engaging in exercise or physical activity that makes them sweat or breathe hard at least a few times a week, 22% reported never exercising or doing such physical activity. The survey also demonstrated that adults spend an average of 6.4 hours a day in sedentary activities, such as sitting or lying down, including time spent at a desk, watching TV, or on a computer. Forty-five percent of adults reported sedentary activity for 6-12 hours or more a day. In the ANA Health Risk Assessment done in 2012, out of approximately 350 nurses, only 35% exercised more than 4-5 items a week. (ANA, 2014). The 2015 CDC Recommendations for physical activity include the following:

- Two hours and 30 minutes (150 minutes) of moderate-intensity aerobic activity-for example brisk walking, every week along with muscle-strengthening activities on two or more days a week that work all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms); or,
- one hour and 15 minutes (75 minutes) of vigorous-intensity aerobic activity-for example jogging or running, every week along with muscle-strengthening activities on two or more days a week that work all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms); or,
- an equivalent mix of moderate- and vigorous-intensity aerobic activity along with muscle-strengthening activities on two or more days a week that work all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms); ten minute increments broken up throughout the day is also acceptable (CDC, 2015b).

Kouvonen et al. (2005) analyzed data of 46,573 participants from a Finnish public sector cohort using Karasek's demand/control model and metabolic equivalent task (MET) index to examine if leisure time play activity was decreased due to work strain. They found that both women and men with high work strain (low control, high demands), passive jobs (low control, low demands), and low job control had 2.6 to 5.3 MET-hours per week less that those with strain and high control (Kouvonen et al., 2005). Active jobs with high control and higher demands were associated with even lower mean MET hours in men and older workers (Kouvonen et al., 2005). In 2016, Oshio, Tsutsumi, and Inoue, studied job stress and leisure time physical inactivity after adjusted for individual

attributes in a Japanese occupational cohort survey with 31,025 observations of 9,871 individuals. The odds ratio of physical inactivity was 22% higher for those with high strain jobs (high demands, low control) and 17% higher for those with active jobs (high demands, high control) than those with low strain jobs. The odds ratio of physical inactivity was 28% higher in high effort, low reward jobs and 24% higher in high effort, high reward compared to low effort, high reward jobs (Oshio, Tsutsumi, & Inoue, 2016).

Nam and Lee (2016) examined the association of occupational factors with obesity and leisure time physical activity among nurses. They randomly selected from the California Board of Registered Nurses and surveyed 394 nurses from January to July 2013. Forty one percent engaged in regular aerobic physical activity (greater than or equal to 150 minutes per week) and 57% performed regular muscle strengthening activity (greater than or equal to two days per week). Regular aerobic physical activity was significantly associated with high job demands and nurses with passive jobs were significantly less likely to perform aerobic physical activity (Nam & Lee, 2016).

Health Related Quality of Life

What is the difference between quality of life (QOL) and health related quality of life (HRQOL)? These words are used interchangeably in the literature but quality of life is broader encompassing all the facets of life versus heath related quality of life examines specifically how a person's health status affects their quality of life. The CDC created the HRQOL-14 to measure health related quality of life (CDC, 2016). HRQOL has also been an initiative under Healthy People since 2000 and has been related to both chronic

diseases, as well as the risk factors for those diseases. All the variables in this study can affect a person's HRQOL.

Research done on work stress affecting nurses' health related quality of life in the United States seems to be scarce or even nonexistent. One article (Liang, Hseih, Lin, & Chen, 2014) examined the impact of job stressors on the HRQOL of NAs who work in long term settings in Taiwan. This study showed that NAs who perceived they had more job control had positive effects on their HRQOL. The researchers found that NAs who worked 12 hour shifts had a better HRQOL than their peers who worked 8 hour shifts (Liang et al., 2014).

A cross-sectional study (Teles et al., 2014) examined 797 Primary Health Care workers in Brazil which included nurses, their quality of life, and adverse psychosocial work conditions using the Effort-Reward Imbalance model. Poor quality of life affected 15.4% of the workers. Workers who had an imbalance in Effort-Reward had a higher probability of generally poor quality of life which included the physical and environmental domains as well. The workers who had a low effort/low reward had a poorer quality of life in the social domain. This study did "make an association between adverse psychosocial work conditions and poor quality of life among Primary Health Care workers" but not solely nurses (Teles et al., 2014, p. 11).

Another non-healthcare study (Tsai, 2012) also conducted in Taiwan examined work stress in white collar workers and how this affected their HRQOL. The participants were primarily men and under age 40. Sixty two percent reported perceived work-related stress. The findings revealed that participants with higher perceived work-related stress

consumed more alcohol, reported more hyperlipidemia, greater neck pain, poorer sleep, and more mild/moderate/severe depression than those who had lower perceived work-related stress (Tsai, 2012).

The quality of life of those who are obese can be affected as well. A French study (Folope et al., 2012) examined the factors causing poor quality of life in obese participants particularly psychological distress, eating disorders, impaired body image perception, and physical health difficulties. There were 130 obese patients who were referred to a nutrition unit in a French hospital to lose weight between January and May 2011. The overall QOL was poor in 16.4% and intermediate in 61.8% of the sample. The participants were primarily women and reported poorer QOL, worse social QOL, and unhealthier physical impact of their obesity than the men (Folope et al., 2012). This study also demonstrated that out of 125 patients who completed the eating disorder questionnaire there were 58.4% who had an eating disorder and most were women. Patients with a positive screening for eating disorders had a poor quality of life as well (Folope et al., 2012).

Another study (Wang, Serika, Styn & Burke, 2013) examined the HRQOL among overweight or obese adults in the United States specifically Pittsburgh, Pennsylvania. The purpose of the study was to identify factors associated with the HRQOL of overweight and obese participants. This study examined factors including BMI, perceived stress and binge eating. The sample included 210 people who were predominantly White, female, middle aged, with an average BMI of 34 (obese) (Wang et al., 2013). The factors were compared to which affected the physical aspects of HRQOL and which affected the

mental aspects of HRQOL. Interestingly enough, a younger age, lower BMI, and history of hypertension were some of the factors that affected the physical HRQOL. In contrast, an older age, a history of hyperlipidemia, less perceived stress, and less binge eating were some of the factors that were related to better mental HRQOL (Wang et al., 2013).

Using the EQ-5D to measure HRQOL, Vogl, Wenig, Leidl, and Pokhrel, in 2012, examined the HRQOL of smokers, ex-smokers, and never smokers in the general population of 13,241 participants from the 2006 round of Health Survey for England. They found that heavy smokers compared to never smokers were significantly more likely to report some to severe problems in all five domains such as mobility, self-care, usual activity, pain/discomfort, anxiety, and depression (Vogl et al., 2012). They adjusted for biological, clinical, lifestyle, and socioeconomic conditions. The degree of association was determined by the number of cigarettes smoked (Vogl et al., 2012).

In 2008, Sarna, Bialous, Cooley, Jun, and Feskanich, examined the relationship between smoking and HRQOL including the impact quitting had on two Nurses' Health Study cohorts. This data was collected from 158,736 participants, aged 29-71 years old, during 1992 and 1993 and was measured by the SF-36 scale used to measure HRQOL. Smokers were found to have lower HRQOL as compared to never or former smokers (Sarna, Bialous, Cooley, Jun, & Feskanich, 2008). Current smokers, cigarettes per day, and time since quitting all were significantly associated with lower SF-36 scores. Interestingly enough, quitting alone after an average of 21 years of smoking did not improve the HRQOL (Sarna et al., 2008).

In 2016, Chavez et al., studied the alcohol drinking patterns and the HRQOL in a U.S. adult population sample of 17,440 participants using data from the participants in the National Health Interview Survey from 1999-2002. The researchers used the AUDIT-C for alcohol use screening and mapped to the EQ-5D and SF-6D (both HRQOL measurement tools). The adjusted EQ-5 preference weights for non-drinking and moderately unhealthy drinking were significantly different from low risk drinking but no other differences were significant (Chavez et al., 2016). The very severe unhealthy alcohol use was not significantly associated with lower HRQOL, but researchers believe that the "generic measures may not capture important differences in HRQOL for alcohol use" (Chavez et al., 2016, p.206). Researchers Kim and Kim in 2015, investigated the association between alcohol consumption patterns and HRQOL in a nationally representative sample of South Korean middle aged and older adults. The data was taken from the 2010-2011 Korea National Health and Nutrition Examination Survey and sampled 3,408 men and 3361 women who were greater or equal to 40 years in age (Kim & Kim, 2015). The researchers used the AUDIT scores to measure alcohol consumption and the EG-5D to measure HRQOL. The HRQOL of moderate alcohol drinkers was higher than that of non-drinkers and heavy drinkers (Kim & Kim, 2015). This implies that moderate alcohol improves the HRQOL versus not drinking or drinking too much.

In 2009, researchers investigated whether physical activity in U.S. adults, with and without limitations, had greater than or less than 14 unhealthy days out of 30 days (Brown, Carroll, Workman, Carlson, & Brown, 2014). They used the 2009 Behavioral Risk Factor Surveillance System with secondary data used from 357,665 participants and

controlled for demographics, BMI, smoking, and heavy alcohol use. The group of adults without limitations who performed any physical activity (10-60 minutes per week) had lower than 14 unhealthy days compared to the inactive group (Brown et al., 2014). In 2014, Duncan, et al. (2014), performed a cross-sectional study examining the associations between multiple lifestyle behaviors and HRQOL in the 10,000 Steps Cohort. The study was conducted on 10,478 participants and revealed that when the participants engaged in a greater number of poor lifestyle behaviors (alcohol, tobacco, physically inactive, more sitting time, and lack of sleep), they also had a higher prevalence of poor HRQOL (measured by the number of unhealthy days). Sleep quality exacerbated this association. (Duncan, et al., 2014).

Summary and Conclusions

After a thorough literature review, stress has been identified as affecting weight, eating behavior, and other lifestyle behaviors. Some of these lifestyle behaviors have been known to cause poor health outcomes. There have not been many studies conducted on American nurses' job stress, and lifestyle behaviors. A relationship could be proposed that behavioral risk factors such as smoking, alcohol use, mindless eating and a lack of exercise could be caused by job stress which also could affect weight, increasing the risk of obesity which can then cause chronic diseases thus causing a decreased HRQOL. These factors can start a cycle of stress in general. The ability to intervene at any point in this cycle would be very beneficial to the health of nurses. This study could help to understand if there are significant relationships among the variables in the nurse

population and provide more definitive statistics for this group. Chapter 3 will provide an overview of the research methods, data collection, and data analysis for this study.

Chapter 3: Research Method

Introduction

The purpose of this quantitative study was to examine whether work demands, measured by perceived job stress, BMI, mindful eating, and lifestyle factors affected the HRQOL indicated by the total of physically and mentally unhealthy days of registered nurses in the United States. This study also explored whether there were any significant relationships among demographic data such as age, gender, experience, education, and work shifts. The independent variables were perceived job stress, BMI, mindful eating, alcohol use, tobacco use, and physical inactivity. The dependent variable was the HRQOL, which was measured by the total of the physically and mentally unhealthy days of the participants. In Chapter 3, I explain the research design as well as the rationale for choosing this design. I further describe the target population, sampling procedures, and the data collection process. I identify the instruments used in the study as well as the demonstrated reliability and validity of these instruments used in other studies. I illustrate the relationship between the variables and the research questions as well as the data analysis plan used for the study. I also discuss threats to validity and any ethical concerns.

Research Design and Rationale

The research design was quantitative, nonexperimental, correlational, and cross-sectional. “Correlational studies are used to examine relationships between variables but do not attempt to infer causal connections” (Polit & Beck, 2014, p. 159). The independent variables were perceived job stress, BMI, mindful eating, alcohol use, tobacco use, and

physical inactivity. The dependent variable was the HRQOL measured by the total physically and mentally unhealthy days. The design was cross-sectional, meaning there was one point in time that I collected the data. This type was chosen due to time and budget constraints. The research included close ended questions as well as a formal instrument that was made available through a SurveyMonkey link. One of the many benefits of using a survey design is that it is a convenient way to obtain data from many people. It is a way to try to generalize a target population and make inferences on their attitudes, characteristics, and beliefs (Creswell, 2009). The strategy was to use the internet which would make it easier to reach more participants, offering potential for greater diversity in the participant sample, as well being a more economical choice. The data collection included a self-administered questionnaire that was created using SurveyMonkey. SurveyMonkey facilitated organization and structure of the survey. The survey web link was advertised in an e-newsletter sent out by Nurse Practitioners Associates of Continuing Education (NPACE) and posted on nursing group social media sites in LinkedIn.

Methodology

Population

The target population was all RNs who were currently working in the United States including advanced practice nurses. The estimated target population was greater than 3.1 million RNs nationwide, which has been reported by the Kaiser Family Foundation (2017). This size was approximate since not all licensed RNs are currently employed. The accessible population for this study was all RNs in the United States who

were emailed the NPACE e-newsletter and who belonged to nursing groups on LinkedIn social media site.

Sampling and Sampling Procedures

I took two approaches to advertise the survey to potential participants. The SurveyMonkey link was advertised for free on several nursing group sites on LinkedIn over a timespan from December 17, 2016 to March 13, 2017. Also, a nonrandomized sample of 47,844 e-newsletters were e-mailed to NPACE members on February 7, 2017 and 47,904 e-newsletters were e-mailed again on February 21, 2017 by NPACE. This e-newsletter included my advertisement of the SurveyMonkey link. I assumed that the both e-mailing dates included the same members. The cost was $700.00 for the advertisement. The advertisement detailed the inclusion criteria which was that the participants must be an RN or APRN in the United States and be working in the United States presently or at least within the last 6 months. Those excluded from the study were individuals who were not an RN or APRN in the United States, an RN or APRN who did not work in the United States, and/or an RN who had not worked in the past 6 months.

A sample size was determined using a sample size calculator by Creative Research Systems. A population of 47,844 with a confidence interval of 5 and a confidence level of 95% would need 381 completed surveys. The population was set at 47,844, with a 95% confidence interval, and the worst-case scenario percentage set at 50%. This yielded a confidence interval of 9.89. I conducted a power analysis to determine the number of participants needed to demonstrate statistical significance and to avoid making a Type II error for each test used. RQ2 was analyzed with binomial logistic

regression. The first and third questions were analyzed with the Spearman's correlation test. I used the power analysis by G Power 3.1.9.2 and downloaded the program. The G Power settings for logistic regression were tail of one, odds ratio of 1.3, Pr(y=1/x=1)HO = 0.2, alpha was set at 0.05, power set at 0.80, which gave the total sample size of 568. A confidence level of 95% was used since it is a significant level of likelihood that the results are true. An alpha level of significance of .05 that measures the probability of making a Type 1 error was used. The Spearman's correlation sample size was calculated using a calculator that demonstrated that the 2-tailed alpha was set at 0.05, beta at 0.20 and r of 0.20 which projected a desired sample size of 194 participants (Hulley, Cummings, Browner, Grady, & Newman, 2013).

Procedures for Recruitment, Participation, and Data Collection

The survey was deployed using the SurveyMonkey design platform. The IRB approved the research plan prior to study initiation (# 01-18-17-0158838), and I contacted the advertising manager at the NPACE group to purchase the advertisement. I paid $700.00 for an advertisement spot in their new e-newsletter which was sent out to approximately 50,000 NPACE members on February 7 and February 21, 2017. The advertisement included an invitation to participate in the survey if the person met the inclusion criteria. To participate, the nurse had to place the SurveyMonkey link in their internet browser and complete the survey. The first page of the survey included the participant information sheet which consisted of the consent form, the background information, the procedure, examples of the questions, risks, benefits, privacy concerns, and who to contact with questions. If they wished to participate, the nurses proceeded to

the survey. Another survey link was posted in various nursing groups on LinkedIn as an alternative way to collect more data.

The survey tool included questions about demographics including age, gender, ethnicity, the number of years they had been a RN, the type of practice they worked in, their highest educational level, shift worked, the number of work hours per week, which department they worked in, whether they had more than one job, and their level of practice (RN or NP). The survey tool also included one Likert question about perceived job stress, the self-reported height and weight (the BMI was formulated by me), and the MEQ (28 items). The survey tool also included questions about lifestyle behaviors such as tobacco use (1 item), alcohol use (1 item) and physical activity (1 item) based on the recommendations by the CDC, and the four items of the Healthy Days Core Module (HRQOL-4), which included the number of physically unhealthy days, the number of mentally unhealthy days, the number of days their daily activity was impaired by these unhealthy days, and their self-rated health (excellent, very good, good, fair, and poor). The survey had 50 items including demographics and was expected to take about 15 minutes to finish.

Data was collected using SurveyMonkey so that the collected data would be organized and secured in a safe environment. The advertisement ran in the two e-newsletters two weeks apart and the data was going to be collected over a period of a month. When a participant completed the survey, there was a brief thank you for participating in the survey. My school e-mail address was also listed in the beginning of

the survey should there be any concerns or questions. I have not received any e-mails from any of the participants.

Instrumentation and Operationalization of Constructs

Table 1 represents the operationalization of constructs. The following constructs are discussed below Table 1.

Table 1

Operationalization of Variables

Name of Variable	Type of Variable	Information Obtained	Possible Responses	Treated As
Perceived Job Stress	Ordinal	Question # 17 on survey	-Not at all stressful - Mildly stressful -Moderately stressful -Very stressful - Extremely stressful	Ordinal
Body Mass Index (BMI)	Ratio or Continuous	Questions #15 and #16 on survey	Height and weight will be calculated into BMI using CDC BMI calculator. " "	Ratio or continuous BMI number
Current smoking status	Categorical	Question #12 on survey	-Current tobacco smoker -Former tobacco smoker (more than 100 cigarettes in lifetime)	"Nonsmoker" = 0 or "Smoker" = 1
Current alcohol intake status	Categorical	Question #13 on survey	-Nondrinker. -Follows the CDC recommendations of 1 drink per day for women and 2 drinks per day for men. -Drinks less than the CDC recommendations of 1 drink per day for women and 2 drinks per day for men. -Drinks more than the CDC recommendations of 1 drink per day for women and 2 drinks a day for men.	"Drinks less than CDC's recommendations or none" = 0 "Drinks the same or more than CDC's recommendations" = 1

(*table continues)*

Name of Variable	Type of Variable	Information Obtained	Possible Responses	Treated As
Current weekly physical activity	Categorical	Question #18 on survey	-I perform at least 150 minutes per week of moderate aerobic activities-such as brisk walking. -I perform at least 75 minutes per week of vigorous aerobic activity-such as jogging or swimming. -I perform a mixture of both moderate and vigorous aerobic activity for at least 75 minutes per week. -I perform some low level aerobic activity weekly for at least 75 to 150 minutes. -I do not do any kind of aerobic activity.	Answers 1,.2, and 3 are considered per CDC guidelines for physical activity and are considered "Physically Active per CDC guidelines" = 0. Answer 4 and 5 are considered "physically active less than the CDC guidelines or not at all" = 1.
Health Related Quality of Life (HRQOL)	Categorical and Continuous	Healthy Days Core Module Q48,49, 50	Q 48 Excellent, Very good, Good, Fair, Poor Q49. # of days, unhealthy physical days, score can range from 0-30. Q50. # of days of unhealthy mental health days, score can range from 0-30. Q51. # of days that poor physical or mental health has kept the person from doing their usual activities, score can range from 0-30.	Q 48 will be reported as a frequency The sum of questions 49 and 50 are added together to give a "Summary Index of unhealthy days" which can range from 0-30. Any amount over 30 is counted as 30. A sum of 0-13 will be recoded as "0" and 14-30 will be recoded as "1" for a dichotomous variable Q 49, Q50, and Q 51 will also be used as continuous variables as well.

Perceived Job Stress

The variable of perceived job stress was measured by one question, proposed by Mark and Smith's Enhanced DRIVE Model (2008), "In general how do you find your job? "with a 5 point Likert scale from 0-4 with 0 "not at all" and 4 "extremely stressful". Permission to use this question, which is part of the Enhanced DRIVE Model, was granted by Dr. Smith (Appendix I). This question was appropriate because everyone perceives stress differently. This variable was treated as an ordinal variable since it is a Likert scale.

Body Mass Index

I calculated the BMI from the participants' self-reported height and weight. The BMI is not to be used as a diagnostic tool but rather a screening method. The following formula is used with weight and height. Formula: weight (lb.) / [height (in)]2 x 703. Calculate BMI by dividing weight in pounds (lbs.) by height in inches (in) squared and multiplying by a conversion factor of 703 (CDC, 2015). The CDC BMI calculator was used to calculate each participants BMI. A BMI below 18.5 is considered underweight, 18.5-24.9 is considered normal or healthy weight, 25.0-29.9 is considered overweight, and a BMI of 30.0 or above is obese with over 40 described as morbidly obese (CDC, 2015). The BMI is an appropriate test to use since it is recognized throughout the United States as a common health measurement. The BMI was used as a ratio or continuous variable with the measurement reported and the participant's BMI was also classified as underweight, healthy weight, overweight, obese, or morbidly obese per the guidelines (CDC, 2015) in the results section.

Mindful Eating Questionnaire

The MEQ is a 28-item scale used to measure the construct of mindful eating. It was developed and published in 2009 by Dr. Alan Kristal and his colleagues through the Fred Hutchinson Cancer Research Center (Framson et al., 2009). The researchers wanted to evaluate whether yoga increased mindfulness and mindful eating. In order to develop the questionnaires, the researchers examined published research in eating behavior and mindfulness to generate a list of potential constructs. The following scales and questionnaires were reviewed; the Three Factor Eating Scale, the Dutch Eating Behavior Questionnaire, and the Emotional Eating Scale. The researchers narrowed down to three constructs which were disinhibition (inability to stop eating when a person is full), external eating (eating in response to environmental cues), and emotional eating (eating in response to negative emotional states). The researchers also included cognitive restraint to evaluate it as independent from mindful eating. Cognitive restraint is consciously decreasing food intake to lose weight or maintain weight.

In developing the MEQ (Framson et al., 2009), Dr. Kristal analyzed the Mindful Attention Awareness Scale, the Freiburg Mindfulness Inventory, the Kentucky Inventory of Mindfulness Skills, the Cognitive and Affective Mindfulness Scale and the Mindfulness Questionnaire. Kristal and colleagues performed a factor analysis of the items from the five scales to choose two constructs. These constructs included observing, noticing, or attending to sensations, perceptions, thoughts, and feelings and acting with awareness. These were further broken down into organoleptic awareness which is being aware of and appreciating the effects of food on the senses. The second construct was

affective sensitivity which is an awareness of how food affects internal states. The third construct was distraction which focuses on other activities while eating.

Dr. Kristal and colleagues (Framson et al., 2009), then developed an item pool. They generated 2-6 items for each of the seven-eating behavior and mindfulness constructs. The item pool resulted in 40 items with response options of "never/rarely", "sometimes", "often", and "usually/always". They also performed a 2-staged pilot study. One stage was an interview with five participants aged 28-60 to make sure the items were intelligible which deleted some items. The second stage was sending the modified 37-item questionnaire to 20 nutrition professionals for their clarification. The final survey was a 28–item questionnaire.

Dr. Kristal used a cross-sectional study with data collected from January to May 2007 to validate the MEQ (Framson et al, 2009). They mailed the questionnaire to different groups that totaled to 510 people. There were seven convenience samples including 200 at a yoga studio, 100 at a university fitness facility, 40 at a weight loss program, 40 at a software development company, 40 at a women's weight loss and fitness facility, 40 at a non-profit company and 50 teachers and administrators at a prep school. The researchers also examined the weight, height, age, sex, race/ethnicity, highest level of education, yoga practice information, walking, and strenuous physical activity amounts.

Dr. Kristal performed an exploratory factor analysis and the final scale consisted of 28-items with five subscales (Framson et al., 2009). The five subscales were Disinhibition, Awareness, External Cues, Emotional Response, and Distraction. Each

item was scored 1 to 4; higher scores meant more mindful eating. The summary score was the mean of the five subscales excluding any not applicable responses. The researchers performed statistical analysis on their results and used Pearson correlation coefficients to describe the relations among the subscales and linear regression to examine associations between MEQ scores and demographic characteristics.

The psychometric properties of the MEQ were labeled as good. Each subscale had good internal consistency reliability ranging from 0.64 to 0.83. The reliability of the MEQ summary score was also good at 0.64. There were modest to moderate correlations among all subscales except for 0.03 correlation between External Cues and Emotional Response. The subscales for the final MEQ were consistent with the researchers' hypothesized domains but there were two exceptions. Affective sensitivity strongly overlapped the Awareness domain, and one domain of Awareness was made. The researchers also had two items from the External Eating subscale and the Distraction subscale load onto the Emotional Response factor. The researchers felt this was from a uniqueness of the study population versus a common behavioral response to emotional stress. In the end, the researchers found that mindful eating was associated with yoga practice and suggested that mindful eating is a learned skill (Framson et al, 2009). Permission from the Fred Hutchinson Cancer Research Center has been granted with certain limitations. (Appendix A).

In this research study, the Mindful Eating Score for each subscale was analyzed as well as the total score. There were five domains with possible scores ranging from 1-4 and a total score range of 1-4. Please see Table 1 for further explanation of the scoring.

Lifestyle Factors

Lifestyle factors included questions about smoking, alcohol use, and physical activity/inactivity habits with multiple choice answers. The smoking questions used were standard questions asked in most studies and suggested by the CDC (CDC, 2015c). The available responses to the question regarding current smoking status were: non- smoker or Never smoked (less than 100 cigarettes per lifetime), current smoker (any tobacco in the last month), former smoker (more than 100 cigarettes per lifetime). This data was analyzed and treated as a categorical variable with two groups, "smokers" and "nonsmokers". The alcohol use questions were derived from the CDC suggested definitions for moderate drinking (CDC, 2016). The answers were: nondrinker, following the CDC recommendations of one drink per day for women and two drinks per day for men, drink less than the CDC recommendations of one drink per day for women and two drinks per day for men, and drink more than the CDC recommendations of one drink per day for women and two drinks per day for men (CDC, 2016). The variable was treated as a categorical variable with two categories, "Doesn't drink or less than the CDC recommendations "or and "Drinks the same or more than the CDC recommendations".

Physical activity/inactivity questions were derived from the suggested physical activity for adults by the CDC (CDC, 2015b).

Which of the following describes your weekly physical activity routine?

- I perform at least 150 minutes of moderate-intensity aerobic activity (i.e., brisk walking) every week.

- I perform at least 75 minutes of vigorous-intensity aerobic activity (i.e., jogging or swimming) every week.
- I perform a mixture of moderate- and vigorous-intensity aerobic activity at least 75 minutes per week.
- I perform some low level aerobic activity weekly for at least 75- 150 minutes.
- I do not do any kind of aerobic activity.

The activity variable was treated as a categorical variable as well. The first three answers were considered "physically active per CDC guidelines", the fourth and fifth answers were considered as "physically active less than the CDC guidelines" (CDC, 2015b).

Health Related Quality of Life

The CDC has defined the HRQOL as "an individual or group's perceived physical/mental health over time" (CDC, 2000, p. 8). The instrument used was the CDC HRQOL-4 which includes the Healthy Days Core Module. The "Healthy Days" measures have been used since 1993 in the Behavioral Risk Factor Surveillance System (BRFSS) surveys which complete more than 400,000 adult interviews each year via telephone in all 50 states (CDC, 2016). This is used to track the overall progress in meeting Healthy People 2020 goals. In 2000, the "Healthy Days" measure was also added to the National Health and Nutrition Examination Survey (NHANES). The questionnaire contained four questions:

- Would you say that in general your health is? (Excellent, Very Good, Good, Fair, Poor).
- Now thinking about your physical health, which includes physical illness and injury, for how many days during the last 30 days was your physical health not good? (0-30).
- Now thinking about your mental health, which includes stress, depression, and problems with your emotions, for how many days during the past 30 days was your mental health not good? (0-30).
- During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation? (0-30) (CDC, 2000, 2011).

The "Healthy Days" questions are defined as "perceived physical and mental health over time" (Moriarty, Zack, & Kobau, 2003, p. 2.). The CDC (2000) lists the main advantages of using the "Healthy Days" measures and population data:

1. Relate directly to the Healthy People 2010 goals.
2. Reflect known demographic and socioeconomic disparities and health patterns.
3. Reflect the burden of physical and mental illness and disability.
4. Are validated against other established measures (e.g., MOS Short Form 36).
5. Predict short-term mortality and hospitalization.
6. Provide new insights into health behaviors.
7. Indicate important new policy-relevant disparities and trends.

8. Provide a focus for comprehensive community health programs.
9. Provide comparable population data from 1993 onward (nearly one million adults).
10. Are simple to measure, calculate, interpret, and add to other assessments.

Many studies have proven the reliability and validity of the HRQOL-4 (Diwan & Moriarty, 1995; Moriarty & Zack, 1999; Nanda & Andersen, 1998; Newschaffer, 1998). The greatest proof lies in its use in major health surveys conducted in the United States since 1993. This tool seemed the most appropriate for this study because it is short, easy to answer, and measures the last thirty days instead of just asking about one day. The scale uses scores with the "unhealthy days" index which is calculated by adding the physically and mentally unhealthy days with a maximum score of 30. The assumption is made that the physically and mentally unhealthy days minimally overlap. The CDC (2011, 2014), recommended SPSS syntax to code the last 3 out of 4 questions. The results were grouped into two categories, poor or fair HRQOL and good, very good, and excellent HRQOL which were treated as categorical variables. The data was analyzed using this recommendation but produced less than 1% of the poor or fair category. Therefore, I decided to use the sum of unhealthy days as a dichotomous with 0-13 days and 14 to 30 days categories. I used the sum of unhealthy days as a continuous variable along with the number of physically unhealthy days, the number of mentally unhealthy days, the number of days that poor physical or mental health affected daily activities, and the summary index of unhealthy days. The Healthy People 2020 reports data on the self-rated health and the total number of unhealthy days as well.

Data Analysis Plan

Data was analyzed using IBM SPSS Software. The demographic data was analyzed using frequency distributions such as central tendency with mode, median, and mean, variability, range, and standard deviations. Graphs were made to display the data visually.

The research questions and hypotheses for this study were:

RQ1: Is there an association between perceived job stress and the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States?

$H_0$1: Perceived job stress is not associated with the HRQOL (as measured by the summary index of unhealthy days) in a sample of registered nurses in the United States.

$H_1$1: Perceived job stress is associated with the HRQOL (as measured by the summary index of unhealthy days) in a sample of registered nurses in the United States.

The independent variable is perceived job stress which was used as an ordinal data since it uses a Likert scale. The dependent variable is HRQOL which was measured by the summary index of unhealthy days, physically unhealthy days, mentally unhealthy days, and days that poor health affected daily activities. This allowed for ordinal and continuous variables which enabled utilization of the Spearman's correlation test. Correlation is used when there are two variables to determine a relationship or association (Polit & Beck, 2014).

RQ2: Are there associations between BMI, alcohol use, tobacco use, and/or lack of physical activity and the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States?

$H_0$2: BMI, alcohol use, tobacco use and/or lack of physical activity are not associated with the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States.

$H_1$2: BMI, alcohol use, tobacco use, and/or lack of physical activity are associated with the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States.

Multiple IVs were used including the BMI which was treated as a ratio or continuous variable, alcohol use which was treated as a categorical variable with 2 levels; Less than CDC recommendations/nondrinker or CDC recommendations or more. Tobacco use was treated as a categorical variable with 2 levels; nonsmoker (which included the former smokers) and smoker (CDC, 2015c). The lack of physical activity was treated as a categorical variable with less than CDC recommendations and no physical activity considered as "the lack of physical activity" or "physical inactivity" (CDC, 2015b). The DV was taken from the HRQOL-4 and measured using the summary index of unhealthy days (CDC, 2000, 2011). Binomial logistic regression was used because the multiple independent variables and the dependent variables are either continuous or dichotomous variables. Logistic regression "analyzes the relationships between multiple independent variables and a nominal-level outcome" (Polit & Beck, 2014, p. 240). According to Laerd (2016), there are seven assumptions that are made to use this statistical test:

1. There is a dichotomous dependent variable; there are two or more independent variables, which can be either continuous variables (i.e., an interval or ratio variable) or nominal variables.
2. There should be independence of observations.
3. The categories of the dichotomous dependent variable and all the nominal independent variables should be mutually exclusive and exhaustive.
4. There should be a bare minimum of 15 cases per independent variable (although some recommend as high as 50 cases per independent variable).
5. There needs to be a linear relationship between the continuous independent variables and the logit transformation of the dependent variable. I used the Binary Logistic procedure in SPSS to test this assumption.
6. The data must not show multicollinearity. Multicollinearity is when you have two or more independent variables that are highly correlated with each other. I tested for this by inspecting the correlation coefficients and Tolerance/VIF values.
7. There should be no significant outliers, high leverage points or highly influential points. SPSS Statistics can detect possible outliers, high leverage points and highly influential points when running the binomial logistic regression on the data (Laerd, 2015a, p. 5).

The binomial logistic regression could determine "which of the individual variables (if any) have a statistical significant effect on the dependent variable as well as determine how well the binomial logistic regression model predicted the dependent variable"

(Laerd, 2015a, p. 5). There are different procedures to binomial logistic regression that were done, such as determining how fit the model is using the Hosmer and Lemeshow goodness of fit. The Nagelkerke R squared was used to determine how much variation in the dependent variable can be explained by the model (Laerd, 2015a, p. 9). The end results are calculated as an x-squared value, a *p* value, a Nagelkerke R squared value, a sensitivity percentage, a specificity percentage, a positive predictor value, a negative predictor value and an odds ratio. The estimated probability of the independent variable predicting the dependent variable has a high probability if the *p* is greater than or equal to 0.5. The estimated probability of not predicting would be a *p* value of less than 0.5.

RQ3: Is there an association between the MEQ score and the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States?

$H_0$3: The MEQ score is not associated with the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States.

$H_1$3: the MEQ score is associated with the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States.

The independent variable was the mindful eating summary score which was measured using the MEQ with a score from 1-4. Four was considered the highest mindful eating score and 1 was the lowest score. This score was treated as an ordinal variable. The five domains of the MEQ were also analyzed with 4 being the highest score and 1 the lowest and reported as a frequency. The dependent variable was taken from the HRQOL-4, the summary index of unhealthy days which was treated as a continuous

variable but also further delineated into the number of physically unhealthy days, mentally unhealthy days, and the number of days poor health affected their daily activities. I used the Spearman's Correlation for this research question. The Spearman's Correlation measures the strength and direction of the association between two continuous, two ordinal or one ordinal and one continuous (Laerd, 2015b). There are 3 assumptions that needed to be met before the test could be performed. The first assumption was that the variable combination had to be correct. The second assumption was that the data was paired observation which was attained by choosing the option of "exclude cases pairwise" which does not accept data unless the variables are paired up, leaving out missing data. The last assumption was that there was a linear relationship between the MEQ scores and the number of unhealthy days which was visually seen on a scatterplot (Laerd, 2015b). The Spearman correlation test produced a coefficient correlation or a rho, a p value to evaluate the significance and the direction of the relationship. There was a correlation if r□ was between +1 and -1 with 0 meaning no linear relationship. The strength is weak to strong and can be positive or negative. The p value had to be less than 0.05 for the relationship to be statistically significant.

Threats to Validity

External Validity

Threats to external validity included the fact that I was using a convenience sample linked with a professional association and social media groups and therefore the results could not be universally applied to all RNs in the United States. I also omitted the demographic question of what state the participant was from accidentally. It would have

been interesting to know where the participants were from. If I could have gathered more surveys to reach the needed sample size of 588, then the results would have had more power. According to Polit & Beck, the statistical power will allow for more participants and should be more representative with higher statistical power (Polit & Beck, 2014). The e-newsletter seemed to be a way to reach many nurses but according to the company, their response of opening the email was only 27-32%. This decreased the response rate.

Internal Validity

In this study, there were threats to the internal validity. There was a temporal ambiguity threat because there was no way to prove whether job stress came before or after the BMI, the mindful eating score, the tobacco use, or other variables. A person who has not been on a job long enough may not have perceived job stress. A younger person may have less personal stressors and more social networks than an older person. An older person may have more chronic illness presence that could affect their health-related quality of life.

Construct Validity

This is the degree to which the constructs were truly representative of themselves. The construct validity of the perceived job stress question has been used in the Mark and Smith (2008) study. The BMI is considered a strong construct in screening for obesity (CDC, 2015a). The psychometric properties of the MEQ were labeled as good. Each subscale had good internal consistency reliability ranging from 0.64 to 0.83 (Framson et al., 2009). The reliability of the MEQ summary score was also good at 0.64 (Framson et

al., 2009). CDC's HRQOL-4 has been studied over time and has been used in national surveys yearly (CDC, 2000, 2011).

Ethical Procedures

I obtained permission from Walden University's IRB after the proposal was approved. The approval number was 01-18-17-0158838. There were no ethical concerns identified in the recruitment of participants. The survey was completely anonymous since SurveyMonkey's privacy settings were set as such. The participants had the right to stop the survey at any time. There were 103 surveys collected and the demographic information was analyzed. I only used 95 completed surveys for testing of the hypotheses. The MEQ is based on means therefore, if the participant skipped a question, the Mindful Eating summary score could still be calculated. The collected data was stored in SurveyMonkey in which only I have access to with a personal user name and password. The surveys were printed out for convenience and kept in locked desk drawer in my office. At the end of the research, the print outs were disposed of in a sensitive information bin located at my place of employment. The collected data did not include any identifying information and there was no way that the participants could be contacted since the survey was anonymous. The data was downloaded and stored on a thumb drive for the next 5 years. After 5 years, the memory on the thumb drive will be deleted. I will not keep the SurveyMonkey account after the dissertation is finished due to the cost of 300 dollars per year for membership

The study had the potential to include participants from across the country. Some of the participants did know me on the social media site LinkedIn and did take the

survey. Since it was anonymous, there was no way to determine the participant from the survey answers. There were no identified conflicts of interest. There were no financial incentives offered due to the large number of possible participants.

Summary

Chapter 3 described the methodology for this research. This research was a quantitative survey design that provided more information on how nurses' job stress can affect their health-related quality of life. This study also examined the health-related behaviors of nurses including smoking, alcohol use, eating behaviors, and physical inactivity. Most of the surveys used on health behaviors focused on how many fruits and vegetables are eaten. This survey examined the eating behavior of nurses and how job stress affected this. The participants were not diverse in gender or ethnicity. Most of the studies done on American nurses have been predominantly White (Wang et al., 2013) which was the same in this study.

The population and selection were discussed as well as how the survey was made available to the participants. The variables were identified and defined. The tools used in this study, such as the MEQ and the HRQOL-4 were described and shown to be reliable and valid in other studies. Other variables including tobacco use, alcohol use, and physical inactivity were all defined by CDC's defined standards. The statistical approach was identified and explained throughout Chapter 3. In Chapter 4, the results and analysis of the data were discussed.

Chapter 4: Results

Introduction

Nursing is a stressful profession and nurses who are affected by stress may choose unhealthy behaviors that can also affect their health-related quality of life, particularly in terms of physically and mentally unhealthy days per month. The purpose of this quantitative study was to determine to what extent work demands, measured by perceived job stress, affected the HRQOL (number of unhealthy days) of registered nurses in the United States. This study also investigated to what extent other variables such as BMI and certain lifestyle behaviors affected the HRQOL (number of unhealthy days) as well. The independent variables were perceived job stress, weight (BMI), and lifestyle factors such as tobacco and alcohol (ETOH) use, physical activity, and mindful eating, and the dependent variable was the HRQOL (measured by the summary index of unhealthy days) of the RNs. Other demographic variables were also analyzed to determine whether there were any other significant relationships can be identified.

In this chapter, I discuss the data collection and descriptive demographics of the study population as well as the results of the statistical analysis.

Data Collection

The survey was deployed using the SurveyMonkey design platform. Initially the advertising manager at the NPACE group was contacted to purchase an advertisement in their newsletter. The cost was $700.00 for an advertisement spot in their new e-newsletter that was sent out to 47,844 members on February 7, 2017 and to 47,904 members for the Feb 21, 2017, ad. The advertisement included an invitation to participate in the survey if

the person met the study inclusion criteria. To participate in the survey, the nurse had to place the SurveyMonkey link into their internet browser and respond to the survey questions. The first page of the survey included the participant information sheet that offered background information about the study, how to complete the survey, examples of the survey questions, risks, benefits, privacy concerns, and whom to contact with questions. If they wished to participate, the nurses proceeded to the survey. Another survey link was posted on LinkedIn and in various nursing groups on LinkedIn as an alternative way to collect more data. It was difficult to determine from which site data came, but out of 103 surveys returned, 45 were returned before the NPACE advertisement. After the first NPACE advertisement, there were 52 returns that were combined from NPACE members as well as social media participants. After sending another updated post in social media on February 28, 2017, 20 were received, but again, I was unable to determine whether surveys were from NPACE participants or the social media sites. Participants 5, 8, 9, 51, 56, 85, 91 and 92 were deleted from data analysis of the variables due to incomplete surveys. The final number of participants was 95. In the MEQ, the questionnaire was scored with the mean of answered questions; therefore, it did not affect the results if a participant missed or skipped a question. Some participants started filling out demographic information and then did not finish any other part of the survey. The eight participants described above were omitted. The data collection occurred from December 17, 2016, until March 13, 2017. Unfortunately, this only yielded 95 completed surveys for hypotheses testing despite the survey being opened for a longer duration of three months instead of the 1 month that was in the original plan.

When the participant completed the survey, there was a thank you note for participating in the survey. My university e-mail was also listed in the beginning if there were any concerns or questions. I did not receive any e-mails from any of the participants.

Demographics of the Sample

In Table 2, the race/ethnicity, gender, and age data are displayed. Approximately 92% of this sample of RNs in the United States were White/Caucasian, 3% Black /African American, 2% multiple ethnicities, 2% Hispanic, and 1% Asian/Pacific Islander. Approximately, 27% of this sample were 50-59 years old with 74% over the age of 40 and 92% female.

Table 2

Race/Ethnicity, Age, & Gender of RNs N = *95*

				Age				
				21-29	30-39	40-49	50-59	60 or older
				Count	Count	Count	Count	Count
Race/Ethnicity	Multiple ethnicity / Other	**Gender**	Male	**0**	**0**	**0**	**0**	**0**
			Female	**0**	**0**	**1**	**1**	**0**
	American Indian or Alaskan Native	**Gender**	Male	**0**	**0**	**0**	**0**	**0**
			Female	**0**	**0**	**0**	**0**	**0**
	Asian / Pacific Islander	**Gender**	Male	**0**	**0**	**0**	**0**	**0**
			Female	**0**	**0**	**0**	**0**	**1**
	Black or African American	**Gender**	Male	**0**	**0**	**0**	**0**	**0**
			Female	**0**	**1**	**0**	**1**	**1**
	Hispanic	**Gender**	Male	**0**	**0**	**0**	**0**	**0**
			Female	**0**	**0**	**1**	**1**	**0**
	White / Caucasian	**Gender**	Male	**0**	**0**	**0**	**3**	**2**
			Female	**12**	**11**	**22**	**20**	**17**

Table 3 shows that approximately 51% of RNs in this sample had more than 20 years of experience, and 55% of the RNs had a graduate degree. Interestingly, almost 10% had their doctorate degree. All the participants were RNs, with approximately 58% having RN as their highest licensure and approximately 38% with advanced nursing licensure, which can be explained by the NPACE advertisement that was geared towards nurse practitioners.

Table 3

Experience, Education, & Gender of RNs N = 95

		Experience as RN				
		0-5 years	6-10 years	11-15 years	16-20 years	more than 20 years
		Count	Count	Count	Count	Count
Education	Diploma degree	**0**	**0**	**0**	**0**	**2**
	Associate degree	**0**	**1**	**0**	**0**	**1**
	Bachelor degree	**11**	**6**	**6**	**2**	**5**
	Graduate degree i.e. Master's Degree	**1**	**11**	**5**	**3**	**32**
	Doctorate degree i.e. PhD or DNP	**0**	**0**	**0**	**0**	**9**
	Other (please specify)	**0**	**1**	**0**	**0**	**3**
Licensure	RN	**12**	**12**	**9**	**3**	**19**
	Advanced Practice RN: Nurse Practitioner	**0**	**5**	**2**	**1**	**23**
	Advanced Practice RN: Nurse Midwife	**0**	**0**	**0**	**0**	**0**
	Advanced Practice RN: Nurse Anesthetist	**0**	**0**	**0**	**0**	**0**
	Advanced Practice RN: Clinical Nurse Specialist	**0**	**0**	**0**	**1**	**4**

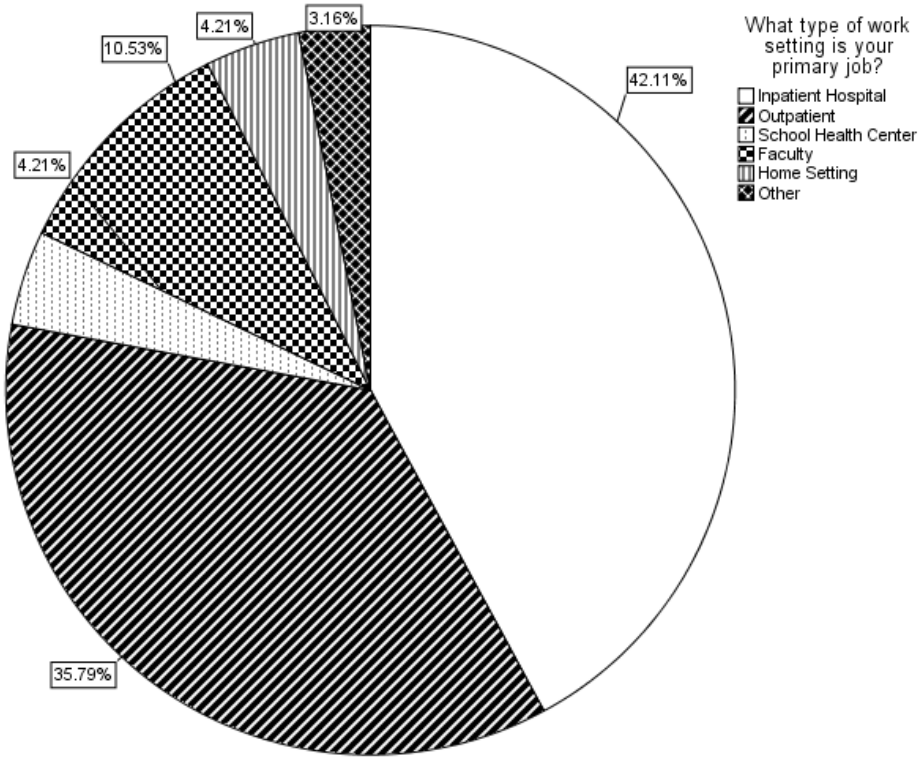

Figure 2. Primary work setting of RNs. $N = 95$.

Figure 2 shows how RNs in this sample described their primary work settings. Approximately 42% worked in an inpatient setting and 36% in an outpatient setting. The "Other" category included occupational health, medical writer, independent practice, and testing centers.

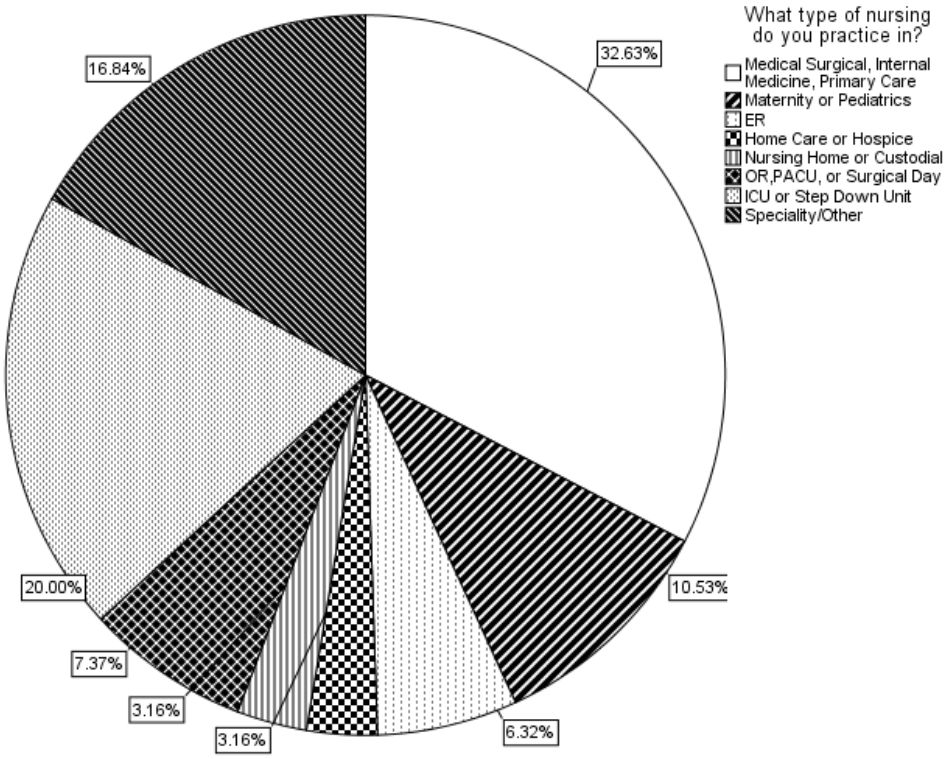

Figure 3. Primary area of nursing of RNs. $N = 95$.

Figure 3 shows how the sample of RNs described what type of nursing area they worked in. Approximately, 33% worked in medical surgical, internal medicine, or primary care and 17% in specialty/other areas. The "other" category included utilization review, case management, occupational health, psychiatry, and wound center. Approximately, 65% of the RNs in this sample worked full time and approximately 73% worked the day shift. Only 29% reported they worked more than one job.

Variables

In Figure 4, BMI was used as a continuous variable and a histogram shows the mean BMI of 93 RNs as 27.635. Unfortunately, two participants did not report their height and weight.

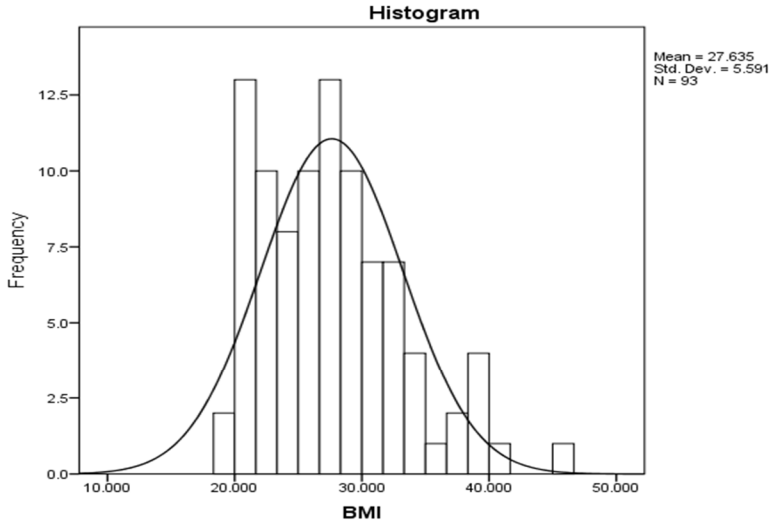

Figure 4. Mean BMI of RNs.

BMI was also used as a categorical group. In Figure 5, the BMI groups show that while approximately 31% were of normal weight, 59% were overweight, obese, or morbidly obese. Out of the 95 participants, two did not respond to this question.

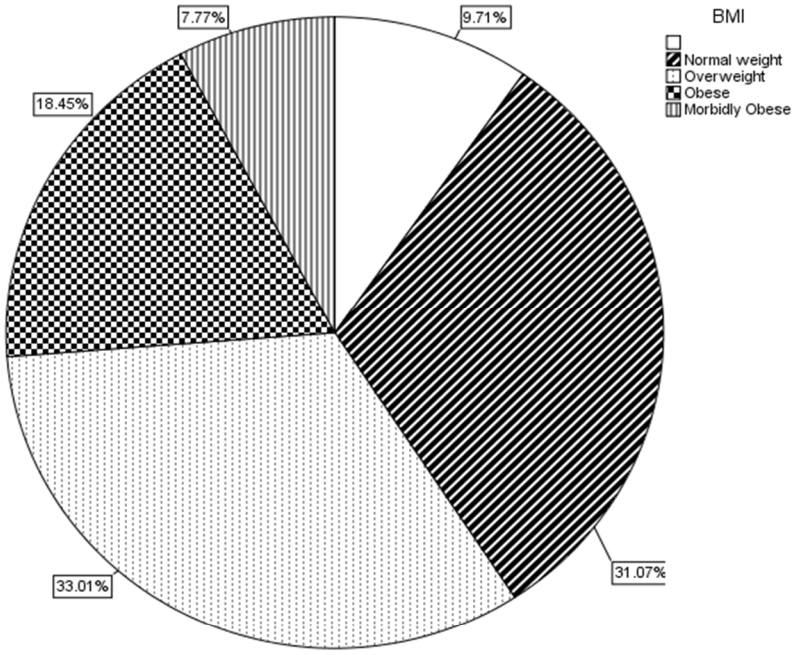

Figure 5. BMI of RNs categorically.

Perceived job stress was measured with a Likert scale. Figure 6 shows that less than 1% had no perceived job stress, and most RNs had moderate perceived job stress (47%).

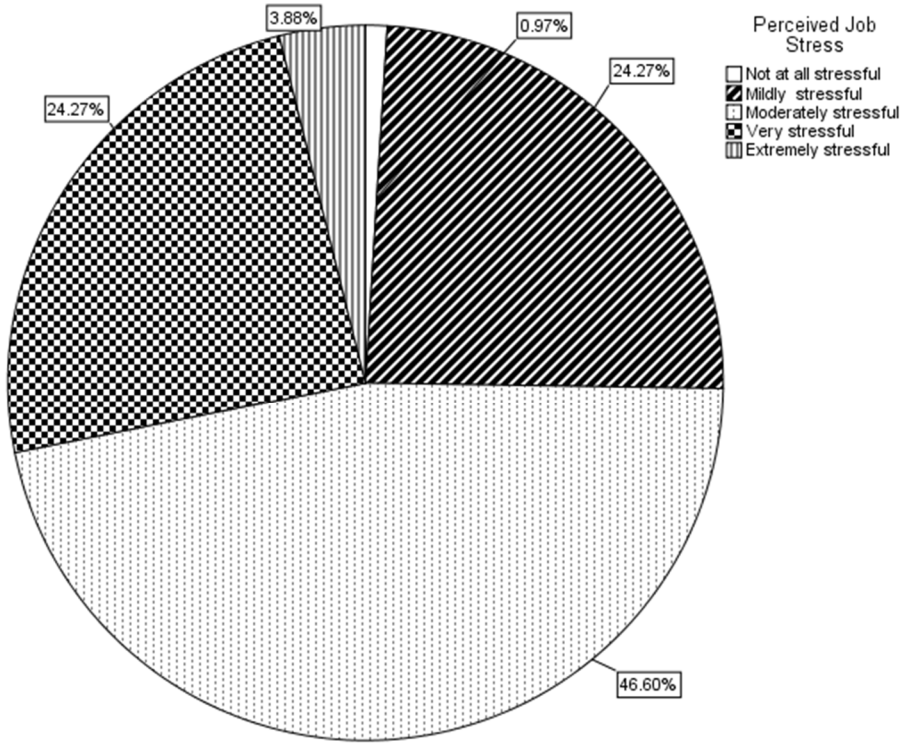

Figure 6. Perceived job stress of RNs.

Current smoking status was divided into two groups, those who were a former or nonsmoker and those currently smoking. Approximately 4% currently smoked ($N = 95$). Alcohol use was viewed as a dichotomous variable group with those who were nondrinkers or drank less than the CDC recommendations and those who drank alcohol at or above the CDC recommendations. Approximately 70% were nondrinkers or drank less than the CDC recommendations ($N = 95$). Activity was also used as a dichotomous

variable with one group participating in physical activity according to the CDC recommendations and another group that exercised less than the CDC recommendations or did not exercise. Approximately 76% of the sample of RNs exercised less than CDC recommendations or did not exercise at all on a weekly basis ($N = 94$).

Mindful eating was measured by the MEQ. The summary score was calculated per the questionnaire's guidelines. In Figure 7, a histogram displays the mean score of 2.79 for the summary score of the MEQ. The score is from 1-4 with 4 being the highest mindfulness. The means for the 5 domains were as follows: Awareness (2.70), Distraction (2.77), Disinhibition (3.03), Emotional (2.94), and External Cues (2.57). The highest domain mean was disinhibition which indicated that the RNs were more mindfully aware in this area. The lowest domain mean was External Cues which indicated that the RNs were less mindfully aware in this area.

The presence of chronic illness was also explored. Approximately 38% of the sample of RNs reported no chronic illnesses versus 62% had at least one chronic disease. Most reported depression (23%) and anxiety (23%).

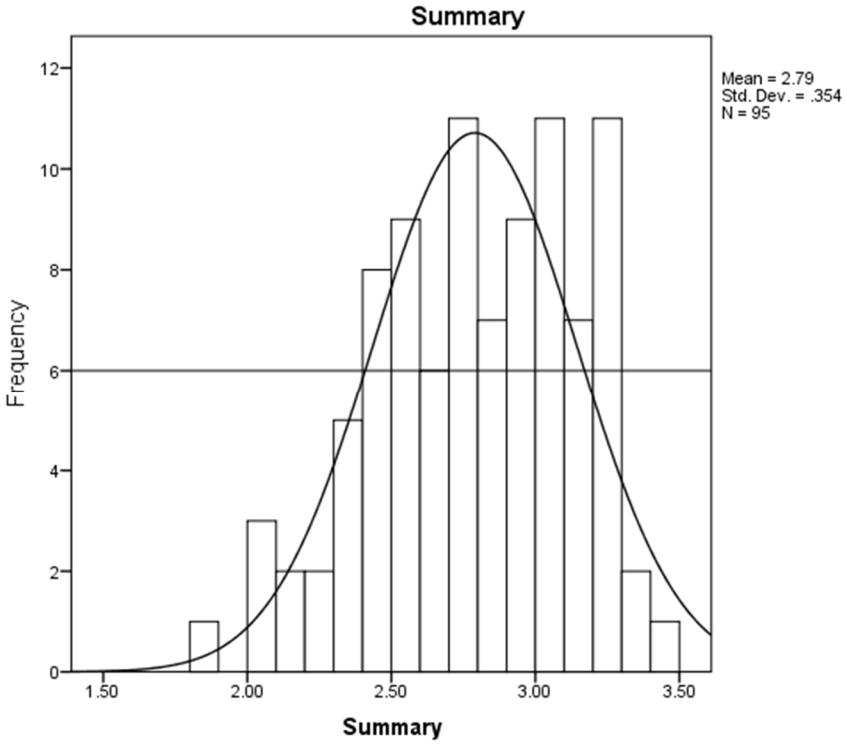

Figure 7. Mean summary scores of MEQ of RNs.

Self-rated health categories were Excellent, Very Good, Good, Fair, and Poor. In Figure 8, approximately 92% of RNs had Excellent, Very Good, or Good self-rated health with only 8% Fair or Poor.

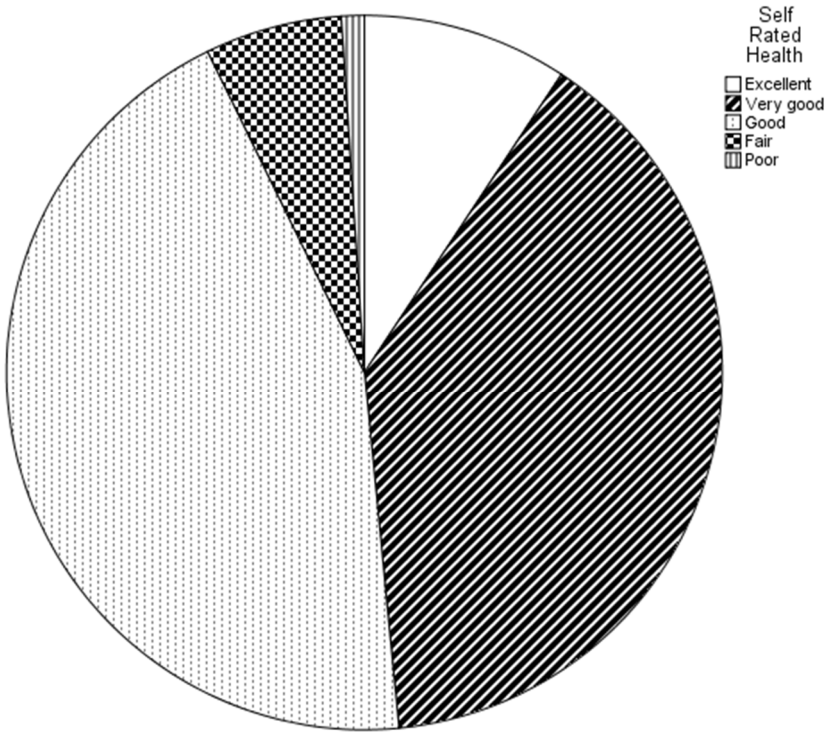

Figure 8. Self-rated health of RNs.

The number of health-related quality of life (HRQOL) was measured by the number of unhealthy days as a dichotomous and continuous variable. In Figure 9, the HRQOL is displayed as better HRQOL with less unhealthy days and less HRQOL with more unhealthy days. In this sample of RNs, approximately 66% had less unhealthy days (better HRQOL) versus 34% had more unhealthy days (less HRQOL).

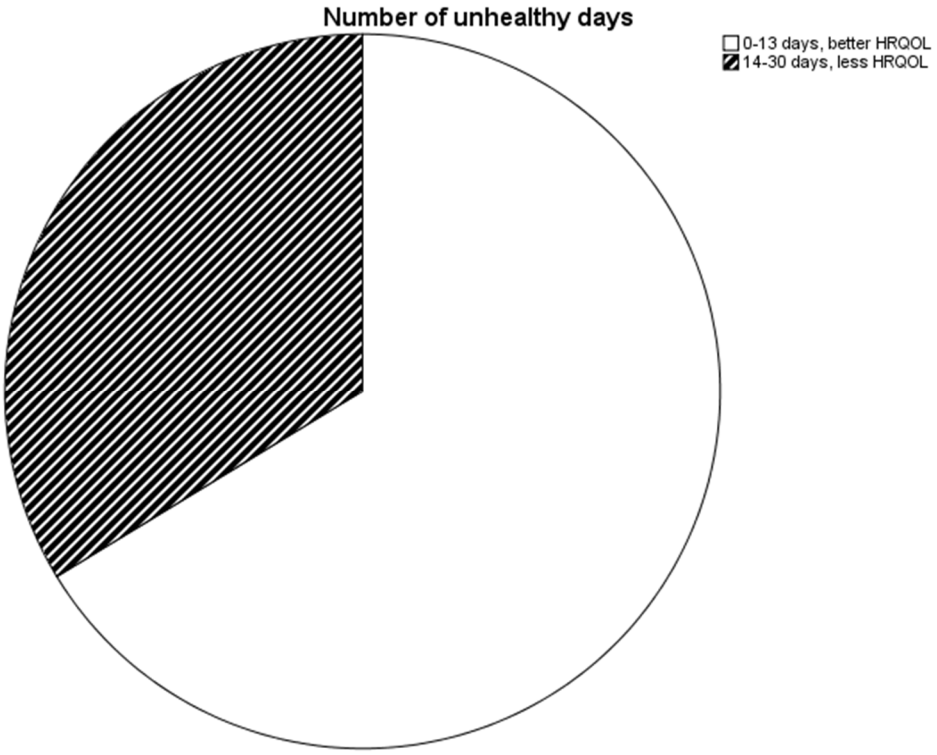

Figure 9. The number of unhealthy days reported by RNs.

The research questions and hypotheses for this study were:

RQ1: Is there an association between perceived job stress and the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States?

$H_0$1: Perceived job stress is not associated with the HRQOL (as measured by the summary index of unhealthy days) in a sample of registered nurses in the United States.

$H_1$1: Perceived job stress is associated with the HRQOL (as measured by the summary index of unhealthy days) in a sample of registered nurses in the United States.

The statistical test used to answer RQ1 was the Spearman's correlation. This test had three assumptions. The first assumption was that the variables used must include either two continuous variables, two ordinal variables, or one ordinal and one continuous variable. Perceived stress used a Likert scale and was used as an ordinal variable. The HRQOL was measured by the number of physically unhealthy days, the number of mentally unhealthy days, the sum of both days, and the number of days that poor physical or mental health kept the person from their activities. These were all continuous variables 0-30. The second assumption was that there were paired observations. Ninety-five surveys were complete and analyzed. The third assumption was that there was a monotonic relationship visualized in a scatterplot. Since I had a low sample size, the scatterplot was not ideal but did show an increase of both variables and therefore was monotonic.

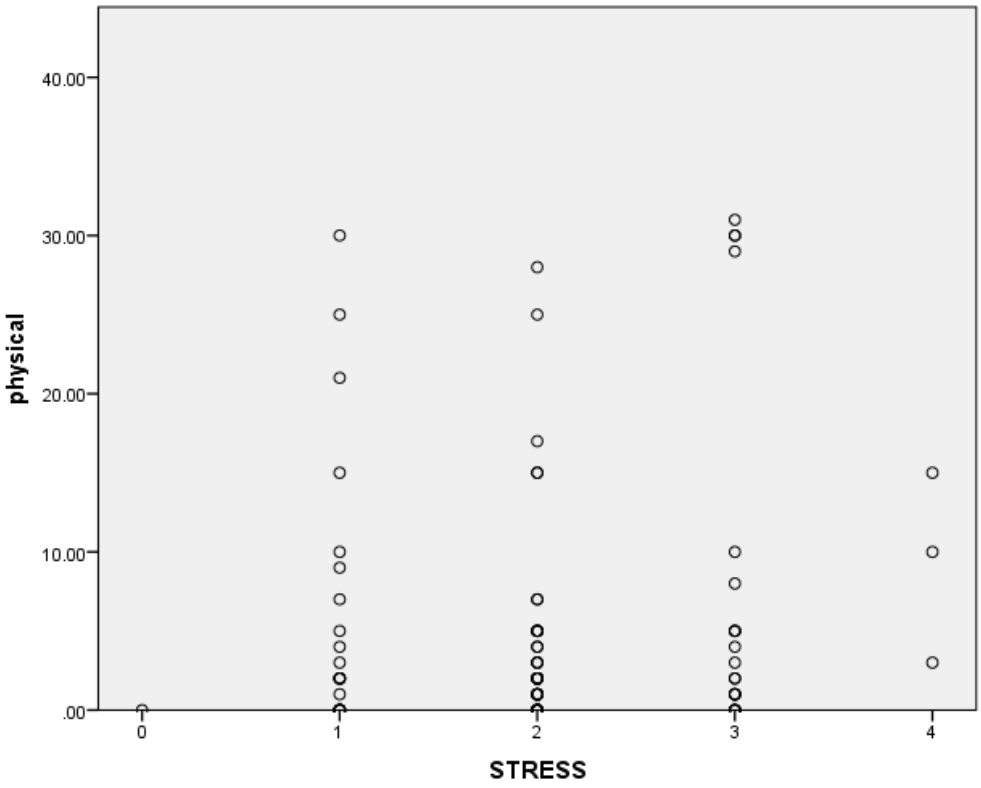

Figure 10. Scatterplot with perceived job stress and number of Physically unhealthy days.

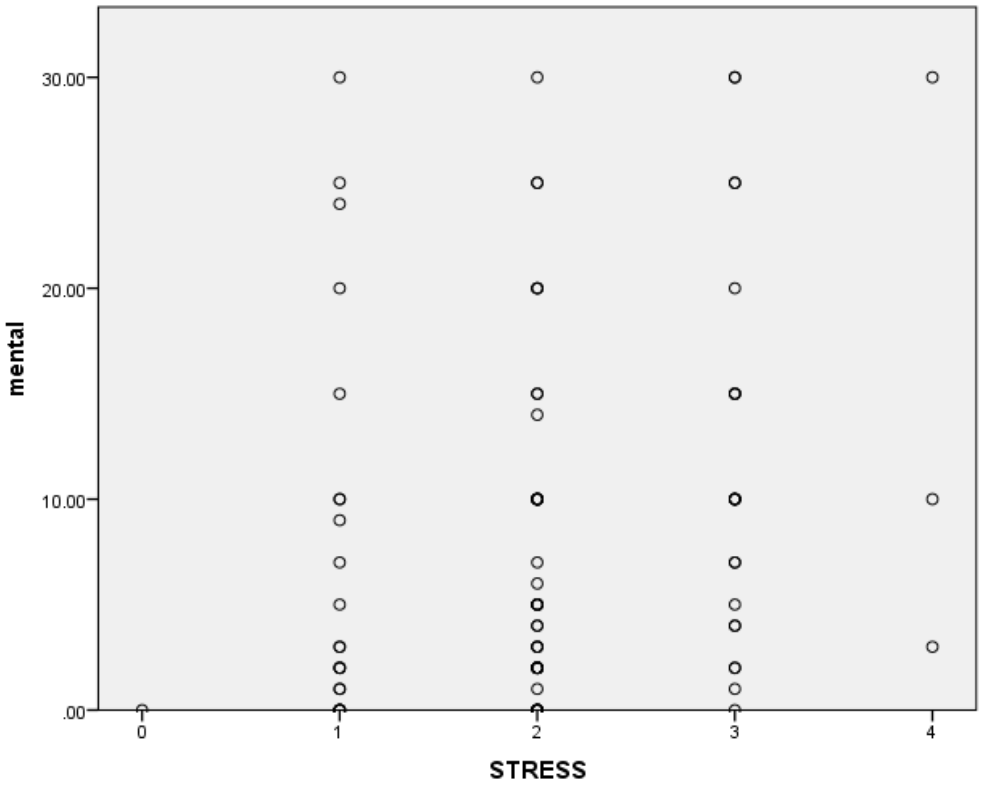

Figure 11. Scatterplot of perceived job stress and number of mentally unhealthy days.

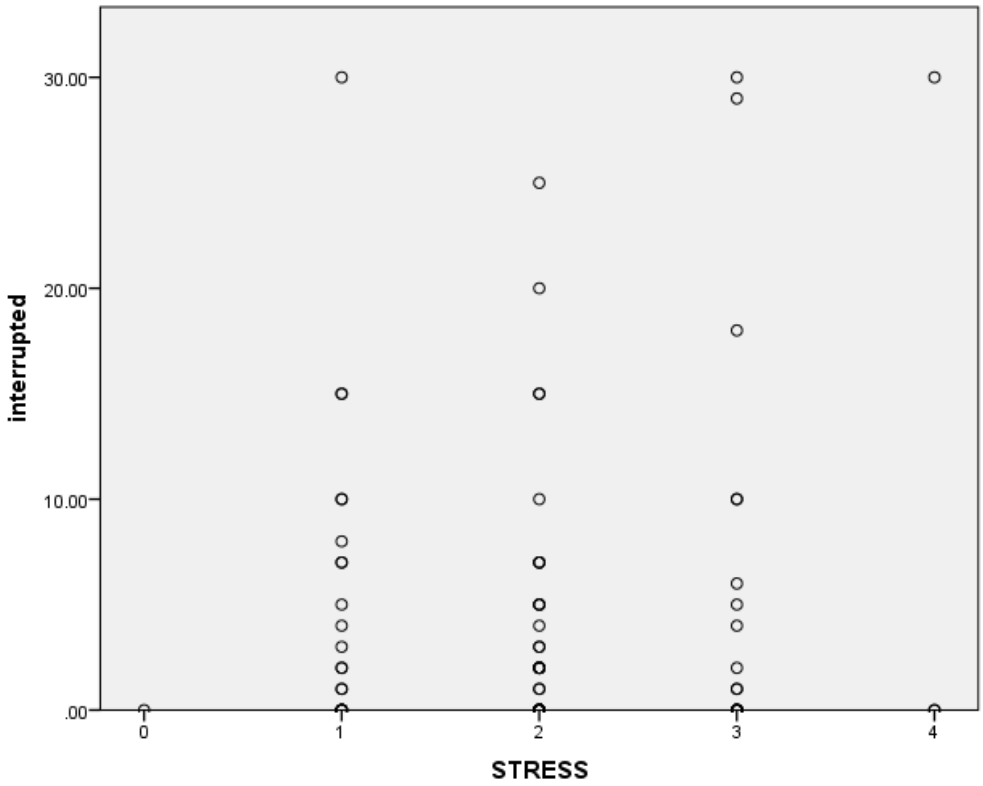

Figure 12. Scatterplot of perceived job stress and number of days kept from daily activities.

A Spearman's rank-order correlation was run to assess the relationship between perceived job stress and HRQOL which was measured by the number of physically unhealthy days, mentally unhealthy days, number of days that poor physical or mental health interfered with daily activities, and the sum of the physically and mentally unhealthy days with a maximum of 30 days in a sample of nurses from the United States. Preliminary analysis showed the relationship to be monotonic, as assessed by visual inspection of a scatterplot. The alpha level used was 5% for all statistical analysis. Perceived job stress demonstrated a weak positive correlation with the number of mentally unhealthy days ($\rho = .275$, $p < .05$). Perceived job stress also had a weak correlation to the sum of the unhealthy physically and mentally unhealthy days which had

to be 30 or less, (ρ = .203, $p < .05$). Therefore, I rejected the null hypothesis and accepted the alternative hypothesis. I used caution not to interpret this as a causal relationship since the sample was random and there was a low sample size. Spearman's sample size for 2 tailed 0.80 power, with expected correlation coefficient of 0.2 would be 194, 0.3 would be sample size of 85 and for 0.5 would be 29 participants (Hulley et al. (2013).

A Spearman's correlation was also run on other variables to investigate any associations. There was also a weak correlation between the number of physically unhealthy days and the number of mentally unhealthy days (physically unhealthy days, ρ = .266, $p< .05$). There was also a weak correlation between the number of physically unhealthy days and number of days kept from usual activities due to poor physical or mental health (interrupted), (ρ = .218, $p < .05$) but the number of mentally unhealthy days had a moderate correlation with the interrupted days, (ρ = .387, p<.05). The number of physically unhealthy days also moderately correlated with the sum of unhealthy days (physically and mentally), (ρ = .445, $p < .05$) but the number of mentally unhealthy days correlated strongly with the sum of unhealthy days, (ρ = .742, $p < 0.05$). The alpha level used was 5%.

Table 4

Spearman's Correlation of Perceived Job Stress, Unhealthy Days, BMI &MEQ

			stress	physical	mental	interrupted	BMI	MEQ	Sum of Total Unhealthy Days
Spearman's rhoc	**STRESS**	Correlation Coefficient	1.000	.128	.275**	-.068	.006	-.159	.203*

(*table continues*)

			stress	physical	mental	interrupted	BMI	MEQ	Sum of Total Unhealthy Days
Spearman's rhoc	**STRESS**	Sig. (2-tailed)	.	.216	.007	.513	.957	.124	.049
		N	95	95	95	95	93	95	95
	physical	Correlation Coefficient	.128	1.000	.266**	.218*	.176	-.048	.445**
		Sig. (2-tailed)	.216	.	.009	.034	.091	.646	.000
		N	95	95	95	95	93	95	95
	mental	Correlation Coefficient	.275**	.266**	1.000	.387**	.041	-.261*	.742**
		Sig. (2-tailed)	.007	.009	.	.000	.696	.011	.000
		N	95	95	95	95	93	95	95
	interrupted	Correlation Coefficient	-.068	.218*	.387**	1.000	.134	-.277**	.431**
		Sig. (2-tailed)	.513	.034	.000	.	.201	.007	.000
		N	95	95	95	95	93	95	95
	BMI	Correlation Coefficient	.006	.176	.041	.134	1.000	-.388**	-.021
		Sig. (2-tailed)	.957	.091	.696	.201	.	.000	.841
		N	93	93	93	93	93	93	93
	MEQ	Correlation Coefficient	-.159	-.048	-.261*	-.277**	-.388**	1.000	-.184
		Sig. (2-tailed)	.124	.646	.011	.007	.000	.	.073
		N	95	95	95	95	93	95	95
	Sum of Physical and Mental Days	Correlation Coefficient	.203*	.445**	.742**	.431**	-.021	-.184	1.000
		Sig. (2-tailed)	.049	.000	.000	.000	.841	.073	.
		N	95	95	95	95	93	95	95

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 5

Crosstabulation of Perceived Job Stress and Education

		not stressful	mildly stressful	moderately stressful	very stressful	extremely stressful	
Education	Diploma	0	1	1	0	0	2
	Associate	0	0	0	2	0	2
	Bachelor	0	7	16	4	3	30
	Graduate	1	10	27	1	0	52
	Doctorate	0	5	2	2	0	9
Total		1	23	46	22	3	95

In figure 13, the perceived job stress was displayed with the number of unhealthy days. The group with less unhealthy days (0-13) had similar stress patterns as the other group with more unhealthy days (14-30). The small percentage of nurses who perceived their job as not stressful were in the better HRQOL category. Also, there were more "extremely stressful" answers in the lesser HRQOL category.

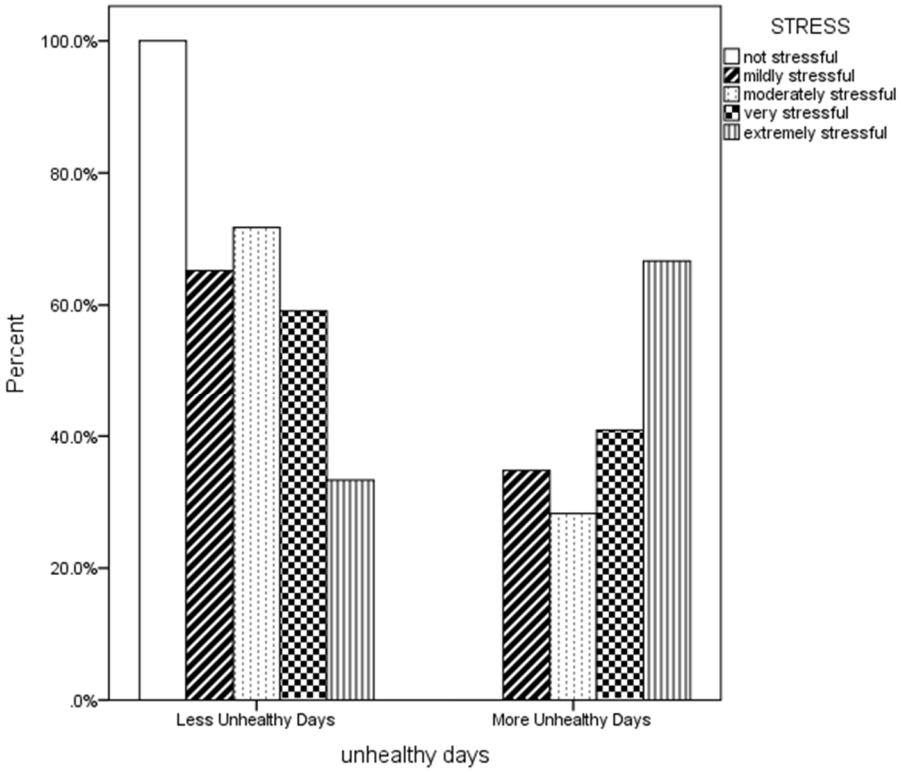

Figure 13. Perceived job stress and number of unhealthy days.

RQ2: Are there associations between BMI, alcohol use, tobacco use, and/or lack of physical activity and the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States?

$H_0$2: BMI, alcohol use, tobacco use and/or lack of physical activity are not associated with the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States.

$H_1$2: BMI, alcohol use, tobacco use, and/or lack of physical activity are associated with the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States.

The statistical testing used to answer this research question was binomial logistic regression because there are more than two independent variables and the dependent variable is a dichotomous variable. The independent variables were BMI (continuous). Logistic regression "analyzes the relationships between multiple independent variables and a nominal-level outcome" (Polit & Beck, 2014, p. 240). According to Laerd (2016), there are seven assumptions that are necessary to use this statistical test:

1. There is a dichotomous dependent variable; there are two or more independent variables, which can be either continuous variables (i.e., an interval or ratio variable) or nominal variables. In this study, BMI, smoking, alcohol use, and activity were all continuous or nominal variables. The HRQOL (measured by the summary index of unhealthy days) was treated as a dichotomous variable.
2. There should be independence of observations. This means that the variables did not overlap each other.
3. The categories of the dichotomous dependent variable and all the nominal independent variables should be mutually exclusive and exhaustive.
4. There should be a bare minimum of 15 cases per independent variable (although some recommend as high as 50 cases per independent variable). This study has four independent variables and there are more than 60 cases.
5. There must be a linear relationship between the continuous independent variables and the logit transformation of the dependent variable. I used the binary logistic procedure in SPSS to test this assumption. The only continuous independent variable was the BMI and a Box-Tidwell test was conducted

which showed linearity. Linearity of the continuous variables with respect to the logit of the dependent variable was assessed via the Box-Tidwell (1962) procedure. A Bonferroni correction was applied using all seven terms in the model resulting in statistical significance being accepted when $p < .007143$ (Tabachnick & Fidell, 2007). Based on this assessment, all continuous independent variables were found to be linearly related to the logit of the dependent variable.

6. The data must not show multicollinearity. Multicollinearity is a term used when 2 or more independent variables are highly correlated with each other. I detected for this by inspecting the correlation coefficients and Tolerance/VIF values. Multicollinearity was ruled out because none of the independent variables had correlations greater than 0.7 shown in Table 4.
7. There should be no significant outliers, high leverage points or highly influential points. SPSS Statistics can detect possible outliers, high leverage points and highly influential points when running the binomial logistic regression on the data (Laerd, 2015a, p. 5). There was no case wise list produced in the output therefore there are no significant outliers in the data.

Table 6

Binary Logistic Regression of Smoking, Alcohol, Activity, and BMI

		B	S.E.	Wald	df	Sig.	
Step 1[a]	Smoking(1)	-.394	1.462	.073	1	.788	
	Alcohol(1)	.243	.504	.232	1	.630	
	Activity			.625	2	.732	
	Activity(1)	-22.114	40193.351	.000	1	1.000	
	Activity(2)	-21.758	40193.351	.000	1	1.000	
	BMI by In_BMI	.001	.009	.014	1	.907	
	Constant	21.515	40193.351	.000	1	1.000	22

a. Variable(s) entered on step 1: Smoking, Alcohol, Activity, BMI * In_BMI .

Table 7

Coefficient Correlations of Activity, Alcohol, Smoking and BMI

Model			ACTIVITY	ALCOHOL	SMOKING	BMI
1	Correlations	ACTIVITY	1.000	.109	-.105	-.208
		ALCOHOL	.109	1.000	-.091	-.034
		SMOKING	-.105	-.091	1.000	-.119
		BMI	-.208	-.034	-.119	1.000
	Covariances	ACTIVITY	.011	.001	-.004	.000
		ALCOHOL	.001	.014	-.004	-3.784E-005
		SMOKING	-.004	-.004	.130	.000
		BMI	.000	-3.784E-005	.000	8.910E-005

a. Dependent Variable: numsumdays

Collinearity was also ruled out because the tolerance was above 0.1 in Table 8.

Table 8

Unstandardized and Standardized Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.669	.261		2.568	.012		
	SMOKING	-.099	.361	-.029	-.274	.785	.961	1.040
	ALCOHOL	.055	.118	.049	.466	.642	.981	1.019
	BMI	.000	.009	-.005	-.044	.965	.936	1.068
	ACTIVITY	-.084	.107	-.086	-.788	.433	.931	1.074

A binomial logistic regression was an appropriate test since it could determine "which of the individual variables (if any) have a statistical significant effect on the dependent variable as well as determine how well the binomial logistic regression model predicted the dependent variable" (Laerd, 2015a, p. 5). In this research study, a binomial logistic regression was performed to ascertain the effects of smoking, alcohol, inactivity, and BMI on the HRQOL (summary index of unhealthy days). The model fit was overall not statistically significant with (p = 0.250 which is greater than 0.05), however, the model was also tested with the Hosmer and Lemeshow goodness of fit which showed (p = 0.522) meaning it was not a poor fit. In this case, the p value had to be greater than 0.05. This is demonstrated in the Tables 9 and 10.

Table 9

Model Fitness

		Chi-square	df	Sig.
	Step	9.039	7	.250
Step 1	Block	9.039	7	.250
	Model	9.039	7	.250

Table 10

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	7.138	8	.522

The model explained 12.8% (Nagelkerke R^2) of the variance in the HRQOL (summary index of unhealthy days) and correctly classified 74.5% of cases. Sensitivity was 41.9%% and specificity was 90.5%%. The positive predictive value was 66.5% which meant that all cases that were predicted to have better HRQOL were correctly predicted 66.5% of the time. The negative predictive value was 64.6% which meant that all cases that were predicted to have lesser HRQOL were correctly predicted 64.6% of the time. This is visualized in Table 11.

Table 11

Model Summary

Total	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	110.158[a]	.092	.128

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Table[a]

Observed		Predicted		
		Num sum days		
		0	1	% Correct
Step 1	Num sum days 0	57	6	90.5
	Num sum days 1	18	13	41.9
	Overall Percentage			74.5

a. The cut value is .500

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

In Table 12, the Sig. column displays that none of the variables are statistically significant ($p < 0.05$).

Table 12

Logistic Regression Predicting Likelihood of better HRQOL based on smoking, alcohol, BMI, and activity using BMI as a continuous variable

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Alcohol(1)	.263	.549	.230	1	.632	1.301	.444	3.815
	Smoking(1)	-.079	1.262	.004	1	.950	.924	.078	10.967
	Activity(1)	-.588	.477	1.523	1	.217	.555	.218	1.413
	BMI	-.018	.041	.181	1	.670	.983	.906	1.065
	Constant	-.132	1.871	.005	1	.944	.876		

a. Variable(s) entered on step 1: Alcohol, Smoking, Activity, BMI.

In Table 13, the BMI was grouped by categories of underweight, normal weight, overweight, obese and morbidly obese. No BMI group was statistically significant with the sum of physically and mentally unhealthy days (HRQOL). There were also no statistically significant associations with smoking use, alcohol use, or inactivity with the HRQOL (unhealthy days) thus accepting the null hypothesis and rejecting the alternative hypothesis for these variables.

Table 13

Logistic Regression Prdicting Likelihod of Better HRQOL based on Smoking, Alcohol, Activity, and BMI as a categorical group

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Alcohol(1)	.423	1	.515
		Smoking(1)	.548	1	.459
		Activity(1)	1.624	1	.203
		groupbmi	6.136	4	.189
		groupbmi(1)	.268	1	.605
		groupbmi(2)	3.106	1	.078
		groupbmi(3)	3.700	1	.054
		groupbmi(4)	.478	1	.489
	Overall Statistics		8.761	7	.270

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Alcohol(1)	.391	.575	.462	1	.496	1.479	.479	4.566
	Smoking(1)	-1.116	1.146	.948	1	.330	.328	.035	3.095
	Activity(1)	-.582	.506	1.322	1	.250	.559	.207	1.507
	groupbmi			6.367	4	.173			
	groupbmi(1)	-.773	1.750	.195	1	.658	.461	.015	14.238
	groupbmi(2)	-.027	.835	.001	1	.974	.973	.190	4.997
	groupbmi(3)	-1.271	.861	2.176	1	.140	.281	.052	1.518
	groupbmi(4)	-1.153	.912	1.597	1	.206	.316	.053	1.887
	Constant	.940	1.385	.461	1	.497	2.560		

a. Variable(s) entered on step 1: Alcohol, Smoking, Activity, groupbmi.

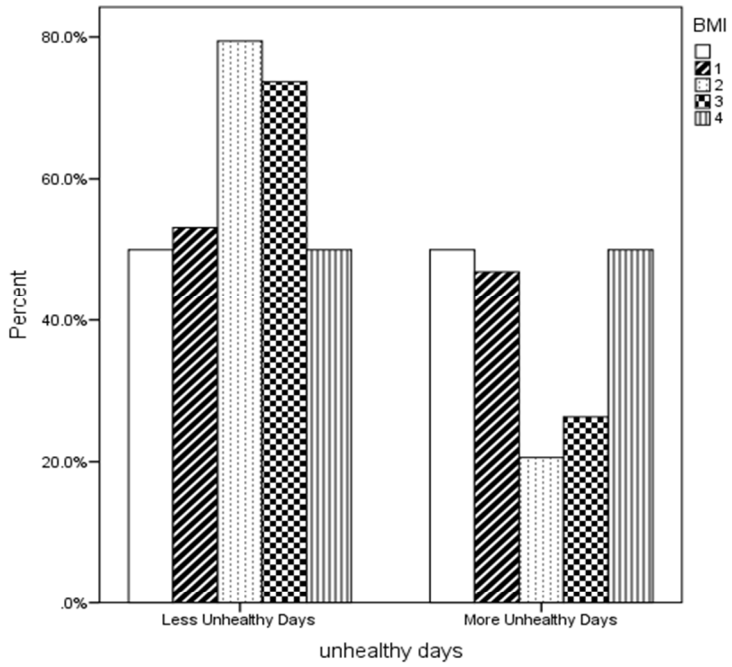

Figure 14. BMI group and number of unhealthy days.

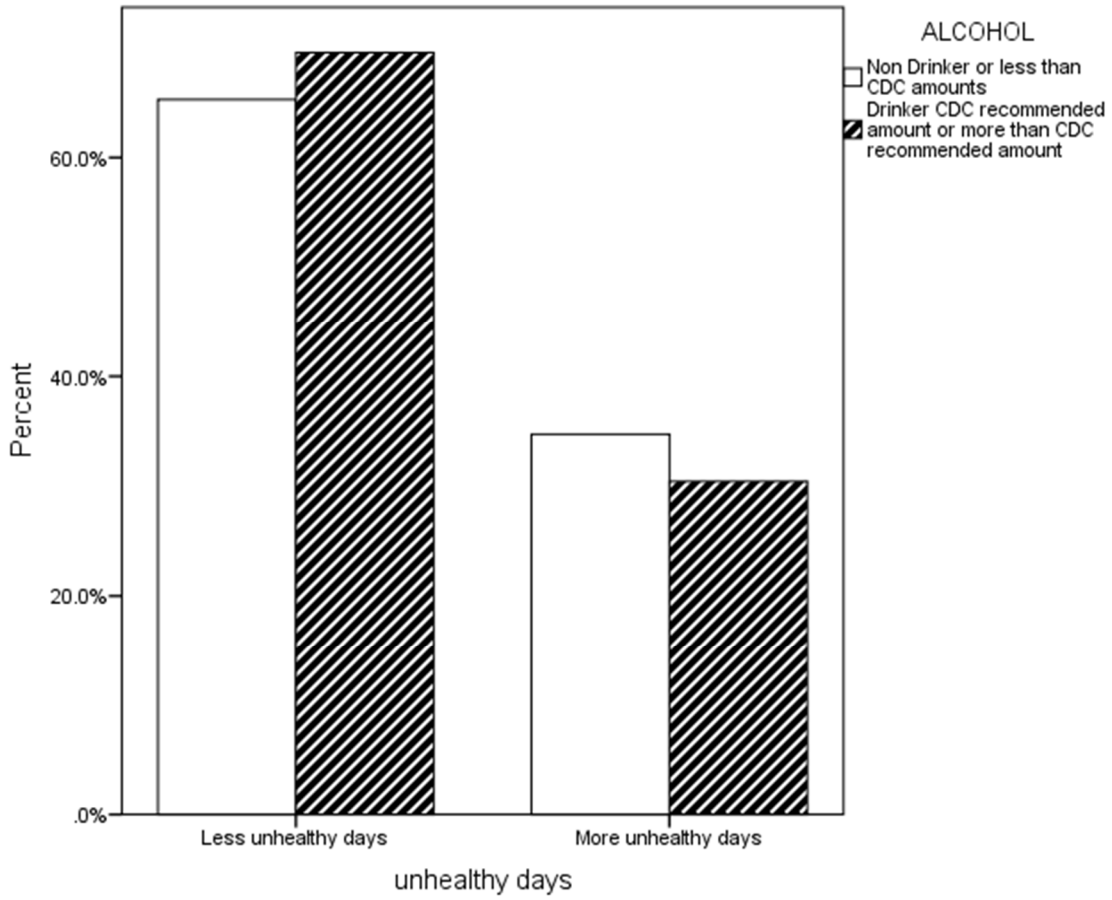

Figure 15. Alcohol use and number of unhealthy days.

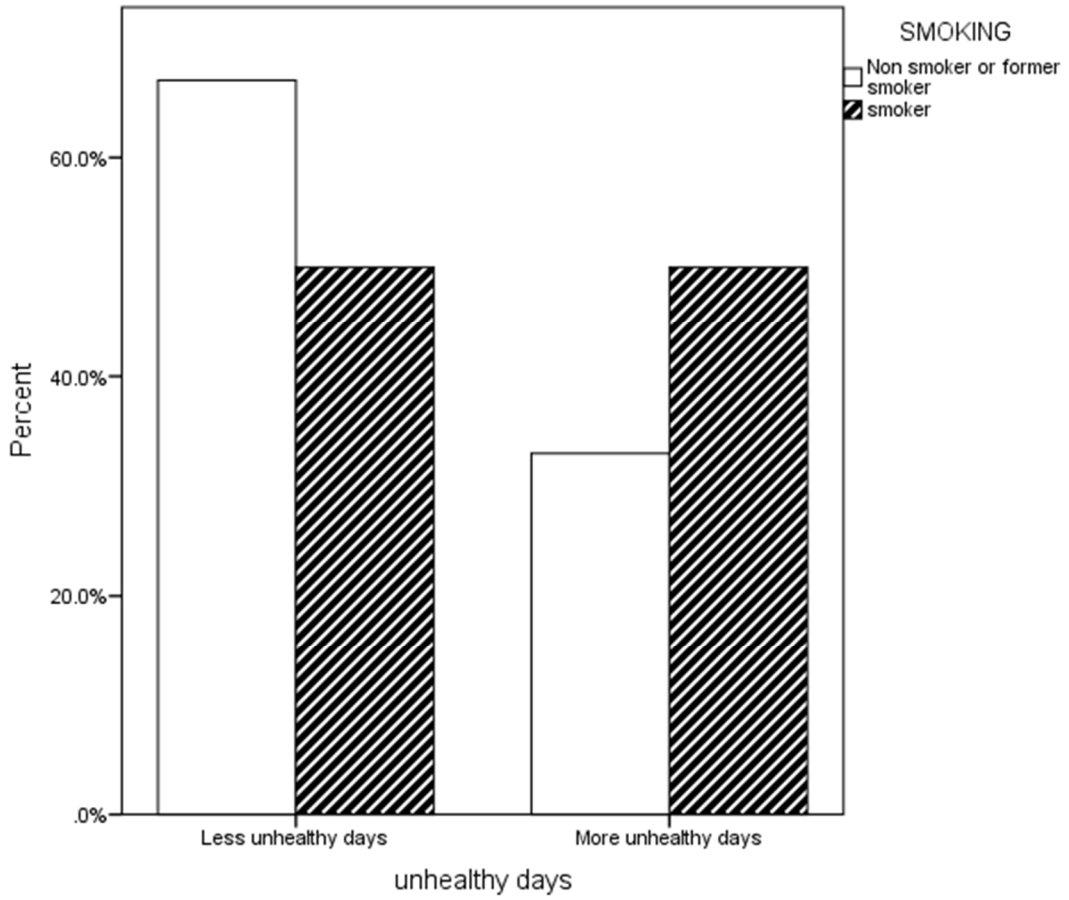

Figure 16. Smoking and number of unhealthy days.

RQ3: Is there an association between the MEQ score and the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States?

$H_0$3: The MEQ score is not associated with the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States.

$H_1$3: The MEQ score is associated with the HRQOL (as measured by the summary index of unhealthy days) of registered nurses in the United States.

I tested this research question using the Spearman Correlation which identified the strength and the direction of the association between the mindful eating score and the HRQOL as measured by the summary index of unhealthy days. Assumptions for Spearman correlation (Laerd, 2015b) were:

1. In order to comply with these assumptions, the HRQOL variable was changed back to the number of unhealthy days and made it a continuous variable. Therefore, there were 2 continuous variables which met the assumption.
2. The 2 variables needed to be paired observations which they were by choosing the option of "exclude cases pairwise."
3. The third and last assumption was to determine if there was a monotonic relationship between the 2 variables. A scatterplot was made that demonstrated that when the value of one variable increases in turn the other variable decreases which demonstrates a monotonic relationship. If the MEQ score increased then the number of unhealthy days should decrease.

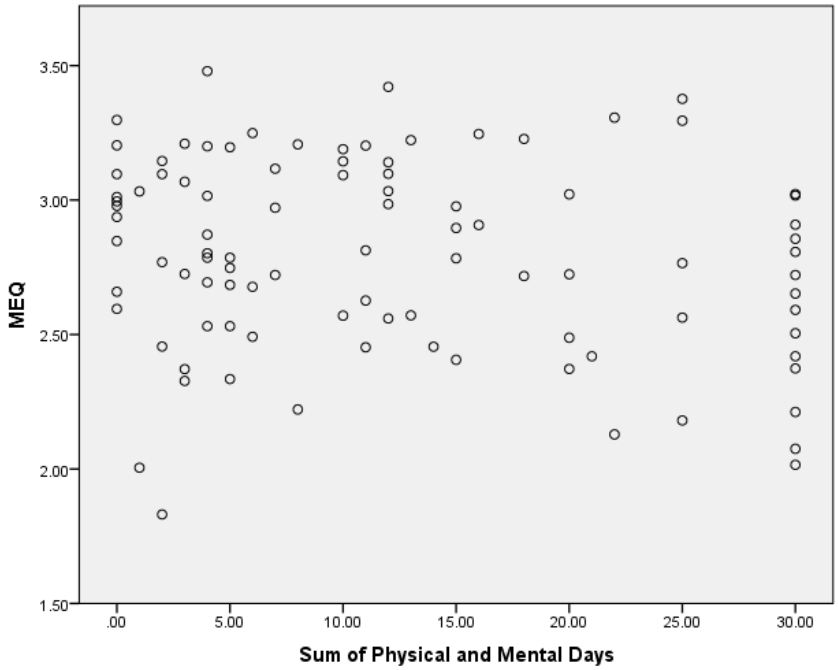

Figure 17. Scatterplot of MEQ score and sum of unhealthy days.

A Spearman's rank-order correlation was done through SPSS to assess the relationship between the amount of mindful eating (measured by the MEQ scores) and their number of unhealthy days (sum of physically and mentally unhealthy days) in RNs working in the United Sates. Preliminary data showed the relationship to be monotonic, as assessed by visual inspection of a scatterplot. There was no significantly statistical correlation between the mindful eating scores and the number of unhealthy days (HRQOL), (ρ (95) = -.172 and $p > .05$). This is demonstrated in Table 13.

Table 14

Spearman's Correlation of MEQ score and the Sum of Physically/Mentally Unhealthy Days

Correlations[a]

			MEQ	Sum of Physical and Mental Days
Spearman's rho	MEQ	Correlation Coefficient	1.000	-.172
		Sig. (2-tailed)	.	.095
	Sum of Physical and Mental Days	Correlation Coefficient	-.172	1.000
		Sig. (2-tailed)	.095	.

a. Listwise N = 95

There was no statistical significance between the Mindful Eating score and the HRQOL (sum of unhealthy days) therefore the null hypothesis was accepted and the alternative hypothesis was rejected. But when the unhealthy days were separated into physically unhealthy, mentally unhealthy days, and number of days that poor health affected daily activities (interrupted), there were significant results. The MEQ had a weak negative correlation with the number of mentally unhealthy days, ($\rho = -.261$, $p < .05$), MEQ score also had a weak negative correlation with the number of interrupted days, ($\rho = -277$ and $p < .05$). When MEQ score was analyzed with BMI, the MEQ had a moderate negative correlation with BMI, ($\rho = -.388$ and $p < .05$). The negative relationship means that when the MEQ score is high (more mindful eating) then the number of interrupted days, the number of mentally unhealthy days, and the BMI would be lower.

Table 15

Spearman's Correlation of BMI, MEQ Score, Number of Unhealthy Days in RNs

Correlations

			physical	mental	interrupted	BMI	MEQ
Spearman's rho	physical	Correlation Coefficient	1.000	.266**	.218*	.176	-.048
		Sig. (2-tailed)	.	.009	.034	.091	.646
		N	95	95	95	93	95
	mental	Correlation Coefficient	.266**	1.000	.387**	.041	-.261*
		Sig. (2-tailed)	.009	.	.000	.696	.011
		N	95	95	95	93	95
	interrupted	Correlation Coefficient	.218*	.387**	1.000	.134	-.277**
		Sig. (2-tailed)	.034	.000	.	.201	.007
		N	95	95	95	93	95
	BMI	Correlation Coefficient	.176	.041	.134	1.000	-.388**
		Sig. (2-tailed)	.091	.696	.201	.	.000
		N	93	93	93	93	93
	MEQ	Correlation Coefficient	-.048	-.261*	-.277**	-.388**	1.000
		Sig. (2-tailed)	.646	.011	.007	.000	.
		N	95	95	95	93	95

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

During exploration of the data, I searched for any correlations among the domains of mindful eating with the unhealthy days. Awareness had a weak negative correlation with the number of mentally unhealthy days, ($\rho = -.242$, $p < .05$). Distraction and External domains had no significant correlation. Disinhibition also had a weak negative correlation with the number of mentally unhealthy days, ($\rho = -.320$, $p < .05$) and a weak negative correlation with the number of days that poor health affected daily activities ($\rho = -.324$, $p < .001$). The emotional domain also had a weak negative correlation with both

the number of mentally unhealthy days, ($\rho = .219$, $p < .05$) and the number of days that poor health affected daily activities, ($\rho = -.370$, $p < .05$).

Table 16

Spearman's Correlation of the Domains of MEQ and the Number of Unhealthy Days in RNs

Correlations

			physical	mental	interrupted	Awareness	Distraction	Disinhibition	Emotional	External	Summary
Spearman's rho	physical	Correlation Coefficient	1.000	.266**	.218*	-.100	.076	-.155	-.081	.096	-.048
		Sig. (2-tailed)	.	.009	.034	.333	.465	.133	.434	.352	.646
		N	95	95	95	95	95	95	95	95	95
	Disinhibition	Correlation Coefficient	-.155	-.320**	-.324**	.342**	.256*	1.000	.629**	-.165	.706**
		Sig. (2-tailed)	.133	.002	.001	.001	.011	.	.000	.104	.000
		N	95	95	95	98	98	98	98	98	98

(*table continues*)

		physical	mental	interrupted	Awareness	Distraction	Disinhibition	Emotional	External	Summary
interrupted	Correlation Coefficient	.218*	.387**	1.000	-.046	-.097	-.324**	-.370**	.082	-.277**
	Sig. (2-tailed)	.034	.000	.	.661	.348	.001	.000	.427	.007
	N	95	95	95	95	95	95	95	95	95
Awareness	Correlation Coefficient	-.100	.242*	-.046	1.000	.150	.342**	.249*	.236*	.649**
	Sig. (2-tailed)	.333	.018	.661	.	.140	.001	.014	.019	.000
	N	95	95	95	98	98	98	98	98	98
Distraction	Correlation Coefficient	.076	.007	-.097	.150	1.000	.256*	.370**	-.169	.601**
	Sig. (2-tailed)	.465	.943	.348	.140	.	.011	.000	.096	.000
	N	95	95	95	98	98	98	98	98	98
Emotional	Correlation Coefficient	-.081	-.219*	-.370**	.249*	.370**	.629**	1.000	-.305**	.724**
	Sig. (2-tailed)	.434	.033	.000	.014	.000	.000	.	.002	.000
	N	95	95	95	98	98	98	98	98	98
External	Correlation Coefficient	.096	.064	.082	.236*	-.169	-.165	-.305**	1.000	.100
	Sig. (2-tailed)	.352	.535	.427	.019	.096	.104	.002	.	.327
	N	95	95	95	98	98	98	98	98	98

(*table continues*)

			physical	mental	interrupted	Awareness	Distraction	Disinhibition	Emotional	External	Summary
	Summary	Correlation Coefficient	-.048	-.261*	-.277**	.649**	.601**	.706**	.724**	.100	1.000
		Sig. (2-tailed)	.646	.011	.007	.000	.000	.000	.000	.327	.
		N	95	95	95	98	98	98	98	98	98

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 17

Crosstabulation of Means and Std. Deviations of MEQ Domains and BMI groups of RNs

Summary Awareness Distraction Disinhibition Emotional External * bmigroup

bmigroup		Summary	Awareness	Distraction	Disinhibition	Emotional	External
	Mean	3.2270	3.2857	2.8000	3.7250	3.2000	3.1133
	N	2	5	5	5	5	5
	Std. Deviation	.27392	.34993	.29814	.24044	.77862	.50750
	Mean	2.4591	2.6250	2.5000	2.3415	2.1875	2.6417
mo	N	8	8	8	8	8	8
	Std. Deviation	.38674	.32341	.53452	.57075	1.02426	.43562
	Mean	2.9306	2.6964	2.9219	3.2561	3.3359	2.4427
nw	N	32	32	32	32	32	32
	Std. Deviation	.28767	.57687	.67599	.55739	.55580	.49926
	Mean	2.6965	2.5714	2.7018	2.9164	2.7193	2.5737
ob	N	19	19	19	19	19	19
	Std. Deviation	.34549	.47619	.69295	.57870	.55640	.53847
	Mean	2.7618	2.6933	2.7353	2.9464	2.8407	2.5931
ow	N	34	34	34	34	34	34
	Std. Deviation	.34123	.51343	.57313	.58036	.78613	.46672
	Mean	2.7899	2.6953	2.7738	3.0321	2.9439	2.5707
Total	N	95	98	98	98	98	98
	Std. Deviation	.35373	.52163	.62142	.62269	.76290	.50306

Table 18

Crosstabulation of Means and Std. Deviations of MEQ Domains and Presence of Chronic Disease in RNs

Summary Awareness Distraction Disinhibition Emotional External * chronic

chronic		Summary	Awareness	Distraction	Disinhibition	Emotional	External
	Mean	2.8321	2.6389	2.8287	3.0610	3.0903	2.5417
No Disease	N	36	36	36	36	36	36
	Std. Deviation	.34493	.51845	.61397	.67586	.77264	.50787
	Mean	2.8755	2.8027	2.8254	3.1190	3.1190	2.5111
1 chronic disease	N	21	21	21	21	21	21
	Std. Deviation	.31874	.57049	.70411	.42988	.68342	.43885
	Mean	2.7874	2.7013	2.8030	3.1039	2.9091	2.4197
2 chronic diseases	N	22	22	22	22	22	22
	Std. Deviation	.29402	.44067	.59681	.56320	.71358	.49331
	Mean	2.7468	2.7460	2.5556	2.8750	2.7500	2.8074
3 chronic diseases	N	9	9	9	9	9	9
	Std. Deviation	.44279	.54762	.68718	.68651	.64952	.45545
	Mean	2.3794	2.3061	2.5238	2.3265	2.0357	2.7048
more than 3 chronic diseases	N	7	7	7	7	7	7
	Std. Deviation	.35770	.39922	.53945	.58899	.71339	.45028
	Mean	2.7899	2.6752	2.7737	3.0120	2.9447	2.5439
Total	N	95	95	95	95	95	95
	Std. Deviation	.35373	.51315	.62876	.62029	.76431	.48415

Summary

In summary, the sample size was not large enough to show statistical significance but the demographic information was interesting. All three research questions were answered. Perceived job stress demonstrated a weak positive correlation with the number of mentally unhealthy days ($\rho = .275$, $p < .05$) and with the sum of the unhealthy physically and mentally unhealthy days which had to be 30 or less, ($\rho = .203$, $p < .05$). Therefore, I rejected the null hypothesis and accepted the alternative hypothesis. In

research question two, out of the four predictor variables there were no statistically significant associations with BMI, smoking use, alcohol use, or inactivity with the HRQOL (unhealthy days) thus I accepted the null hypothesis and rejected the alternative hypothesis for these variables. For the last research question, there was no significantly statistical correlation between the mindful eating scores and the sum of unhealthy days (HRQOL), (ρ 95)= -.172 and $p > .05$, therefore the null hypothesis was accepted and the alternative hypothesis was rejected. But when the unhealthy days were separated into physically unhealthy, mentally unhealthy days, and number of days that poor health affected daily activities (interrupted), there were some significant results. The MEQ had a weak negative correlation with the number of mentally unhealthy days, ($\rho = -.261$, $p < .05$), MEQ score also had a weak negative correlation with the number of interrupted days, ($\rho = -277$ and $p < .05$). When MEQ score was analyzed with BMI, the MEQ had a moderate negative correlation with BMI, ($\rho = -.388$ and $p < .05$). In the following Chapter 5, the results will be discussed with conclusions and recommendations for further research in this field.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this quantitative study was to determine to what extent work demands, measured by perceived job stress, affected the HRQOL (number of unhealthy days) of registered nurses in the United States. This study also investigated to what extent other variables such as BMI and certain lifestyle behaviors affected the HRQOL (number of unhealthy days) as well. The independent variables were perceived job stress, weight (BMI), and lifestyle factors such as tobacco and alcohol (ETOH) use, physical activity, and mindful eating, and the dependent variable was the HRQOL (measured by the summary index of unhealthy days) of the RNs. Other demographic variables were also analyzed to see if there were any other significant relationships could be identified.

This research was needed because nursing is a stressful profession, the nursing workforce is aging, and there were few studies examining American nurses and job stress affecting the HRQOL. This research provides some insight into the level of perceived job stress and how nurses' lifestyle behaviors may affect their HRQOL.

Key findings in this research were limited in their interpretation due to the small sample size. The study did show that in this sample of 95 American nurses:

- most nurses were age 40 or over (74%);
- a majority of nurses were at the graduate degree level of education (55% and almost 10% with doctorate degrees);
- a majority of nurses had greater than 20 years' experience in the nursing field (51%);

- a majority of nurses were Caucasian ethnicity (92%) and female (approximately 95%);
- 58% of the nurses were either overweight (33%), obese (18%), or morbidly obese (8%), and the mean BMI was 27.63, which is the overweight classification;
- perceived job stress demonstrated a weak positive correlation with the number of mentally unhealthy days ($\rho = .275$, $p < .05$) and had a weak correlation to the sum of the unhealthy physically and mentally unhealthy days (maximum of 30 days);
- out of the 4 predictor variables, no variables were statistically significant when BMI was used as a continuous variable as well as a categorical variable;
- there was no significantly statistical correlation between the mindful eating scores and the number of unhealthy days (HRQOL), ($\rho(95) = -.172$, $p > .05$); and
- when the unhealthy days were separated into physically unhealthy days, mentally unhealthy days, and the number of days that poor health affected daily activities (interrupted), the MEQ had a weak negative correlation with the number of mentally unhealthy days, ($\rho = -.261$, $p < .05$), MEQ score also had a weak negative correlation with the number of interrupted days, ($\rho = -277$, $p < .050$, and when MEQ score was analyzed with BMI, the MEQ had a moderate negative correlation with BMI ($\rho = -.388$, $p < .05$).

Interpretation/Findings

The results of this research were similar to the ANA's preliminary findings from October, 2013, to October, 2014, in their Health Risk Appraisal survey. Demographics were similar in that most of the nurses were female, Caucasian, educated at BSN level and had more years of experience, which would put them at an older age although age was not mentioned in the ANA study (ANA, 2017). This study did have more graduate level nurses, but this was most likely due to the NPACE advertisement.

In comparison to the Minority Nurse (2015), who retrieved their data from the Bureau of Health Professions, National Center for Health Workforce Analysis (2013) and the U.S. Department of Health and Human Services, Health Resources and Services Administration (2010), there were approximately 2,824,641 RNs in the United States (Minority Nurse, 2015). In gender statistics, only 9.1% of these RNs were men. Age-wise, the average age of an RN was 44.6 years old. Similar to my sample findings, 9.9% or approximately 279,600 of RNs were African American, 8.3% were Asian, 4.8% Hispanic, and 0.4% Native American or Alaskan Native (Minority Nurse, 2015). The largest minority group was also found in the Pacific region of the nation, 30.5%, compared to other parts of the country (Minority Nurse, 2015).

Work stress results were similar to other studies done (ANA, 2011; Almajwal, 2016; ANA, 2017). In this study, the median response for perceived job stress was "moderately stressful" (Almost 48%). In this study, perceived job stress did have a weak correlation with the number of mentally unhealthy days and the total sum of both

physically and mentally unhealthy days. A larger sample would be needed to show significant results.

Tobacco results in this study were similar to other studies done. Only 4% of nurses smoked tobacco. The results did not conclude anything especially there were a few number who smoked. Alcohol use was measured by the CDC guidelines of 1 drink per day for women, and 2 drinks per day for men. The results showed that 76% were nondrinkers or drank below the CDC recommendations and the other 24% drank either at the recommended CDC amount per week or more. The general population of "heavy drinkers" which CDC reported as 6.7% in 2014 (CDC, 2014). The results did not show any significant relationship with stress or HRQOL.

In this study, the nurses' BMI was calculated by me from the self-reported height and weights. The NHIS data demonstrated that the healthcare industry has the highest rate of prevalence of obesity at 32% (Shah et al., 2013). Approximately 58% of this sample of nurses were either in the overweight, obese, or morbidly obese BMI category with 18% obese. Only 41% had a normal or underweight BMI. The mean BMI was approximately 28 which is considered overweight. In the 2015 APA Stress in America survey, 58% of adults were overweight or obese (APA, 2015). In nurses, the ANA Health Risk Assessment in June 2012 surveyed 350 nurses and 70% were either overweight or obese with 40% obese (ANA, 2016). This is a large increase from the study done in 2008, where 54% of nurses were overweight or obese (Miller et al., 2008). Lower BMI was statistically significant with having a better HRQOL

Physical Inactivity was measured by using the CDC recommendations. Participants who performed less than the CDC recommendations were considered physically inactive. In this study, approximately 59% exercised below the CDC recommendations. These results are similar to the APA Stress in America survey done in 2015 that showed that 22% of the adults did not engage in exercise (APA, 2015). In the ANA Health Risk Assessment done in 2012, only 35% exercised more than 4-5 times a week (ANA, 2014). Perhaps due to the small sample size, there were no significant correlations found between exercise and the number of unhealthy days.

The MEQ score ranged from 1-4 with 4 being the most mindful. The mean total MEQ score was 2.79 out of 1-4. This is lower than in the study that was done on nonnurses to test the MEQ as an instrument (Framson et al., 2009). In the Framson et al. (2009) study, the mean MEQ score was 2.92 and MEQ score had a negative association with BMI and positive association with yoga (Framson et al., (2009). There was a weak negative correlation between the score and the number of mentally unhealthy days, the sum of physically and mentally unhealthy days, and the number of unhealthy days that prevent normal daily activities (interrupted). The MEQ had a moderate negative correlation with BMI. Out of the 5 domains, the awareness, disinhibition, and emotional domains weakly correlated with the number of mentally unhealthy days and the number of unhealthy days that prevented normal daily activities. The highest mean score in the 5 domains was disinhibition. Due to the limitations of the wording of the questions, I believe that the nurses may have not understood the context of the questions. Therefore, the MEQ score may not be reliable in this case, especially with the low sample size. This

also made it difficult to make any associations between the variables and the domains of the MEQ.

The limitation of measuring the HRQOL using the SPSS syntax recommended by the CDC was that most of this sample had good, very good, or excellent HRQOL. However, I used the sum of the unhealthy days and treated it as a dichotomous variable. I also used the physically unhealthy days as well as the mentally unhealthy days as continuous variables. There was some weak correlation between the number of mentally unhealthy days and the level of perceived jobs stress as well as the sum of unhealthy days. Despite having chronic diseases, this sample of nurses overall had a good HRQOL, which was demonstrated with fewer unhealthy days.

The results did not strongly relate to the evidence shown by Mark and Smith in their proposed DRIVE model (Mark & Smith, 2008), perhaps due to low sample size and statistical power. However, there was weak evidence that perceived job stress, which measured the work demands in the model, did correlate with the number of mentally unhealthy days, which is the "health outcomes" in the model. The BMI, which was an individual characteristic, did show some correlation with the HRQOL as well. The MEQ score (again an individual characteristic) had a weak negative correlation with the number of mentally unhealthy days.

Limitations

One of the major limitations of the study was the small sample size. Therefore, this decreased the validity and reliability of the results. This was not a randomized sample, and therefore it cannot be generalized to the American nursing population as a

whole. Trustworthiness includes internal validity, external validity, reliability, and objectivity (Polit & Beck, 2014). Threats to internal validity were decreased by using instruments that were reliable and valid. Temporal ambiguity still was a threat because I was unable to determine if the perceived job stress affected the HRQOL or there were other factors that may have affected the HRQOL. The sample did not represent enough nurses with low HRQOL, and therefore the sample did not have a normal distribution. Also, statistical regression was not ideal due to low sample size. External validity was threatened due to sampling technique. The sample would have been more robust if there were more participants as well as the ability to randomize. The participants also may have experienced survey fatigue with 50 questions. Reliability and objectivity was threatened because the participants seemed not to understand some of the MEQ. The wording of some of the questions, such as "I recognize when food ads make me want to eat" seemed to cause the participant to answer whether the food ads made them want to eat instead of did they recognize that they did. There were a few questions that were worded like this: "I recognize when . . . ," and "I notice when . . . ." Some of the assumptions were false, such as not all the NPACE readers opened their e-mails with the e-newsletters. Unfortunately, only 27-30% opened their e-mails, which was determined by the advertisement company. Also, the sample was not as diverse as the research had originally anticipated, with most of the participants being Caucasian and female.

Recommendations

Recommendations for future research would include conducting the study with a larger sample of participants; perhaps mailing the survey with reminders would be more

successful although more expensive in achieving a larger sample. Another means of increasing the sample size would be to attend a nursing conference and sharing survey in person. I could purchase the board of nursing list of addresses of RNs in certain states and choose random participants. This could increase randomization, generalization, and diversity. This also would give a more normal distribution of variables within the sample. I was disappointed to find that my sample was not very diverse. Another study could be done using ethnic nursing groups on social media to attract more of a diverse sample. This is an area that is lacking in research in the United States since most of the survey responders seem to be Caucasian unless they are done outside of the United States in other countries.

I could also examine more of the elements of the enhanced DRIVE model, such as personal resources analogous to coping strategies or methods and support systems. Also, more individual differences such as other stressors in their life may be health stressors, family stressors, etc. The mindful eating may be more helpful assessing only the eating behaviors at work versus the rest of the time. More nurses skip lunch breaks, eat on the run, and eat while performing other tasks due to the nature of the busy work environment. The MEQ's wording seemed to be perceived differently by some nurses in the sample causing the MEQ score not to be as accurate. This questionnaire could be done in person or have better instructions at the beginning of the survey.

I did not expect to find that most of the chronic disease found in the sample were anxiety and depression. I was unable to tell if the participants had treated or untreated anxiety and depression, therefore adding a depression scale could be beneficial. Also,

what was the cause of the depression and anxiety in the sample? Other factors, besides job stress should be explored. Even though most in the sample had anxiety and/or depression, most reported a high HRQOL which leads me to believe that the nurses were being treated for their depression and anxiety. Are work sites addressing the mental health needs of their nursing staff? Further research on ethnicity and chronic disease in nurses also could be studied. According to the CDC (2013), African Americans are about twice as likely to be diagnosed with diabetes by a physician, and 60% more likely to have a stroke than white adults. Therefore, more research is needed with nursing and ethnic disparities.

I was surprised to find that most nurses in the sample did not smoke or drink alcohol over the recommended amount, but this is great news. Elevated BMIs and physical inactivity seemed to be the lifestyle behaviors that were dominant versus smoking and drinking. More research could be done on examining characteristics of nurses who regularly exercise and who do not to find similarities and/or differences. Also, examining barriers to regular weekly exercises would be helpful to find more solutions to this problem. BMI had a negative correlation of moderate strength with the MEQ score. This means that when the BMI is low than the MEQ score would be higher which would be expected. Perhaps, using the MEQ score to assess people who have weight problems would be helpful and lead to other interventions besides diet control.

Implications

This research could affect social change in the nursing field. On an individual level, nurses could have an increased awareness of poor lifestyle behaviors and their

eating patterns. Nurses may be able to incorporate more mindful awareness skills in their eating behaviors. Also, nurses may be more aware that their coping methods may not be working. Organizationally, hospitals may be able to offer nurses more opportunity for organized physical exercise at the worksite-such as allowing enough time for walking during lunchbreak. Hospitals could also offer education on mindful eating awareness so that more nurses are able to take their lunch breaks, not be distracted with eating while working, and avoid eating triggers-like having more healthy foods available. This research could increase overall awareness of obesity, lack of physical activity, and poor eating behaviors at work in general. This could cause work places to offer employees more benefits at work-such as, exercise classes, stress relief, mindful eating programs, and weight loss plans at work which would increase accountability and encourage participation. This would affect the patient environment by enabling nurses to become better role models for their own patients. Nurses would share their knowledge with their patients to assist them in their own health behaviors. Social change is needed to explore barriers for different ethnic groups becoming RNs since the numbers appear low in 2008-2013 data. Therefore, more research is needed on nurses of different ethnicities to identify the stressors, lifestyle behaviors, and HRQOL.

Conclusion

Although the sample size was low, the research did identify some main themes. Obesity remains a concern in the American population especially RNs as well as physical inactivity. The nursing population is indeed becoming older which can lead to more health issues. Despite, the majority of nurses perceiving stress in this sample, they still

had at least good HRQOL. More research must be done on the causes of obesity and a way to motivate nurses to keep a healthy weight. Perhaps a qualitative or mixed methods approach into eating behaviors of nurses would identify factors that are contributing to the obesity epidemic. This study identified a demographic profile of a small group of nurses in the United States. The results demonstrated that nurses do have a moderate amount of job stress but are still reporting a positive HRQOL. The results also did show that lack of activity outside of work, and higher weights are still a problem that needs to be addressed in today's nursing workforce.

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Appendix A: Permission to use Mindful Eating Questionnaire

On 11 Jul 2016 7:55 pm,

Dear Jen,

I'm granting permission for you to use the Mindful Eating Questionnaire (MEQ) for your project, including publishing the results. Please follow the requirements outlined below.

Requirement -- SurveyMonkey version of survey:

- You will be the only person setting up the electronic questionnaire and accessing the data in SurveyMonkey.

- The electronic version of the questionnaire will be used within Survey Monkey to collect information for this study only.

- The electronic version of the questionnaire will not be shared with any other investigators for any reason.

- The electronic version of the questionnaire will include the citation and permission. The citation/permission would be something like: *Mindful eating behavior was assessed using the Mindful Eating Questionnaire developed by Framson et al. and described in Development and Validation of the Mindful Eating Questionnaire. J Am Diet Assoc 2009; 109; 1439-1444. Used with permission of the Nutrition Assessment Shared Resource/Fred Hutchinson Cancer Research Center.*

Requirement -- Publications and presentations:

- Publications and presentation will acknowledge the source of the questionnaire as outlined above.

Copy of MEQ and scoring information:
I've attached a clean copy of the MEQ and the scoring information.

FYI – each item is scored from 1 to 4, where higher scores signify more mindful eating (never/rarely = 1; sometimes = 2; often = 3, usually/always = 4). See the note at the bottom of the scoring page re 'reverse before scoring' for items marked with an (*). For more info, see the reference (Framson, et al) also at the bottom of the scoring page.

[redacted]

[redacted]

SCORING MINDFUL EATING QUESTIONNAIRE QUESTION RESPONSE

Awareness 10 ____ 12 ____ 16 ____ 21 ____ 20 ____ 22 ____ 26 ____

Total ____ score = sum ÷ number of items answered

Distraction 1* ____ 6* ____ 28* ____ Total ____ score = sum ÷ number of items answered

Disinhibition 2* ____ 5 ____ 7* ____ 9* ____ 11* ____ 15 ____ 18* ____ 25 ____

Total ____ score = sum ÷ number of items answered

Emotional 13* ____ 17*# ____ 19* ____ 27* ____ Total ____ score = sum ÷ number of items answered

External 3 ____ 4# ____ 8# ____ 14 ____ 23# ____ 24 ____ Total ____ score = sum ÷ number of items answered

Summary Score = sum of subscale scores average of each subscale scores ÷ 5

*Reverse before scoring: (1=4, 2=3, 3=2, 4=1)

#Do not count in numerator or denominator if the “not applicable” option is selected

Reference: Framson C., Kristal A., Schenk J., Littman, A, Zeliadt, S. & Benitez D. (2009). Development and validation of the Mindful Eating Questionnaire. *Journal of American Dietetic Association, 109*,1439-1444. Used with permission of the Nutrition Assessment Shared Resource/Fred Hutchinson Cancer Research Center.

Appendix C: Permission to Use Dr. Mark & Dr. Smith's Enhanced DRIVE Model

Hi Dr. Smith,
I'm working on my dissertation for a PhD in Public Health/Epidemiology at Walden University. I would like to use your Enhanced DRIVE model and the Work Demands (perceived job stress question) for my dissertation survey. I could not find an address for Dr. Mark and hope that you would be able to grant permission for the both of you.

I am investigating RNs in the United States and if job stress affects the Health-Related Quality of Health (HRQOL). Also, I will investigate the effects on obesity, binge eating, and the presence of chronic disease. I originally wanted to have a sample of diabetic nurses but I think I will be able to obtain a higher sample this way.

I hope that you will give me permission to reference your model and your perceived job stress question in my dissertation. Your model seems to fit perfect with my research plan. I think it will be a very interesting study. Thanks for your time.

Sincerely,
Jen Limongiello

9/28/2015

Andrew Smith SmithAP@cardiff.ac.uk
Hi Jen,

It sounds an interesting project. Feel free to use our model and measures.

Best regards,

Andy

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