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Stress in New Graduate Nurses: Can They Sweat It? A Correlational Study of Exercise and Stress in New Graduate Nurses

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ABSTRACT

Stress in New Graduate Nurses: Can They Sweat it? A correlational study of exercise and stress in new graduate nurses

Stress in new graduate nurses has been a known issue in nursing for decades. The number of new graduate nurse turnover rates has reached up to 50% within the first three years of practice, according to some studies. Most new graduate nurses who choose to leave their job, or even the profession, cite stress as a major factor.

Methods: Single point correlation survey of new graduate BSN students in Southern California (n=32).

Results: Initial results showed a statistically significant difference between those who exercised three to five hours per week, versus those who exercised more than five hours per week. However, this difference was not seen on the final analysis. All but 3 of the respondents reported that their shift schedule impacted their desired exercise routine.

Recommendations: Stress, and ways to mitigate it, in new graduate nurses remains a priority to address in new graduate nurses. Education on factors that can mitigate stress, such as exercise, may be beneficial, but expectations for their work-life balance also need to be addressed with new graduate nurses.

Kathleen Helgesen

April 2017

Stress in New Graduate Nurses: Can They Sweat it?

A correlational study of exercise and stress in new graduate nurses

by

Kathleen Helgesen, RN, DNPc, CPNP-PC

A project submitted in partial

fulfillment of the requirements for the degree of

Doctor of Nursing Practice

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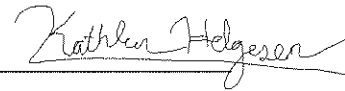
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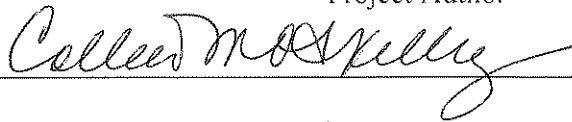
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CHAPTER 1: INTRODUCTION

New graduate nurses are a population at risk of leaving their places of employment, or even career, because of stress (Phillips, Kenney, Esterman & Smith, 2014; Wu, Fox, Stokes & Adam, 2012). This phenomenon is of great concern in nursing, with our aging workforce, as well as increased demand for nurses. This study examined the correlation between stress and exercise. Exercise has been well documented in the literature to decrease stress in other populations (Jayakody, Gunadasa, & Hasker, 2014; Ross & Thomas, 2010), but there is little known about the effect of exercise on new graduate nurses.

Stress is a concept that is often discussed, but defined differently, depending on who is defining it. Hans Selye, known as the father of stress research, defined stress as the way a person's unconscious-self responds to a change in its environment (Szabo & Glavin, 1990). Stress is also defined as: "A state of mental tension and worry caused by problems in your life, work, etc." and, "something that causes strong feelings of worry or anxiety" (Mirriam-Webster, n.d.). Psychology Today (2016) defined stress as "a reaction to a stimulus that disturbs... physical or mental equilibrium." Regardless of the definition one uses, it is clear that it relates to the body's response or reaction to an external stimuli or demand placed upon it. Finding ways to mitigate the body's stress response in new graduate nurses is the focus of this study.

The essential research question addressed in this study was: Do new graduate nurses who report 180 minutes (3 hours) or more of exercise per week have a

lower perceived level of stress than those who report 120 minutes (2 hours) or less?

Given the number of new nurses that leave the nursing field because of stress, finding healthy ways to cope with stress is crucial (Wu et al., 2012). Exercise has been well documented in improving physical and emotional health (Jayakody, et al., 2014; Ross & Thomas, 2010). The amount of exercise studied here was based upon the current recommendations by the American Heart Association and the American College of Sports Medicine, which is a minimum of 150 minutes (2.5 hours) per week (Haskell, et al., 2007) for adults 18 and over. The hypothesis was that those who exercise at least 3 hours will have less stress than those who exercise less than 2 hours. The researcher also evaluated if different amounts of time (other than 2 hours and 3 hours per week) have different correlations with stress.

Background

Stress in new nurses has been a concern for some time, but a solution has not yet been realized. The demands on a nurse's time and energies have increased over the last several decades, with multifactorial causes including: workload levels, inability to contact a provider, lack of managerial support, interpersonal issues, issues with patient's family members, and shift work (Happell, Dwyer, Reid-Searl, Burke, Caperchione & Gaskin, 2013). In new graduate nurses, stress has been a well-documented concern that is associated with high attrition rates; these new nurses are changing employers, and some are even leaving the nursing profession completely (Phillips et al., 2014; Wu, et al., 2012). The Joint Commission (n.d.) reported that as new graduate nurses left their initial place of employment, their turnover decreased morale among remaining staff, caused

increased training costs to the hospital, and was ultimately associated with decreased patient care and satisfaction.

The transition period for new graduate nurses is a commonly discussed topic, as the first 12-18 months of practice can pose many safety concerns for patients, as well as financial concerns for hospitals (Phillips et al., 2014; Wu et al., 2012). It is a time when new nurses are exposed to the realities of bedside nursing, without an instructor at their side. They are now licensed and charged with independently caring for patients, with or without a preceptor. New nurses are learning how to delegate tasks, while also managing multiple patients with complex diseases. This learning period can be a very stressful time for new nurses as they go through this transition. Attrition of new graduate nurses creates a financial burden for hospitals, along with the new nurse holding a degree they don't plan to use (Unruh & Nooney, 2011).

Stress is a major factor in new graduate nurses' decisions to leave their employment or even the nursing profession (Chang, Hancock, Johnson, Daly & Jackson, 2005). Given the effect of stress on attrition rates, methods to mitigate stress must be identified in this population. Exercise is one possible tool to help new graduate nurses manage their stress. Exercise has been shown to improve physical and emotional health, as well as reducing stress in other populations (Jayakody et al., 2014; Ross & Thomas, 2010). Based on these findings, exercise and its correlation to stress in new graduate nurses was the variable studied. The AHA recommendation of 150 minutes of exercise per week (Haskell et al., 2007) was the basis for determining what levels of exercise to study in new nurses.

Purpose of the study

The research hypothesis for the study was: three or more hours of exercise per week positively affects the perceived level of stress in new graduate nurses versus those who exercise less than 2 hours per week. If this hypothesis was supported, the intent was to disseminate this information to students in their senior year of a baccalaureate program. The ultimate desired effect of this study was to explore a way to potentially mitigate the amount of stress that new graduate nurses experience. This study explored if exercise was correlated with reduced stress in this sample, with the intent to identify a simple stress management tool for new graduate nurses.

Theoretical Framework

The Stages of Transition theory is a framework that was first published by Duchscher (2008). The theory was developed after 10 years of research on new graduate nurses, based on the author's exploration of the existing theoretical frameworks, as well as her vast experience of working with this population. During this timeframe, Duchscher established a (Canadian) national non-profit organization to support new graduate nurses, as well as provide resources to navigate their transition into nursing practice. Duchscher found that there was a need for a new theory to address this population specifically. The theory was created by Duchscher to ease the transition of new graduate nurses, assist those working with them, and increase retention rates. The stages of transition theory provides a framework for examining how new nurses walk through three major transitions- doing, being, and knowing (2008).

Duchscher's theory is similar to Benner's novice to expert theory (1982), which differentiates five different stages of skill acquisition as a nurse- novice, advanced beginner, competent, proficient, and expert. However, Benner's theory focuses on the

new nurse over a several year timeframe, whereas Duchscher's theory focuses on the first 12-18 months of practice. Novice to expert theory addresses what qualifies each stage in this transition from novice to expert (1982), whereas the stages of transition theory focuses solely on the novice nurse, and breaks that stage into three, more in depth stages: doing, being, and knowing (2008). Duchscher described the stage of doing as a period of learning and performing nursing tasks, while still feeling like a student, and having an idealistic view of nursing, as well as much frustration with their inability to function as an experienced nurse (p.444). Duchscher stated that the new nurse moves on to a period of being once they start to realize their growth as a nurse and their autonomy in practice. This stage is marked by rapid growth in critical thinking, as well as skills and competency (p. 446). Lastly, Duchscher described the final stage as knowing: a period where the new nurse feels confident in their ability to practice as a nurse, and accepts their identity within the nursing profession (p. 447).

Duchscher's theory includes elements of what the nurse can perform at each level, similar to Benner's model, but this theory also addresses the stress that occurs at each transition, and is designed specifically to address the needs of the novice nurse, as well as ease the transition between each stage (2008). While Duchscher's theory doesn't address exercise to reduce stress, the Stages of Transition theory is ideal for a study investigating the correlations between stress and exercise in this population.

The Stages of Transition theory examines the stages that a new grad nurse goes through in the first 12-18 months of practice. This process includes: doing (learning and frustration), being (growth in skills and competency), and knowing (confidence). This framework aligns with the stressors that new graduate nurses experience, including: shift

schedule, workload, lack of managerial support, difficulty contacting a provider, interpersonal issues, and issues with patient's family (Happell, et al., 2013).

CHAPTER 2: Literature Review

A review of the literature was completed, with this research question in mind: In new graduate nurses, is there a statistically significant lower level of perceived stress in nurses who exercise at least 180 minutes per week, versus those who report 120 minutes or less per week? The following criteria were used for the articles reviewed: published between January, 2012. and July, 2016, scholarly only, and full text available. The study also needed to be completed in the United States, English language only, and the key terms of "stress" and "new graduate nurse". There were 13 articles that met these criteria; the four most applicable articles are discussed here. The other nine articles found within those search criteria had no measurable exercise component involved, were not measuring stress, and/or were not just for new graduate nurses. The four articles included for discussion below best met the research criteria, and are: Intention to Quit, SMART Training, Transition to Practice, and Nurse Athlete Attendees.

Intention to quit

Wu, Fox, Stokes, and Adam (2012) surveyed new nurses, using a descriptive study design, to evaluate workplace stressors and nurses' intention to leave their employer. They recruited new nurses via email, who were recent graduates (≤ 3 years) of either a local baccalaureate nursing program (BSN) or an associate degree nursing program (ADN). The questionnaires consisted of demographic information and the Job Stress Scale for Newly-graduated Nurses, an instrument designed to measure stress on a

6-point Likert scale. There were 52 questions in the tool, and the mean Likert score was used for each participant (reliability and validity established with Chronbach's alpha of 0.95, 2012). They received 154 surveys, a response rate of 38%. Over 93% percent of the respondents were female, and ranged in age from 22-55 years old.

The results of the survey were significant ($p < 0.05$) for correlations between intention to quit and higher levels of stress. They also found that BSN prepared nurses reported more stress, especially as it related to workplace demands and hospital responsibilities. This study had an adequate sample size and represented two different types of nursing graduates. However, this study only recruited new nurses through two local programs, thus there is no evidence that Wu et al.'s findings are broadly applicable.

SMART Training

Chesak, Baghra, Schroeder, Foy, Cutshall, and Sood (2015) performed an experimental study on 40 nurses during their orientation program, looking at the effects of the Stress Management and Resiliency Training (SMART), evaluating the effects of resiliency training on stress in these nurses. The nurses were identified as being either new to their role, or to the institution, but were not necessarily a new graduate nurse. The nurses were surveyed at baseline and 12 weeks after the training to evaluate the nurses perceived levels of stress, mindfulness, anxiety, and resiliency, using the "perceived stress scale, mindfulness attention awareness survey, generalized anxiety 7-item disorder scale, and the Connor-Davidson Resilience Scale" (2015, p. 39). Nurses were excluded who reported any current or recent psychological illness or major physical illness.

The control group received a lecture on stress, which was an existing part of the orientation program. The intervention group received a 90 minute training on SMART,

which included different behaviors to practice, such as gratitude, forgiveness, being intentional and present, and practicing acceptance (Chesak et al.) Also, the interventional group received biweekly emailed handouts on SMART techniques, as well as a follow up face to face meeting four weeks after the initial resiliency intervention.

The findings were analyzed using paired t-tests for statistical significance ($p < 0.05$) for each question on stress. The quantitative findings were not statistically significant between the intervention and control group for measurements of perceived stress, resilience, mindfulness, nor anxiety. However, the researchers reported that qualitative findings did indicate that those who attended the SMART program had less anxiety and were more resilient (2015). The limitations of this study were the small number of participants, the lack of statistical significance in the quantitative findings, and that the researchers made conclusions that were not backed up by the statistical analysis of the data. However, this study is beneficial in understanding that mindfulness and resilience trainings may assist new nurses to reduce stress and increase resilience, based upon their qualitative findings, but further research is needed before this assumption can be supported. Additionally, this study didn't evaluate exercise as an intervention, but was included as it focused on looking for solutions to manage stress in nurses who were new to their role.

Transition to Practice

Spector et al. (2015) recruited 1088 new nurses to participate in a large study, measuring the effectiveness of different hospital orientation programs. There were 105 hospitals in three different states that participated. Each hospital was either assigned to continue their existing orientation program (control group), or were part of the

intervention group, which used the National Council of State Boards of Nursing (NCSBN) “Transition to Practice” (TTP) model (2015). All participating nurses were surveyed at baseline, 6 months, 9 months, and 12 months. The initial question asked by Spector et al. (2015, p. 26) was if the TTP model was more effective than the control group “in terms of safety, competence, stress, job satisfaction, and retention?” In addition the new graduate nurses, their preceptors and facilities also replied to the surveys, as appropriate. Several tools were used: the NCSBN Practice Issues Index, Overall Competence Tool, Specific Competence Tool, a Work Stress Tool devised and validated by NCSBN staff, and the Brayfield and Rothe Index of Job Satisfaction tool. Part of this study was the measurement of stress in new graduate nurses.

The results revealed that none of the demographic differences between hospitals or groups were statistically significant, so they didn’t need to account for differences between them. The nursing responses revealed an average age of 28, 91% identified as female, and 11% stated they were non-white (Spector et al.). Approximately 50% of the nurses initially enrolled completed the study through the 12 month mark (intervention group= 52%; control group= 48%). The control group had fewer patient errors at 6 months, fewer negative practices over the whole time, and decreased stress over time. The TTP group scored higher in patient-centered care, communication, use of technology, and teamwork. There was no statistically significant difference between the groups for specific competencies, turnover, and job satisfaction (Spector et al.). Both groups showed an initial increase in stress from the beginning of the program to the six month mark, but then began to decline. Surprisingly, though, the control group did have a statistically significant lower level of stress than the intervention group over time (p. 32,

Spector et al.). This study's findings are able to be generalized because of its sample size and multi-state study. However, the limitation in this study was that the TTP model didn't demonstrate an improvement in new graduate training, and in some areas, was worse than the control group training.

New Graduate Nurse Conference Attendees

Melnyk, Hrabec, and Szalacha (2013) conducted a descriptive correlational study from a sample of new graduate nurses who were attending a two day conference, designed for new graduate nurses who were interested in improving their health through mental, spiritual, emotional, and physical health aspects (Melnyk et al., 2013). The purpose of their study was to evaluate correlations between different psychosocial and workplace variables and how they affected the new nurses' job satisfaction and lifestyle behaviors. The attendees of this conference were all new graduate nurses at the Ohio State University Wexner Center. All new graduate nurses at this facility were invited to attend the conference, which included participation in this study, and 61 of the 88 new nurses chose to attend. The data were collected using multiple validated tools, measuring: workplace stress, work environment, job satisfaction, anxiety level, personal health, healthy lifestyles beliefs, as well as demographic data (Melnyk et al.).

The demographics of the participants revealed that 54 were female, seven were male, 43 had never married, 17 were currently married, and one participant was divorced or separated. The participants had a mean age of 25.6 years, ranging in age from 22-38 years. Most were Caucasian (n=58) and had their Bachelor's degree (n=49). Their findings noted statistically significant positive correlations between workplace stress and anxiety and depressive symptoms ($p < 0.01$). Healthy lifestyle belief and behaviors, as well

as healthy work environment for self and others had a negative correlation with workplace stress (Melnyk et al.). The strengths of this study are that it identified some areas that can be specifically addressed to decrease workplace stress, such as lifestyle beliefs and behaviors, as well as work environments. One of the limitations, however, is that this study had an internal validity issue, related to selection bias. All of those participating in the study were new nurses who were looking for ways to improve their coping skills.

Synopsis

After reviewing these studies on new graduate nurses, stress is a clear concern for new graduate nurses. However, there are limited data that specifically evaluate methods to reduce stress in new nurses, as noted in the literature review. Some of the studies reported here involved nurses, but were not limited solely to new graduate nurses. Wu et al. (2012) found that higher levels of stress were correlated with intentions to leave their employer, and even nursing. Chesak et al. (2015) attempted a resiliency intervention, geared towards reducing stress in new nurses. However, their quantitative findings showed no statistically significant difference between the intervention and control groups. Spector et al. (2015) performed a multi-state study with new graduate nurses, implementing the NCSBN's recommended Transition To Practice Model. Their findings actually showed increased stress in the group that followed this model, versus the control group. Lastly, Melnyk et al. (2013) studied a group of new nurses attending a conference, geared towards increasing their overall health and wellbeing. Melnyk et al. found that those who believed in and practiced healthy lifestyle behaviors were less likely to have workplace stress. However, none of these studies indicated specific changes that can be

made to address stress in new graduate nurses. Rather, they acknowledged the problem of stress in new nurses, and all identified it as an issue that needs to be addressed. Some of the studies attempted to intervene, but none found specific behaviors that helped, only general lifestyle beliefs and “healthy lifestyle” behaviors (Chesak et al., 2015; Melnyk et al., 2013; Spector et al., 2015; Wu et al., 2012).

This gap needs to be addressed through evidence based research, so that interventions can be tailored to this population. As these studies have shown, increases in stress lead to burnout, attrition, and decreased patient satisfaction (Wu, et al., 2012). Hospital administrators are encouraged to recognize that the mental health of their new nurses is very important. Failure to do so may lead to: drops in job satisfaction rates, increases in attrition, decline in patient satisfaction , and, most importantly, decline in patient care (Happell et al., 2013; Phillips et al., 2014; Wu, et al., 2012). The lack of interventions geared towards addressing stress in new graduate nurses must be addressed, given the fact that there is a nursing shortage that is expected to get worse over the next few decades (Joint Commission for Healthcare Accreditation Organization, 2002). These articles all point to the fact that stress is a definite concern for new nurses, stress is a major factor in the new nurse’s decision to leave their employer, and stress management can help nurses improve their stress level.

The question that needs to be addressed is: how can stress be reduced in new nurses, specifically? This study is designed to determine whether exercise is correlated with stress in new nurses. The findings of this study have the potential to identify one way hospitals can invest in decreasing stress in their nursing workforce. Once specific interventions are found to be helpful in managing stress in new nurses, further

investigational research can be done to continue to measure and study its effectiveness in new graduate nurse populations.

CHAPTER 3: METHODS

Project Design

The project design of this study was a quantitative correlational design. This was analyzed using SPSS software. The results of the study are discussed in chapter 4.

Sample

A convenience sample was recruited through an email database, based upon their recent graduation from a baccalaureate of science in nursing (BSN) program in Southern California. The email was sent to approximately 130 new nurses, who have graduated in the last 18 months. This population all graduated from a traditional BSN program- they had no prior degrees, nor were part of an accelerated degree program. The participants did, however, have the ability to forward the survey on to others in their new graduate programs at their hospitals. All participants were screened for licensure length of time, as well as educational background of their nursing program. Those who did not follow a traditional baccalaureate program were excluded from the results. The desired number of valid, completed questionnaires was a minimum of 30 valid surveys, and 32 completed surveys were obtained.

Instruments

The data for this survey was collected electronically, via Qualtrics. The validated tools used to measure stress were the Perceived Stress Scale (PSS) and the International Physical Activity Questionnaire (IPAQ). Cohen, Kamarck, and Mermelstein (1983) have demonstrated that the PSS tool is well validated, and is available for use without prior

authorization. The IPAQ is also available for use without permission, and has been validated for use in 20 different countries (Bauman et al., 2009).

Ethical Considerations

Ethical considerations were taken into account, to ensure that there were minimal risks to the study participants. The only potential risk was that a participant may be more aware of their stress, as a result of participating in this study. A list of resources in the local region was included at the end of the study, with contact information for those resources, as well as for the lead researcher, if further information was needed.

Procedures

There were several steps taken in the construction of this study. The concept was first explored for current data in research relating to this topic. The theoretical framework was then identified. The tools used to measure stress and exercise were the next key steps in the development of this study. This project was then sent for approval, and was approved by the internal review board (IRB) at both the researcher's institution, as well as the institution that the sample was taken from. The study tools and demographics were then transcribed into Qualtrics. The survey was sent out via email by an employee at the institution where the sample was taken from. This person sent an email to the primary email address on file for all people who had graduated from the university's traditional nursing program in 2015 and 2016. The study contained contact information for the lead researcher, in case any participants had further questions, but the researcher had no access to the personal information of the population being recruited. Both the email, as well as the introductory page on qualtrics, contained informed consent. The results were

then analyzed using SPSS software, in conjunction with the assistance of a statistician from the researcher's institution.

Summary

This study used a quantitative correlational design to evaluate the correlations between stress and exercise in new graduate nurses. The population was a convenience sample, taken from recent BSN graduates of a Southern California university. Risks to the participants were considered to be minimal, and IRB approval was obtained from both the researcher's institution, as well as the institution the sample came from, Point Loma Nazarene University. Statistical analysis was done via SPSS software, and the results are discussed in the next chapter.

CHAPTER 4: RESULTS

The survey was sent out three times via the email list serve of new graduate nurses from a traditional BSN program in Southern California. Initially, there were 25 respondents to the new graduate stress survey, and the results were analyzed. After preliminary analysis of the 25 respondents, it was recommended that additional subjects be recruited to increase sample size. The survey was then sent out a fourth time, and had an additional seven respondents. The results of both the preliminary data, as well as the finalized data, are discussed here, per the recommendations of the statistician involved in this study. Please note the variation of statistically significant differences noted between the two sets of data.

Preliminary Findings

Respondent Demographics

In the initial analysis, there were 25 respondents, all female. Twenty-four graduated from PLNU; one graduated from University of California, Los Angeles (UCLA). Most identified as Caucasian (N=21), with one identifying as African American, and three as Asian. The mean age was 22.46 (range= 21-25, SD= 0.46). The year of graduation was split between 2015 (N=11) and 2016 (N=14). All respondents reported working 12 hour shifts, ranging from 36-40 hours per week (M=36.75, SD= 0.29).

Analysis was done for each demographic, to ensure that there was no statistically significant difference between each group and their PSS score. All results showed no

statistically significant difference between groups, with the exception of hours of work per week. When comparing those who worked 36 hours per week (N=18) versus those who work 40 hours per week (N=3), there was a statistically significant difference noted. Those who worked 40 hours per week (PSS $M=10.3333$) reported a lower level of stress ($p=0.047$) than those who worked 36 hours per week (PSS $M=19.5882$). This incidental finding was surprising, as it showed that those who worked more had a lower perceived level of stress.

PSS Versus Exercise

After verifying the demographics had no statistically significant difference on the PSS score, the null hypothesis was tested, to see if there was a statistically significant lower level of stress in those who exercised at least 180 minutes per week, versus those who did reported less than that. Initial results showed no statistically significant difference. However, when those who reported that they “must” exercise were excluded from the results, there was a statistically significant difference, $F(4,18)=3.382$, $p=0.031$, (see Figure 1). A post-hoc Tukey’s test revealed those who exercise 180-300 minutes per week ($M=11.33$, $SD=3.21$) were shown to have a lower stress level than those who exercise more than 300 minutes per week ($M=24.67$, $SD=4.04$), $p=0.045$.

Other Findings

Other findings in the preliminary results included: 22 of the 25 respondents reported that their work schedule impacted their desired exercise routine. Those who reported exercise at the moderate level were more likely to report exercise at the vigorous level, and those who were seeking medical treatment for anxiety were less likely to report higher amounts of time of moderate or vigorous exercise.

Finalized Study Results

The results of the study were analyzed again, after the additional seven respondents were included in the analysis of the data. This data is discussed in the following section.

Respondent Demographics

There were 32 respondents in the finalized study results. Most were female (N=31), with an age range of 22-25 ($M= 22.66$, $SD=0.7$). The hours worked per week ranged from 36-40 ($M= 36.97$, $SD= 1.54$). The year of graduation was divided between 2015 (N=14) and 2016 (N=18). The race of respondents was mostly Caucasian (N= 27), with one African American and 4 identifying as Asian. Most of the respondents (N=31) worked 12 hour shifts, and one reported working 8 hour shifts.

Analysis was done for each demographic, versus their perceived stress level. All results showed no statistically significant difference between groups, with the exception of hours of work per week. When comparing those who worked 36 hours per week (N=21) versus those who work 40 hours per week (N=5), there was a statistically significant difference noted. Those who worked 40 hours per week (PSS $M= 10.6$) reported a lower level of stress ($p= 0.005$) than those who worked 36 hours per week (PSS $M=19.6667$). This incidental finding shows those who worked more had a lower level of stress.

Hypothesis

The hypothesis, that those who exercise at least 180 minutes per week have a lower perceived level of stress than those who don't, was tested using the Kruskal-Wallis independent samples test. The results varied, depending on how the test was run. When

the distribution of exercise scores were compared to each other, the results stated that the null hypothesis (that there is no difference in PSS score between the different exercise levels) should be rejected ($p= 0.049$). However, when running the test using the means of each exercise group, the null hypothesis couldn't be rejected ($p= 0.16$).

After running these tests, a one-way ANOVA was run, which showed no statistically significant difference ($p=0.05$) between exercise groups and PSS score. If the P value were adjusted to 0.1, however, there was a statistically significant difference between the groups. However, this is not typically an accepted level, as it increases the likelihood of a Type 1 error.

Other Findings

Other findings in this study were: only three respondents stated that their work schedule did not impact their desired exercise routine, those who sought medical treatment for anxiety or stress were more likely to report a higher level of moderate or vigorous exercise (Pearson correlation= 0.477; $P=0.008$), and those who reported a higher level of moderate or vigorous exercise were more likely to report a higher level in the other exercise category, as well. The significance of the impact of work on a new nurse's exercise routine is further discussed in chapter 5, as this is an area for future research or intervention.

Limitations

There were several limitations of this study. The first limitation was the small number of respondents, affecting the ability to see statistically significant findings. Secondly, the preliminary results showed statistically significant differences in perceived stress between those who exercise 180-300 minutes per week and those who exercise

more than 300 minutes per week. The final study results, however, do not represent this with a p value of 0.5. This may be due to a Type 1 error on the initial results, but may also be due to an outlier in the final results. The additional respondents responded within 3 weeks following a tumultuous presidential election, which was also leading into the holiday season. Another limitation is that the exercise category of walking was not reliable to be included in the results, as several respondents put that they walked for 7-10 hours per day, 5-7 days a week. This didn't appear to be accurate to the description of exercise in the instructions for the IPAQ that was given to each respondent. Lastly, because this was an anonymous survey, there was no way to clarify any questions regarding the information submitted, such as this question of walking.

Discussion

Results of this study potentially mitigate stress. Mitigating stress is needed, and is a current gap in literature, as seen in the literature review. As discussed in chapter 2, Wu et al. (2012) addressed the correlation of stress and intention to quit in new nurses. This study aimed to build off the findings of that study, showing a correlation between stress and exercise. Chesak et al. (2015) tried to identify a strategy to reduce stress, but wasn't unique to new graduate nurses, only nurses new to that department. Their findings failed to show a statistically significant difference between the groups who completed the SMART training versus the control group. This study tried to find a correlation that could be used in future research as an intervention for lowering stress in new graduate nurses. While the preliminary data did reveal a statistically significant finding in this study, the small number of participants, and the skew that occurred with additional respondents made it unreliable. Spector et al. (2015) performed a large, multi-state study, attempting

to establish a transition to practice model to ease this transition new nurses go through. However, as discussed in chapter 2, their study not only failed to show an improvement, but actually showed that the intervention group had more stress than the control group (p.32). Melnyk et al. (2013) found that healthy lifestyle and beliefs were correlated with lower stress, but their study population was taken from a group of new nurses attending a conference looking to increase their coping skills, so the findings may not be widely applicable. This study strove to identify a correlation between exercise and stress, in order to lay the groundwork for future interventional research in reducing stress in new graduate nurses. However, the study was unable to reject the null hypothesis in the final study results.

CHAPTER 5: CONCLUSION

Implications For Nursing

While this study failed to show a correlation between exercise and stress, research between exercise and stress has been shown in other populations (Jayakody et al., 2014; Ross & Thomas, 2010). Therefore, it is plausible that exercise can reduce stress in new graduate nurses. This is important information to disseminate into the hands of nurse educators, department leaders, and nurse preceptors. While this study wasn't able to reject the null hypothesis, as discussed previously, the existing research on the benefits of exercise on stress outside of new graduate nurses should translate to this population. Until future research is conducted, every effort should be made by nursing leaders, educators and preceptors to encourage each new graduate nurse to utilize healthy coping mechanisms to reduce stress.

Future Research

Future research with new graduate nurses should focus on finding solutions that clearly and significantly reduce stress in new graduate nurses, with reduced turnover as a byproduct. While some studies have attempted to demonstrate this with interventional studies, none have shown statistically significant differences in stress with new graduate nurses. The study done in this project could be done again with a larger population, to establish, or disprove, a correlation between exercise and perceived levels of stress. Other research can focus on interventional strategies, both internal to the hospital (patient loads and acuities, communication with physicians, nurse bullying, education, etc.) or external factors up to the new nurse. External factors can focus on lifestyle modifications, such as:

diet, exercise, resiliency, sleep, etc. Ways to mitigate stress in new graduate nurses should be the focus of future research in this population.

Conclusion

Stress in new graduate nurses is a clear problem that needs to be addressed. As discussed throughout this paper, the cause is multifactorial, but solutions must be found to ensure that new graduate nurses can thrive in their career. Resiliency training, lifestyle beliefs, and exercise, as studied in this project, have been studied with limited success. However, there were no interventional studies found in the literature review that identified an intervention that lowered stress. The next step to consider for nursing leaders, educators, and preceptors is an interventional study, focusing on resiliency, lifestyle modifications, or exercise. New graduate nurses must be welcomed into the profession, as well as taught how to manage the stress they will encounter, while every effort is made to minimize that stress. Until stress in new graduate nurses is controlled, though, turnover rates will continue to be unacceptably high, with new nurses leaving their vocational calling.

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