

2020

Guiding Nurses to a Healthier Lifestyle

Margaret Yvonne Garcia
Walden University

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Walden University

College of Nursing

This is to certify that the doctoral study by

Margaret Yvonne Garcia

has been found to be complete and satisfactory in all respects,

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Walden University

2020

Abstract
Guiding Nurses to a Healthier Lifestyle
By
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MSN. Western Governors University, Salt Lake City, 2017

BSN, University of Texas Arlington, Arlington, 2015

ADN, LoneStar College, Tomball, 2001

Project Submitted in Partial Fulfillment
Of the Requirements for the Degree of
Doctor of Nursing Practice

Walden University

November 2020

Abstract

Nurses provide continuous patient care around the clock. Nurses who work outside of the 9:00 a.m. to 5:00 p.m. hours are susceptible to fatigue and sleep deprivation that impair their attention to detail, ability to remain focused, information processing, and problem solving. This is especially prevalent among those who work the night shift. Nurses also find that their memory, reaction time, motivation, communication, mood, and empathy are affected with fewer hours of sleep. This project explored the physical and psychological that night shift nurses experience and provides nurses with strategies to improve these symptoms. Nurses were provided with a PowerPoint presentation to promote awareness of the risks of sleep deprivation and how changing their lifestyle would benefit them. In developing this project, Pender's health promotion model was used as the framework for this study. The Karolinska and Epworth Sleepiness Scales were used to measure the prevalence and intensity of night shift nurse sleepiness prior to the development of the educational program on how to manage sleepiness. The education program was presented to 86 nurses with pre intervention//post intervention education surveys that were completed by 62 nurses. Results indicated that participating nurses increased their knowledge of managing strategies for sleepiness. Post-intervention education for the KSS showed that 87.09% of the participants claimed to be very alert to alert, a 35.47% increase from pre-intervention and the ESS showed that 79.03% participants were unlikely to be abnormally sleepy a 32.26% increase from pre-intervention. The findings of this project contribute to positive social change by improving nurses' sleep health and the quality of patient care by making nurses more aware of night shift sleepiness and management strategies.

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Dedication

This project is dedicated to all the night shift nurses who work tirelessly to provide an exceptional patient experience. Their efforts and hard work help to improve outcomes and promote around the clock healing. Thank you for being an integral part of the nursing profession and allowing for continuity of care nightly.

This project is also dedicated to my family. To my husband, Mark Garcia for always being my rock and never letting my self-doubt get in the way of my success. Your love and understanding have allowed me the strength and courage to continue in my education and reach my personal goals for growth and the pursuit to do more. To my children, thank you for understanding my craziness and going along with it. It is my hope that I have taught you the importance of believing in yourself and knowing you can accomplish all things, and that your destiny is yours for the taking. Reach for the stars and dream big. I will always love you to the moon and back.

Finally, to my parents James and Joyce Rodriguez, I thank you for always encouraging me to be the best and allowing me the opportunities to try new things. Your love and understanding will always be unconditional, and I thank you for it.

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Section 1: Nature of the Project

Introduction

Night shift nurses face sleepiness during their shift that can compromise the quality of care provided, jeopardizing both staff safety and their ability to provide appropriate care (Knupp et al., 2018). Sleep is as essential as food and water, and sleep deprivation and fatigue can affect a nurses' physical and mental health. Nurses are often so preoccupied with the well-being of their patients that they may be unaware of the consequences of sleepiness.

In this DNP project, I examined night shift nurses' perceptions of sleepiness and provided strategies to improve their sleep health through educational opportunities via an online power point presentation. I provided these opportunities to five medical-surgical departments in a public hospital in Houston, Texas. I used sleepiness scales to assess the intensity of the nurses' sleepiness. After assessing for sleepiness intensity, I provided an educational program on evidence-based sleep management strategies to the nurses that included a Power Point that described these strategies. I used a pretest and post test was used to evaluate their knowledge gain on how to improve sleep health.

Problem Statement

Nurses falling asleep is an acute problem faced across hospital units. Being a nurse carries with its responsibilities that require concentration, alertness, and agility (Geiger-Brown et al., 2016). Due to the demanding nature of nurses' work, hospital nurses often find themselves taking on many assignments. Despite an Institute of Medicine (IOM) report, "Keeping Patients Safe", (2004), recommending that voluntary overtime be limited, nurses work extra shifts and extended hours, which can result in fatigue that affects their

health and their ability to provide safe care (Alahmadi & Alharbi, 2018). Night shift is anything outside of the normal 9:00a.m. to 5:00p.m. work shift. Zhong, (2018), defined *night shift* as working between 11:00p.m. to 7:00 a.m., although 12- hour shifts of 7:00 p.m. to 7:00 a.m. are common. In her study, the incidence of nursing errors on the night shift was 52% higher than the day shift and there was a higher proportion of harm occurring at night versus day shift. When nurses were asked about contributing factors to errors made, 16% attributed these to lack of sleep. Without proper sleep, nurses are more likely to suffer a needlestick injury or risk potential health issues such as hypertension, obesity, diabetes, depression, and cardiovascular disease. Working long hours can also cause a different type of fatigue in nurses, known as a compassion fatigue. According to a 2014 *Journal of Emergency Nursing* article, “compassion fatigue is described as “the cost of caring” and “an extreme state of tension and preoccupation with individual or cumulative traumas of clients,” whereby persons present a “state of exhaustion and dysfunction, biologically, physiology, and emotionally due to prolonged exposure to compassion stress”(Wentzel& Brysiewicz,2014,pp. 95-97).

I spent more than 17 years of my career, working the night shift and I know firsthand how sleepiness can affect work. Currently I am a nurse manager and find this to be a topic of many conversations. Managers talk about finding staff asleep, mistakes made, staff asking to be reassigned to days, or leaving for a day position in another unit or another organization. It was after these conversations that I began to look at evidence-based interventions that might help to alleviate sleepiness and reduce fatigue in night shift nurses, which has the potential to improve retention on the night shift and improve patient care.

Purpose Statement

Working the night shift dramatically changes sleep patterns. Statistics show that 57% to 83.2% of night shift nurses worldwide report sleep problems that include sleep disturbances, sleep deprivation, and poor sleep quality (Sun, Ji, Zhoue, & Liu, 2019). Individual nurse factors that have been correlated with fatigue, include age, sleep patterns, caffeine intake, and anxiety, potentially from a current or recent life event (Knupp et al., 2018).

The effects of these problems combined, often translate to a decrease in productivity and compromises patient and staff safety (Short, Agostini, Lushington, & Dorrian, 2015). Helping nurses be more aware of sleep problems will help them to develop strategies enabling them to rest better improving their well-being (Geiger-Brown et al., 2016). The purpose of this DNP project was to provide an educational program for future reference that would promote awareness and suggest strategies to manage night shift sleepiness.

Nature of the Doctoral Project

In this project, I explored nurses' perceptions of their sleep behaviors and provided strategies to promote sleep among nurses who work at night. I focused on educating nurses on how to have better sleep health. The gap was that nurses were not aware of the consequences of lack of sleep, both personally and professionally, or of ways to maintain regular sleep patterns. To meet the purpose of this doctoral project, I used three questionnaires. The first questionnaire was a Prediction Survey/Demographic Data sheet. This data sheet gave me important information on the overall sleep health of the individual participant along with their age, sex, and how long they have been working

the night shift. The second questionnaire that I used was the Epworth sleepiness scale (ESS), an eight-item self-administered questionnaire developed to measure average daytime sleepiness (Kaambwa et al., 2018). The third and final questionnaire that I used was the Karolinska Sleepiness Scale (KSS) which assesses the intensity of the sleep problem. The KSS is a self-report sleepiness scale that screens for problematic sleepiness levels (Geiger-Brown et al., 2016; Short et al., 2015). These surveys increased the night shift staff's awareness of how much sleep they are receiving and provided information on the actual amount of sleepiness that each participant felt daily. The ESS and KSS were done as a presurvey and post survey to assess results of the educational tool given to all participants.

Implication for Social Change

Ample research exists regarding night shift nurses and the sleepiness and fatigue they experience (Ribiero-Silva et al., 2016). To improve patient and nurse safety, organizations need to improve assessing nurse sleepiness and fatigue and provide education that can help nurses understand and utilize strategies to improve sleep health (Ribiero-Silva et al., 2016). Nurses have a responsibility to themselves as well as their patients to provide high quality patient care and to minimize workplace hazards that could affect quality patient outcomes. Nurses must learn to advocate for themselves and recognize their own risk for health problems and seek appropriate information on strategies that could mitigate their fatigue and sleepiness. Understanding strategies that can improve sleep and alleviate their sleepiness and fatigue can improve patient care and outcomes, providing a positive social change for patients and nurses.

Significance

The largest group identified in the healthcare workforce are nurses (ANA, 2019). In 2018, the Health Resources and Services Administration (HRSA) documented more than 226,000 registered nurses (RNs) employed in Texas, and approximately 38.4% are night shift nurses (NCBSN,2010). Causes of concern for these night shift nurses are sleep health and its consequences that negatively affect healthcare organizations and outcomes experienced by patients and the community (American Nurses Association (ANA), 2019). It is in the best interest of organizations to promote awareness about poor sleep health and develop strategies to combat it.

Promoting a sleep health education program not only will improve nurses' sleepiness, but will improve nursing practice and nurse satisfaction, and decrease negative patient outcomes due to mistakes. Organizations can expect positive outcomes due to nurses increasing their quality of life leading to an increase in organizational productivity and efficiency.

Summary

In Section 1, I introduced the effects of sleepiness and fatigue on nurses who work the night shift. The purpose of Section1 was to present a clear picture on the strain sleepiness and fatigue puts on nurses' work. The goals that I set for this project included the collection of information that would provide information on sleep behaviors and sleep health as well as a presurvey and post survey that will determine the effectiveness of the education provided.

Section 2: Background and Context

Introduction

In this project, I explored nurses' perceptions of their sleep behaviors and provided strategies to promote sleep among nurses who work at night. I explored the physical and psychological symptoms that night shift nurses experience and provided interventions that could be used to improve these symptoms. *Work-related fatigue* in nurses has been defined as “ a multidimensional state that arises in workers who are exposed to excessive demands through their work tasks, environment and schedules, and that can interfere with workers' physical and cognitive abilities and their ability to function at their normal capacity” (Drake & Steege, 2016, p.E2). Identifying the risk that apply to night nurses and how it affects their quality of life is important to determine what the quality of their work life is and what assistance can be given to alleviate risk factors (Vitale et al.,2017).

In this project, I focused on establishing healthy sleep practices by nursing staff. I provided nurses with information on strategies that they can employ to fall asleep in a timely manner and receive plenty of rest. Nurses who can use these strategies to improve their sleep health will be more effective on their shift and reduce medical errors made in the workplace, as well as increase their personal safety. This issue is important, given that current research shows that nurses report unfavorable situations and the negative effects that fatigue has on their lifestyle and physical, mental and emotional health, in addition to the recurrent errors of low complexity nursing procedures, during their work shift (Lessa Cordeiro et al., 2017).

Conceptual Framework

To implement a practice change, one must find a theoretical framework to use. Pender's Health Promotion Model (2011) presents a framework directed at increasing a

person's level of well-being. This model has not been used in relation to sleep health but can be used to assist the nurse in preventing health disparities that come along with working night shift. Improving health-promoting behaviors (HPB) should improve health function and quality of life by adapting behaviors that promote sleep and improve overall health.

In implementing Pender's Health Promotion Model (HPM), all nurses would be responsible for preventing ill health, rather than merely responding to illness. The model was originally developed to "assist nurses in understanding the major determinants of health behaviors as a basis for behavioral counseling to promote healthy lifestyles" in their patients and, has now also been used as a framework to understand the HPB of nurses (Williams & Costly, 2018, p. 343). Pender's model focuses on three areas: individual characteristics and experiences, behavior-specific cognitions and affect, and behavioral outcomes. The goal of this model is to promote behavioral change, that will result in improved health, enhanced functional ability, and better quality of life (Williams & Costly, 2018). The four assumptions made are:

1. Individuals seek to actively regulate their own behavior.
2. Individuals in all their biopsychosocial complexity, interact with the environment, progressively transforming the environment as well as being transformed over time.
3. Health professionals, such as nurses, constitute a part of the interpersonal environment, which exerts influence on people through their life span.
4. Self-initiated reconfiguration of the person-environment interactive patterns is essential to changing behavior.

In this DNP project, I surveyed nurses on their current sleep health. This information will raise awareness to address the problem of sleepiness and improve workplace conditions, which includes improving the sleep health of night shift nurses. My project was shared with the unit director and the education department at the practicum site, and it was agreed that this topic is often overlooked and should be addressed with the hope that this program of raising awareness and education on sleep health can be adopted through all the hospitals in the system.

Definition of Terms

To have a better understanding of this project, I will define some common terms that I used in this project:

- *Circadian rhythm* is a day/night pattern in many physiological and behavioral variables occurring during a 24hour period, responding to light and darkness in an organism's environment (National Institutes of Health, 2008).
- *Circadian rhythm disorder* is a condition in which a person's sleep/wake schedule is out of sync with the internal circadian clock. This mismatch leads to insomnia and excessive sleepiness (National Institutes of Health, 2008).
- *fatigue* is increased sleepiness, diminished ability to selectively process and retain information, slowed reaction time, and reduced vigilance (Eanes,2015).
- *Insomnia* is a persistent difficulty (for at least 3 months) in falling asleep, or maintaining sleep, or waking up early in the morning and being unable to fall asleep again (American Psychiatric Association, 2013).
- *Shift work* is often interchangeable with night shift work and is a general term

used to describe a job that requires an individual to work other than the standard working hours of mid -morning to late afternoon, Monday through Friday (Brown, Purviance, & Southard,2020).

- *Shift worker* is often interchangeable with *nigh shift worker* and is considered anyone who follows a work schedule that is outside of the typical “9 to 5” business day. Night shift workers usually begin their shift at 6:45 p.m. and end at 7:15 a.m. (Brown et al, 2020).

- *Shift work disorder* is a chronic circadian rhythm sleep disorder characterized by insomnia and excessive sleepiness affecting people whose work hours overlap with the typical sleep period. Symptoms include insomnia when a person is trying to sleep and excessive sleepiness when a person needs to be awake and alert (ANA,2014).

- *Sleep debt* is the accumulated amount of sleep loss from insufficient sleep, regardless of cause in the course of multiple days or weeks (Eanes,2015).

- *Sleep deprivation* is the failure to get enough sleep to feel alert and well rested (Division of Sleep Medicine at Harvard University, n.d.).

- *Sleep inertia* is the grogginess that occurs immediately after awakening that can adversely affect cognitive and psychomotor abilities (Division of Sleep Medicine at Harvard University, n.d.).

- *Sleepiness* is the increased propensity to fall asleep. In contrast to fatigue, sleepiness is specifically due to imbalance in sleep and wake time, disrupted circadian rhythms, or inadequate quantity and quality of sleep (Brunt,2017).

- *Sufficient sleep* is sleep duration that is followed by a spontaneous often

awakening and leaves one feeling refreshed and alert for the day (National Sleep Foundation [NSF],2011).

Often the words '*fatigue*' and *sleepiness* are used interchangeably but are two distinct phenomena (Rogers,2008). *Sleepiness* is defined as the tendency to fall asleep and fatigue is the overwhelming sense of tiredness with the feeling of exhaustion that can lead to impaired physical and/or cognitive functioning ((Division of Sleep Medicine at Harvard University, n.d.). Prolonged fatigue leads to excessive sleepiness with inadequate recovery time that often can lead to decrease work performance with other potential harmful incidents that could occur.

Relevance to Nursing Practice

Hospitals are open 24 hours a day, 7 days a week to meet patient demands and ensure optimal outcomes. It is not uncommon for nurses to work long shifts, rotating shifts, double shifts, evening shifts, and night shifts, resulting in nurse health and safety risks (Brown et al., 2020). There are 2.9 million RNs and 38.4% work night shift in the United States (Bureau of Labor Statistics, 2019; HRSA,2018). This is one indicator why this performance -improvement project could influence creating a positive practice change for nurses by making them more aware and educating them on sleep management strategies. Nurses who sleep better, will naturally feel better. This will empower them to come to work and enjoy their job decreasing turnover and increasing job satisfaction. It will also help to decrease medication and care errors thereby increasing patient safety and patient satisfaction. The overall workforce will also experience an increase in their safety as well decreasing motor vehicle accidents that could injure them or others. The U.S.

Occupational Safety & Health Administration (OSHA) describes a normal work shift as “a work period of no more than 8 consecutive hours during the day, 5 days a week with at least an 8-hour rest (Brown et al., 2020,p.24). Nurses who work 12-hour shifts are working what OSHA considers as an extended shift. These shifts are more physically, mentally, and emotionally taxing and can lead to increased fatigue, stress, and lack of concentration, which often results in heightened risk of error, injuries, and accidents.

Inadequate sleep and resulting fatigue affect the nurse’s ability to deliver optimal patient care. Working fatigued can lead to an increased risk of error and, a decline in short-term and working memory; a reduced ability to learn; a negative effect on divergent thinking, innovation, and insight; increased risk taking behavior; and impaired mood and communication skills (Brunt, 2017; ANA,2014). In addition, fatigue and sleep-deprived nurses are more likely to report clinical decision regret which occurs when their behaviors do not align with professional nursing practice standards or expectations (ANA, 2014). Fatigue also has major implications for the health and safety of RN’s. There is much evidence that links working long hours with night shift to mood disorders, obesity, diabetes, mellitus, metabolic syndrome, cardiovascular disease, cancer, and adverse reproductive outcomes (ANA,2014; Brunt, 2017). Another risk factor that nurses face is driving when drowsy, endangering the lives of both the driver, and other people on the road (ANA, 2014; Brunt, 2017; Centers for Disease Control and Prevention, 2014).

Creating an educational program for nurses can help to mitigate nurse sleepiness and all the negatives that come with it. Sleepiness and fatigue have negative repercussions on nurses’ health as well as patient outcomes (Geiger-Brown et al., 2016),

which made developing this educational tool to promote improved sleep health a worthy cause. This staff educational program will help to mitigate sleepiness and fatigue by promoting strategies that have shown to improve sleep health. Promoting evidence-based practices for sleep health, we will increase awareness in sleep management strategies and improve patient care and nurses well-being.

Literature Review

Considerable evidence addresses the health concerns related to night shift workers. Fatigue and sleep deprivation are only two ailments that affect nurses who work night shift. The literature review will help to illustrate issues of night shift nurses and are organized into sections: Overview of Sleep Health, Problems with Fatigue, Impact of Fatigue, Sleep Deprivation and Related Disorders, Promoting Sleep Health, Financial Implications for Sleep Health and Interventions to Counteract Sleepiness.

Overview of Sleep Health

According to the NSF, 2011, genetic and physiological factors determine the amount of sleep we need and can also be affected by age, gender, and previous sleep amounts. The recommendation by NSF is that individuals should average seven to nine hours of sleep. “Sufficient” sleep is defined as sleep duration that is followed by a spontaneous awakening and leaves one feeling refreshed and alert for the day.

Problems with Fatigue

Sleepiness is defined as the increased propensity to fall asleep in contrast to fatigue, sleepiness is specifically due to imbalance in sleep and wake time, disrupted circadian rhythms, or inadequate quantity and quality of sleep (Brunt,2017). Fatigue has been defined as “ a multidimensional state that arises in workers’ who are exposed to

excessive demands through their work tasks, environment and schedules, and that can interfere with workers' physical and cognitive abilities and their ability to function at their normal capacity" (Drake & Steege, 2016, p. E2).

Fatigue is often viewed as a consequence of sleepiness for 2 weeks or longer (Tang et al., 2016). For the purpose of this project, I considered fatigue an attribute of sleepiness, given that fatigue could be caused by other factors (Ribiero-Silva et al., 2016). Several measurement tools are available to measure sleepiness and fatigue. Two of the most common tools are as follows:

1. The Karolinska Sleepiness Scale (KSS), which measures the prevalence and intensity of night shift nurses' sleepiness (Geiger-Brown et al., 2016; Short et al., 2015)
2. The Epworth Sleepiness Scale (ESS) which was a questionnaire developed to determine the level of daytime sleepiness in individuals (EDS&OSA, n.d.)

The cycle of sleep-wakefulness is a natural part of human life, which includes sleep through the night and wakefulness during the day (Stanojevic, Simic, & Milutinovic, 2016). Our sleep pattern is governed by two basic physiological processes: a) *homeostatic sleep pressure* is referred to the pressure of sleep after consecutive hours of wakefulness and makes us more wakeful as the day progresses; b) the circadian body clock promotes wakefulness at usual times for everyday activities, as well as sleepiness at the usual bedtime (Sudgen, Athanasiou, Darzi, 2012). Thus, the homeostatic system tends to make us sleepier as time goes on, whereas circadian wake-promoting signal prevents us from falling asleep. Consequently, nurses experience misalignment of their

circadian rhythms in relation to their rotating schedules, particularly at night, attempting to work and sleep at the wrong circadian phase. Their homeostatic and circadian sleep systems no longer act synergistically to maintain in the adequate sleep-wake relationship and they have to fight to stay awake during the night, faced with the increase in homeostatic sleep pressure and absence of wake-promoting signal from suprachiasmatic nuclei (Drake,2010).

Effects of Fatigue

Fatigue can jeopardize a nurse's ability to provide safe and effective care to patients and may increase the risk of injury to the nurse (Knupp, Patterson, & Ford,2018). Although little attention has been paid to the possible effects of acute and chronic sleep loss on overall health and well-being of nurses, workplace fatigue has become an important area of concern during the past decade (Eanes,2015). Workplace fatigue is now recognized as a physiologically -based state of impaired performance caused by four factors: a) sleep loss(acute and chronic); b) extended time awake(more than approximately 16 hours); c) working and sleeping at sub-optimal times in the circadian body clock cycle; and d) physical and mental workload (International Civil Aviation Organization, 2016; Gander et al., 2019). Fatigue related impairment resulting from shift work and extended hours can compromise patient care and increase the risk of clinical error (Gander et al., 2019)

Drake et al. (2016), performed a cross-sectional hospital nurse fatigue survey to evaluate a cohort of patient care nurses and their responses to fatigue. The goal of their study was to better understand fatigue measures and patterns of fatigue among hospital

nurses. Researchers reported results in three categories. First, descriptive statistics based on nurses personal, professional, and wellness variables were reported. Second, statistics of patient care nurses for hospital variables and patient care nurse safety practices were provided, and finally, nurse fatigue and adaptation variables were listed. The results rendered three interpretable fatigue profiles with a strong inverse relationship between hospital nurse fatigue profiles and nurse adaptation profiles. The profiles were defined as follows: Profile 1- low fatigue/high recovery (comprising 47% of the sample); Profile 2- high fatigue/low recovery (23%); and Profile 3- moderate fatigue/moderate recovery (30%). Nurses in the high fatigue/low recovery profile had the lowest values for adaptation variables and nurses in the low fatigue/high recovery group had the highest values. Better safety practices were found in the group low fatigue/high recovery profile and the lowest safety practice results in high fatigue/low recovery. There were significant differences in nurse age, wellness measures (sleep, exercise, and depression), resilience, and flourishing indicating an important relationship between a multidimensional view of nurse adaptation and fatigue (Drake et al., 2016). An interesting finding was that the lowest mean age was reported in the high fatigue/ low recovery group supporting the need to target effective countermeasures and risk management interventions for future success of the nursing workforce. To prevent and mitigate nurse fatigue, nurses, especially new and younger nurses, should have educational opportunities to develop effective coping strategies early in their careers (Registered Nurses' Association of Ontario, 2011).

In another cross-sectional secondary data analysis by Lim et al., (2018), nurses were surveyed to examine associations of nursing work environments and health

promoting behaviors with sleep disturbance. The relevance of this survey was to improve night shift nurses' sleep, collegial relations with physicians and promote healthier lifestyles. It was found that nurses with more collegial relations with physicians were significantly less likely to have high levels of sleep disturbance, and those with higher levels of sleep disturbance were significantly more likely to report less stress management and higher health responsibility (Lim et al., 2018). The results of this study suggested that a combined effort from individuals, hospitals and society are necessary to ensure quality sleep among night shift nurses. It was suggested that nurses and physicians needed to acknowledge the needs of each other and maintain professional relationships to keep patients' health and safety as a top priority. From the perspective of organizations, they must identify factors that affect sleep disturbance. Organizations should monitor the environments that night shift nurses work in and make adaptations to reduce sleep disturbances and encourage participation in identified healthcare programs that could help to improve nurses' sleep health.

Sleep Deprivation and Related Disorders

Nurses often suffer from *sleep deprivation*, this is defined as having insufficient sleep that can lead to inadequate alertness, and a decrease in performance and overall health. This is typically contributed to having a reduced total sleep time, chronic partial sleep restriction, or disrupted sleep caused by cortical arousals (Pressman, 2012). According to Pressman, (2012), *sleep deprivation* refers to a reduction in sleep time, or no sleep over one to two days. *Chronic sleep deprivation* is defined as getting less sleep than what is required for optimal functioning on a routine basis.

Insufficient sleep has been associated with cognitive problems, mood swings, poor job performance, increased safety risks, and physiological changes (Wingler & Keys, 2019). According to the National Institutes of Health, most adults need seven to eight hours of sleep, otherwise it predisposes them to multiple health risks that can lead to poor health outcomes (Eanes, 2015). Inadequate sleep and resulting fatigue can affect a nurses' ability to deliver optimal patient care. Working fatigued can lead to an increased risk of error, a decline in short-term and working memory, a reduced ability to learn, a negative impact of divergent thinking, innovation, insight, increased risk taking behavior; and impaired mood and communication skills(Brunt, 2017). In addition, fatigue and sleep-deprived nurses are more likely to report clinical decision regret, which occurs when their behaviors do not align with professional nursing practice standards or expectations (ANA, 2014). Fatigue also has major implication for health and safety that include mental health risks, decrease in cognitive abilities, obesity, diabetes mellitus, cardiovascular disease, gastrointestinal disorders, musculoskeletal injuries, cardiovascular disease, cancer, and adverse reproductive disorders (ANA, 2014). In addition to these medical disorders, driving when drowsy has also been identified as a risk factor that endangers the lives of both the driver and other people on the road.

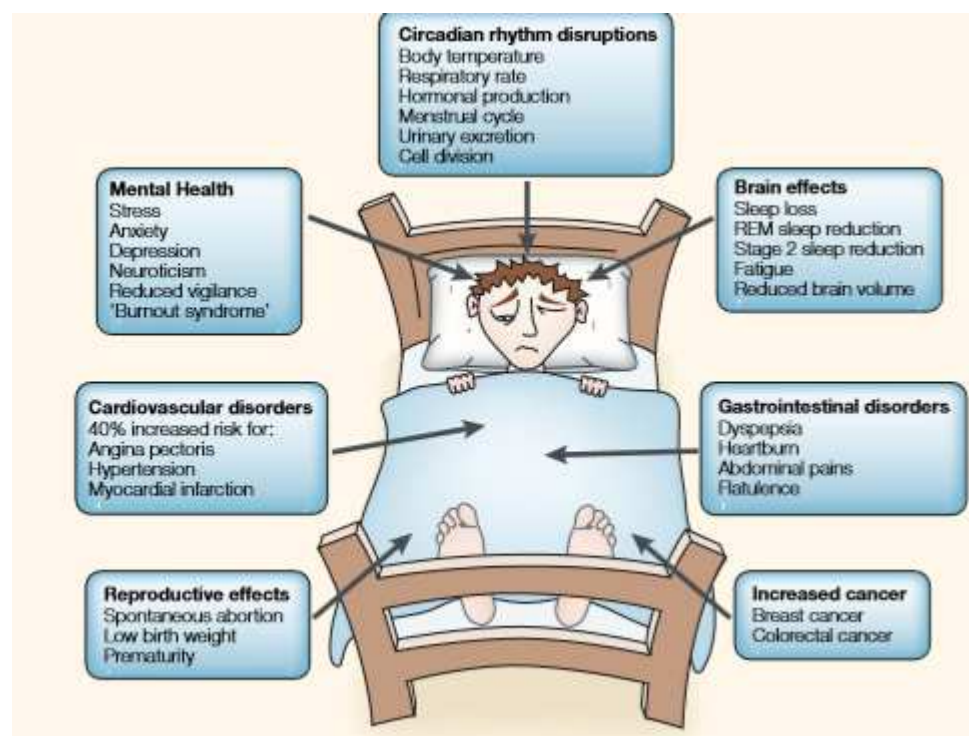


Figure 1 Health problems associated with shift work. Provided by Foster & Wulff (Foster & Wulff, 2005, Figure.3). Reproduced with permission (see Appendix E)

Fatigue, sleep deprivation and other sleep disorders can negatively impact a nurse's personal health and on the job performance (see Figure 1). Consequences of circadian rhythm disturbance include disruption of sleep, decreased vigilance, general feeling of malaise, and decreased mental efficiency (Yu, Somerville, & King, 2019). As a result, night shift nurses are at risk for many harmful outcomes. These include an increased risk for accidents and workplace errors, fatigue and sleepiness, health problems, and disruption to nurses' family and social lives. Often, nurses are unaware of the harm resulting from sleep deprivation. Studies show that cognitive impairment increases, yet nurses fail to respond that their sleepiness or fatigue was increased (Eanes,

2015). These findings suggest that nurses are unable to reliably assess the effects of sleep deprivation and fatigue and underestimate their vulnerabilities.

Cancer. In 2007, the International Agency for Research on Cancer (IARC), classified shift work involving circadian rhythm disruption as a group-2A carcinogen. Cancers that are of concern for night shift workers are breast (women), prostate (men), and colorectal cancers. A reason for the IARC classification could be because of the circadian disruption that pertains to the reduced secretion of the hormone melatonin which is known to have direct and indirect tumor-suppressing properties (Bercz & Jaffe, 2012). Other factors include disturbances of reproductive hormones and the stress-related secretion of cortisol and the resultant depression of immune function (Bercz & Jaffe, 2012)

Cardiovascular Disease (CVD). Research has shown that night-shift workers have a higher risk for cardiovascular events, such as a heart attack, stroke, or other coronary events versus their day shift staff members (Vyas, 2012). In two different studies, Shift workers were estimated to have a 40% increased risk for cardiovascular disease (Bercz & Jaffe, 2012) and in another study 23% more likely to have a heart attack and 5% more likely to suffer from a stroke (Mann, 2012). Some factors that predispose night shift nurses to CVD and the rationale are listed below:

- Obesity is strongly associated with CVD, and many studies have shown that shift workers have a higher prevalence of obesity (Esquirol et al., 2011).

- Increased triglyceride levels are a result of obesity and poor eating habits without proper exercise. Shift workers have shown on lab work to have increased triglyceride levels (Esquirol et al., 2011)
- Increased homocysteine levels and amino acid found in blood, are increased in night shift workers putting them at higher risk for CVD. (Esquirol,2011)
- Metabolic syndrome that includes increased waist size, hypertension, abnormal glucose and lipid values, and inflammatory and thrombotic disorders that places shift workers more at risk for CVD has been reported (Grundy, Brewer, Cleeman, Smith & Lenfant, 2004).
- Hypertension (HTN) is more common in shift workers and found to be more prevalent in those persons who have worked night shift longer. However even with the length of time that a shift worker has been on nights, HTN is a modifiable risk factor that if controlled can decrease the risk of CVD (Esquirol, 2011).
- Smoking is one of the single most modifiable health hazards in America, as it increases a person's risk of not only acquiring CVD, but also predisposes them to cancer, HTN, lung disease, diabetes, and periodontal disease. Night shift workers are more likely to smoke than Day shift workers as a coping mechanism to staying awake (Esquirol et al., 2011).

- Stress predisposes workers to CVD. It is important to recognize staff under stress and help them to reduce their stress levels (Pakieser- Reed, 2013).

The good news is that CVD is reversible by adapting healthy habits. Encouraging participation in Wellness programs provided by organizations and annual screenings are important in combating the fight against CVD.

Cognitive Functioning. Decline in cognitive functioning, especially on the night shift has become a major concern for many healthcare systems. The concern is for the occupational safety of their staff and patients under their care (Barbosa et al., 2015; De Cordova et al., 2016). There is considerable evidence that sleep, learning, and memory are interrelated. Often when there is a lack of sleep, people are unable to focus effectively and therefore cannot learn effectively. Van Dongen and colleagues (2003) and Eanes (2015) examined the effects of insufficient sleep on 48 healthy young adults whose sleep had been restricted to four to six hours a night for 14 days, they found sleep restriction to be associated with a significant decline in sustained reaction time, working memory, and cognitive throughput. These cumulative cognitive deficits were comparable to those seen after two nights' total sleep deprivation.

Diabetes and Obesity. In addition to maintaining normal brain functioning, sleep has an important role in controlling many bodily functions. There is much evidence that supports sleeping fewer than seven hours a day can have an adverse effect on the endocrine system. In addition to poor dietary habits, increased caloric intake, and lack of exercise, sleep loss is now considered a potential risk factor for obesity. For people who sleep fewer than six hours in a 24-hour period, they are more likely to have a higher body

mass index (BMI) (Elberly & Feldman, 2010; Knutson, 2012; Eanes, 2015). Spaeth and colleagues(2013) examined the effects of sleep restriction on weight gain, daily caloric intake, and meal timing in 225 healthy adults and found that sleep restriction was associated with weight gain In a cross-sectional secondary analysis of data from a survey of 2,103 female nurses suggests that irregular shifts, working extended hours, poor eating habits, and sleep insufficiency were related to obesity among nurses (Han,2011).

There has been a consensus that sleep restriction and adiposity are connected and influenced by eating behaviors and environmental conditions, Leptin is an appetite suppressing hormone secreted by fat tissue and ghrelin is an appetite stimulating hormone released from the stomach. Leptin and ghrelin act together to control appetite by regulating hunger and satiety (Knutson, 2007). Sleep loss alters the ability of leptin and ghrelin to signal the body what its caloric need is. With the reduction of serum leptin, there is an increase in self-reported hunger and is often associated with sleeping fewer than seven hours daily.

There has been an observable decline among Americans in average sleep times and an alarming rise in diabetes (Eanes, 2015). Obesity is a major risk factor for type 2 diabetes, and many researchers believe that sleep restriction may be impairing glucose metabolism increasing the risk of diabetes. A causal effect has been noticed between sleep deprivation, changes in glucose metabolism, and hormone levels that may be a contributing factor to obesity and diabetes. Besides the effect on leptin and ghrelin, chronic sleep deprivation has been associated with increased levels of insulin and insulin resistance. Spiegel and colleagues (2004), did a study that assigned 11 healthy young men to 16 consecutive nights of sleep, starting with three nights of eight hours (11pm-7

am; baseline), followed by six nights of four hours (1am to 5 AM; sleep restriction), and finally seven nights of 12 hours (9pm to 9 am; sleep extension), sleep debt reduced glucose tolerance and acute insulin response to IV glucose by roughly 30%. This study suggest that chronic sleep loss may lead to persistent insulin resistance, resulting in excess plasma glucose and triglycerides, which ultimately increase the risk of both diabetes and heart disease.

Gastrointestinal Disorders. Chronic disruption of biological rhythms due to shift work has been associated with the development of serious gastrointestinal disease. The results of a study conducted in Michigan showed significantly higher prevalence of inflammatory bowel disease in nurses working rotating night shifts (Nojkov, Rubenstein, Chey, Hoogerwerf,2010). Night nurses also have a higher incidence of peptic ulcers and disorders, such as constipation and diarrhea (Clupepper,2010).

Mental Health. Daily nurses must deal with multiple stressors while at work, but night shift nurses experience unique stressors related to the time of their shift. Night shift nurses are often faced with work stressors as well as social stressors. Some of these stressors identified include:

- Lack of availability of help means that there are less people available to help with tasks such as lifting and bathing. Units are often staffed with lower nurse ratios at night and with less-experienced people compared to day shift. This means there are fewer people to turn to for expert advice or psychological support when needed.
- Reduced Staffing at night causes nurses to have longer waiting times for equipment, supplies and medications.

- Expert Advice at night is usually minimal requiring nurses to care for critically ill patients with minimal physician support.
- Work- Life Balance is hard to find because nurses recognize that while they are hard at work, their families and friends are at home enjoying family time and sleeping at normal hours. Nurses must find a balance when they get home and are ready to sleep, because their families and friends are ready to get up and start a normal day, often forgetting that they need to rest.
- Social Connections are hard to make leaving nurses feeling remorse for having to miss engagements such as baseball games, parent-teacher conferences, family dinners or even holidays. Nurses always feel guilty when missing these functions and feel left out causing them to have mild depression or anxiety.
- Mental Health stressors related with sleep deprivation can lead to unipolar depression which has been defined as having low self -worth, sadness, lack of interest or pleasure in normally enjoyable activities that can impair relationships and everyday functioning (Wiebe,Cassoff & Gruber,2012; Pakieser-Reed,2013).

Motor Vehicular injuries and sleep loss. A descriptive study in which the sleep, sleepiness, fatigue, and cognitive-behavioral performance of 80 RNs were measured over three consecutive 12- hour shifts, found that nurses accumulate a considerable sleep debt while working successive 12-hour shifts (Geiger,2012) Fatigue increase sleepiness, and diminishes ability to selectively process and retain information, slows reaction time, and

reduces vigilance that can increase the risk of human error, which can be costly in terms of personal health and well-being. Drowsy driving is well known to be a major cause of motor vehicle accidents (MVA) and subsequent fatalities and nonfatal injuries. In 1996, Novak and Auvil-Novak, interviewed 45 ICU nurses and found that 43 (95.5%) had been involved in at least one accident or near accident while driving home from work (Eanes,2015). In a 2007 survey of 895 hospital staff nurses, 596 (66.6%) reported having driven while drowsy at least once during the 28-day study period and 30 (3.4%) said they drove while drowsy following every shift they worked (Scott et al.,2007). There are many studies that show nurses who work more than 60 hours per week, irregular shifts, or at night have a higher risk of being involved in an MVA or having a near miss.

Musculoskeletal injuries and sleep loss. In 2011, the ANA did a health and Safety survey in which 4,614 RNs responded. In this survey,53% reported working mandatory and unplanned overtime, 55% said they worked more than 40 hours per week, and 62% reported having disabling work-related musculoskeletal injuries (ANA,2011). Using a longitudinal survey in which data were collected in three waves or rounds, Trinkoff and colleagues' (2006), questioned 2,617 RNs about work schedule characteristics and musculoskeletal disorders. They found that nurses who worked long hours or mandatory overtime, were on call, or worked on days they had planned to be off were at a significantly higher risk for work-related musculoskeletal injury, with low back pain or low back injury being the most frequently reported(Trinkoff et al., 2006). De Castro and colleagues (2010) in a cross-sectional study of 655 RNs that also suggested that non-day shifts, and mandatory overtime were significantly associated with occupational injury and illness.

Reproductive Health. Night shift nurses often experience fertility issues due to menstrual irregularities. Shift work has also been linked to reproductive concerns, including low birth weight, preterm births, and infertility related to stress (Chung et al., 2009). A study of 68 night -shift nurses of childbearing age, showed that 53% experienced change in their menstrual cycles along with increased pain (Bercz & Jaffe,2012). One European study of 6,630 working women ages 25-44 years old revealed that working night shift was associated with subfecundity, which was defined as requiring more than 9.5 months of unprotected intercourse to obtain pregnancy (Bercz & Jaffe,2012).

Financial Implications of Sleep Health

In addition to the health and safety risks, the effects of fatigue and sleepiness have financial ramifications. Direct costs to employers include increases in health care costs, worker's compensation claims, early disability costs, recruitment and training costs, and legal fees (ANA,2014). Circadian, a shift work consulting company, estimates fatigue - related accidents, lost productivity, and health care expenses costs U.S. employers \$116.5 billion per year (Sirois,2007) Shift work and long work hours are linked to a wide range of health risks which can lead to more sick related absences. Employers are also at risk for loss of nurses because they become disabled and unable to work (Tuchesen, Christensen, Lund, & Feveile, 2008). This can lead to higher insurance and workers compensation rates. Failure to retain nurses increases costs for healthcare organizations: shift work and long work hours were major reasons for leaving the nursing profession in a study by Peter D. Hart Research Associates (2001).

Promoting Sleep Health

There are many strategies in trying to reduce the risk from sleep deprivation and fatigue. Ensuring that nurses get enough quality sleep is a top priority and educating nurses with sleep health strategies will assist them in reaching this goal. The practice of good sleep hygiene will help nurses to maintain a healthier lifestyle and incorporate learned sleep habits.

We teach our nurses many lessons throughout their career, but there is never any education on improving sleep health for night shift nurses. The proposed educational program and resources provided nurses should be able to make a lifestyle change or modify their lifestyle for improved outcomes.

Proposed Interventions in Combatting Sleepiness and Fatigue

Twelve -hour shifts remain an accepted norm with nursing and health care organizations, despite a growing body of evidence that long or consecutive shifts, reduced opportunities for quality of sleep, and minimal recuperation time can have substantial adverse effects on the physical, cognitive, and emotional well-being of nurses and may subsequently reduce the quality of patient care (Geiger-Brown,2012; Geiger-Brown & Trinkoff,2010). There are a variety of practices that can help nurses maximize the time they do spend sleeping, improving their fatigue and sleepiness levels. The ANA Enterprise Healthy Nurse, Healthy Nation Grand Challenge was launched in 2017. The aim of this challenge was to improve the nation's health by supporting nurses as they pursue their personal wellness. Adequate rest was the key to this effort and night shift nurses faced the greatest obstacles in this challenge (Brown et al., 2020).

The overall goal for night shift nurses who suffer from sleep deprivation and fatigue is to decrease the impact of shift work on their body. The practice of good sleep hygiene involves avoiding the intake of alcohol and caffeine prior to going to bed and creating an environment that is conducive to sleep. Nurses must also recognize their limitations and acknowledge when they need breaks, however many nurses will regularly sacrifice their breaks and meal periods to care for their patients or ensure that they complete task to be able to leave the next morning at an appropriate time (Roger, Hwang, & Scott, 2004). There have been studies that suggest countermeasures to reduce fatigue and the purpose of this project is to educate nurses on these countermeasures to improve their sleep health.

Exercise. In short periods can help to increase alertness if it is not done before going to bed (Caruso & Hitchcock,2010). Sleep experts recommend that exercise be completed at least three hours before sleep begins, because body temperature becomes elevated during exercise and can take as long as six hours to drop. Cooler body temperatures are needed to help fall asleep. It is also recommended that employees take advantage of employee wellness programs and stress-management tools, healthy nutrition and physical activity should be done (Brown et al., 2020). Other potential herbal remedies include root of valerian, chamomile, passionflower, hops, ginseng, lemon balm, and skullcap (Ratini,2012).

Herbal and Alternative Therapies. Can be helpful in falling asleep. Melatonin is the major hormone responsible for circadian rhythm regulation. It regulates sleepiness, as melatonin at night is generally higher and lower during the day. The reason melatonin is so low during the day is because light suppresses melatonin secretion (Chung et al.,

2009). Melatonin could help with sleep but should be used with caution by women as it can have an adverse effect on menstrual cycles as well as the differentiation of osteoblasts (Buscemi, Vandermeer, & Hooten,2006).

Lighting. Night shift work forces individuals to work at a time when the circadian sleep drive is high and to sleep when wakefulness is high (Griepentrog et al., 2018). This misalignment reduces the amount of daytime sleep which leads to impaired nighttime alertness (Chapdelaine, Paquet, & Dumont,2012). Light suppresses melatonin production and initiates wakefulness and alertness, which often is a precursor to why night shift nurses have a hard time falling asleep in the morning (Kayumov et al., 2005). This is the reverse when nurses are placed in dim areas while at work causing sleepiness (Griepentrog et al.,2018). Shiftwork causes a conflict of the circadian homeostasis causing sleep disorders that lead to sleep deprivation and fatigue. A study with ICU nurses showed that using bright light in their working environment improved their nurse wakefulness, but resulted in more errors (Griepentrog et al., 2018). In this study however, night shift workers reported that after having period of high intensity light, they felt more alert and well rested after sleep (Jensen et al., 2016). In a second cohort in this study, nurses underwent bright light exposure followed by light attenuation in the morning using sunglasses. This group experienced improved post-shift daytime sleep suggesting that workers had improved sleep following bright light exposure while at work and attenuating light the following morning prior to daytime sleep (Griepentrog et al., 2018). Other suggestions to fall asleep would be to keep the room temperature cooler, black out shades to prevent sunlight from entering the room, and removing all

electronics that could be distracting that would prevent sleep (Touitou, Reinberg, & Touitou, 2017).

Naps. Before and during the shift may help to increase alertness and vigor. Naps do not make up for inadequate sleep, but a short 20-30minute nap could improve alertness and performance (National Sleep Foundation, 2011). Halm, (2018), reviewed ten original research studies that examined the effects of naps on hospital nurses. These studies included three qualitative, one participatory action, two descriptive, one quasi-experimental, two randomized controlled trials, and one systematic review. The quantitative and qualitative studies validated that strategic naps rejuvenate nurses (Halm, 2018). For those nurses who could not nap the finding was that from 4 am to 6 am was when they suffered most from drowsiness. In all the studies, nappers reported feeling “energized and refreshed and sleep inertia occurred less often (Geiger-Brown et al., 2016; Fallis, Mc Millan, Edwards, 2011). Naps that occurred before 4 a.m. promoted better sleep quality and were associated with greater physiological benefit and psychomotor performance, naps should not last longer than hour to prevent sleep inertia (Fallis, Mcmillan, Edwards, 2011). The recommendation from Geiger-Brown (2016), was that naps should be offered to nurses with (1) self-perceived sleepiness or shiftwork sleep disorders, (2) commutes more than 20-minutes or on rural roads, and (3) rotating shift, especially those working their first shift or more than 3 in a row. Nurses should be educated on napping, including taking naps before working a night shift or a prolonged stretch of nights.

Nutrition. People who do not get enough sleep are found to have a decrease in leptin levels that will cause an increase in appetites (National Sleep Foundation, 2011).

Having a healthy diet with three balanced meals can help fight fatigue. According to Meyer (2009), skipped meals causes the body to go into fasting mode using less efficient energy sources. Missing a meal can compromise glucose levels, causing them to drop using less efficient energy sources and requiring the body to use protein stores and fats in the form of ketone bodies. When ketosis sets in, it will cause fatigue, low blood pressure, and nausea causing decision making skills to be impaired. Some suggestions for good eating habits that will help to promote healthy sleep and decrease fatigue include:

1. Eat carbohydrates in the morning to help promote sleep.
2. Eat protein in the evening, especially on nights worked to provide extra energy and stimulate alertness.
3. Eat meals that are easily digested. It is suggested to eat small frequent meals instead of one large one.
4. Eat foods that are easily digested such as yogurt and soup (Wurtman,2010).

Social Drugs. Often nurses turn to legal stimulants such as caffeine and nicotine to help avoid sleepiness and fatigue.

Stress Management. There are many different methods of stress management. Acupuncture and meditation are two common methods that are used to treat insomnia (Ratini,2012). Behavioral changes can also help manage stress and help with a healthier lifestyle.

Local Background and Context

As a former night nurse manager in a large inner -city hospital, I was concerned when I would round on the units and see how tired the staff was and could see the fatigue particularly with seasoned experienced nurses. Sleeping in clinical areas was against

hospital policy and warranted disciplinary action, that could possibly lead to termination. It became very apparent that some type of intervention was needed to help the nurses combat their sleepiness and build better coping mechanisms to ensure their continued success in the nursing profession.

Considering night shift nurses are needed around the world for continuity of care, it is easy to assume that all hospitals face the same dilemmas with nurse sleepiness and fatigue. It stands to reason that using interventions suggested by previous studies would produce positive outcomes and perhaps new interventions would be discovered in the process. Many studies contribute work related fatigue to adverse patient outcomes and poor individual nursing outcomes (Bae & Fabry, 2014; Trinkoff et al., 2011). The ANA's position statement emphasizes the importance of promoting fatigue management training or education following Provision 5.2 of the *ANA Code of Ethics for Nurses with Interpretive Statements* (ANA, n.d.). This statement states "Nurses should model the same health maintenance and health promotion measures that they teach and research, obtain health care when needed, and avoid taking unnecessary risks to health or safety in the course of their professional and personal activities" (ANA, 2015, p.32).

This practicum site is a Magnet designated hospital and therefore is constantly encouraging the nursing staff and their leaders to use evidence-based practice (EBP) to their advantage to help enlighten and educate the staff. Addressing the problem of nurse sleepiness and fatigue, and implementing an educational program with interventions, will align with quality improvement initiatives the hospital strives to maintain.

Role of the DNP Student

The National League for Nursing (NLN) supports doctoral preparation of nurses and believe they are in a better position to advance the science of nursing education, both by conducting original research and by translating and applying research in the practice environment. The DNP student's role in this educational program is to promote an evidence-based approach to solving the problem of night shift nurse's sleepiness and fatigue. The DNP student's role at this hospital will be that of project manager and educator. I, therefore researched and developed a program to be presented to nurses working on the night shift in selected units with the hope that it will be offered hospital wide to all night nurses and nurses who rotate shifts. This educational tool will be presented to the organization for continued use in preventing nurse fatigue. I also worked as one of the nurse managers in this inner-city hospital and have seen staff struggling with the difficulty of staying awake. Many measures were reviewed and chosen to be incorporated into this educational program based on this personal experience. It is my firm belief that educating the staff will have positive outcomes for patients as well as staff. The role of this DNP student is to translate evidence-based recommendations into practice and enhance the sleep health of night shift nurses in the process.

Role of the Project Team

In this section, I will describe the roles of all team members, which consisted of my preceptor, nurse educator, and the assistant chief nursing officer. I shared with them my idea for an educational program to help combat nurse sleepiness and fatigue and the provided input regarding the educational content and feedback on feasibility of the project. Other team members included members from the organizations research

department who authorized the project to commence and who will validate the content of the in-service educational program.

Summary

In section 2, I discussed the relevance of the proposed DNP project to nursing practice. The conceptual framework used to this project was shared along with a literature review defining the problem and showing the impact working at night has on night shift nurses. The literature review pertained to nurse sleepiness and fatigue and the impact it has on their professional lives as well as their personal lives and ways it could be mitigated to improve their overall sleep health. The contextual background was reviewed along with roles of the different team members and their importance in completing this project successfully.

Section 3: Collection and Analysis of Evidence

Introduction

The purpose of this project was to address the sleep health of nurses who work the night shift as it is an acute problem faced in many hospital units across the country. A gap exists on available resources tailored to night shift nurses that could help improve their sleep health. Night shift nurses are usually newly graduated nurses who typically receive little to no formal education about good sleep patterns or the importance of sleep in maintaining adequate health and mental health. Nurse education often does not incorporate content on the impact of fatigue in nursing practice, daily activities, and the way they manage stressors in their lives. Nurses are often not enlightened regarding fatigue awareness is and strategies to combat this fatigue in the workplace. With this

educational project, nurses should have a better idea on how to manage their own fatigue and continue to provide safe and effective care.

Practice-Focused Question

The practice focused question for this project was “Will an educational program on sleep health improve night nurses’ knowledge and awareness on the importance of managing workplace fatigue? The purpose of this DNP project was to provide an educational program through a PowerPoint for future reference. This PowerPoint will promote awareness and suggest strategies to manage night shift sleepiness. The strategies that are provided in this project will help nurses manage their fatigue in a more effective manner and establish positive working conditions to help them be successful and safe. Nurses have a professional responsibility to recognize and manage their own fatigue and to provide safe care and organization have the responsibility to provide these resources.

Sources of Evidence

I conducted my research through an electronic search of the literature using multiple databases: Medline, PubMed, CINAHL, Cochrane Database of Systematic Review, Google Scholar, Ovid, Wiley, EBSCO, and the Walden University library. Key words used in the search were *night shift*, *night nurses*, *nurse fatigue*, *night shift nursing and fatigue*, *sleepiness in night shift nurses*, *sleep deprivation in night shift*, *sleep deprivation in night shift nurses*, *problems of shift workers*, and *measures to help night shift nurses*. To utilize all available research, I used Boolean string with terms: *fatigue of nurses*, *problems of night shift nurses*, *sleepiness of nurses*, and *combatting sleepiness in*

night nurses and countermeasures for sleepiness. I used primary and classic research along with material current within the last 10 years.

Analysis and Synthesis

I analyzed and reported data using descriptive statistics displayed in tables and graphs as appropriate. I compared knowledge of sleep health before and after providing an educational PowerPoint. The average scores and individual question results of the ESS on average daytime sleepiness, and the KSS on the risk level of sleepiness in night shift nurses will be presented in tabular form.

Ethical Considerations

This is a minimal risk project that will not require physical encounters in keeping with Walden University's mandate on social distancing. Approvals will be sought from the practicum site and the Institutional Review board at Walden University prior to beginning the project.

Participants were contacted via email describing the purpose of the project with a PowerPoint attached of the educational project. Participants were asked to pick up a packet at their charge nurse's office with surveys enclosed. They were directed in the email to drop off packet with surveys within a week of initial email. A separate email was sent out two weeks later asking participants to pick up another survey packet to measure how well intervention from the educational tool helped. This process allowed for social distancing methods and helped to maintain no contact as recommended by Walden University.

Project Design and Methods

Following approval, I conducted the project in two phases with no physical contact being made. In Phase I, I reached participants by email with the purpose of the project (see Appendix A) and PowerPoint (see Appendix H). In Phase II, participants picked up a packet from the charge nurse office that included a predication survey with demographic data (see Appendix B), an anonymous questionnaire that includes the ESS (see Appendix C) , which is an eight-item self-administered questionnaire developed to measure average daytime sleepiness, and the KSS (see Appendix D), a validated tool to measure the risk level of sleepiness in night shift nurse. I obtained permission to use these tools for this doctoral project (see Appendix F, and Appendix G). I posted project information the week prior to the email going out by manager on the unit on huddle board and was advertised for one week during huddle time, which took place prior to the beginning of each shift. Participants did not receive compensation based on participation, and nonparticipation did not have any effect on their employment. All information gathered was kept confidential and anonymous. At the end of a 2 week period, I sent another email asking participants to pick up another survey packet with post education surveys to see results of strategies provided. All information was kept anonymous and confidential.

Population and Sampling

I conducted a convenience sampling with participants from this inner-city hospital in Houston, Texas. The participants were from all medical-surgical units that consists of 32 telemetry beds, 32 observation beds, 31 orthopedic beds, 32 surgical beds, and 25 overflow beds. The convenience sample of registered nurses consisted of 86 nurses, including a mix of male and female nurses with varying years of experience.

Summary

My goal for this project was to understand nurses' knowledge on sleep health and provide evidence-based strategies to help them make healthy changes in their lifestyles. The overall desired outcome of the project was to have a lasting educational program that could be utilized by the organization and others to educate nurses coming to the night shift. The priority would be to decrease errors in the workplace, increase nurse retention, improve on nurse and patient safety, and increase employee satisfaction.

Section 4: Findings and Recommendations

Introduction

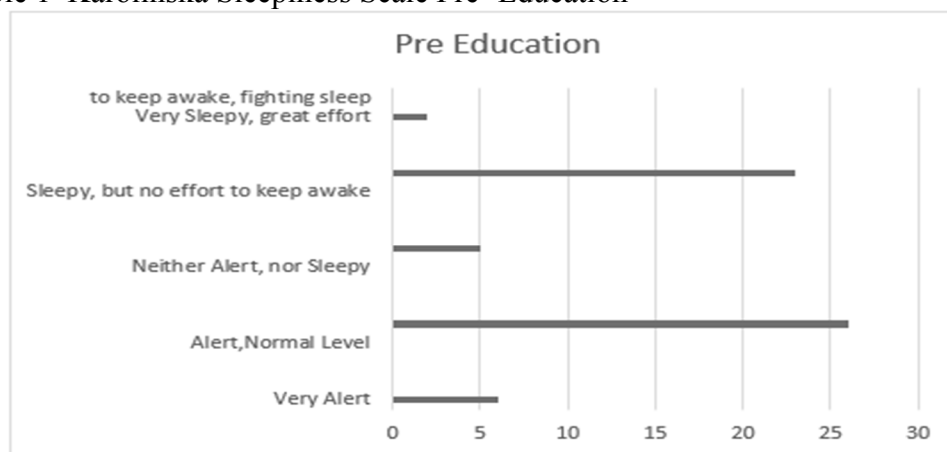
My aim for this project was to assess the prevalence and intensity of night shift nurse sleepiness at a public hospital using the validated KSS and ESS. In addition to these two surveys, I conducted a Prediction Survey/Demographic Data to ascertain the efficacy of the evidence-based education program in promoting sleepiness moderating management strategies to improve night shift nurses' sleepiness. Section 4 contains the results of the surveys that screened for the prevalence of night shift nurses' sleep problems. The next step in the project was to implement staff education interventions to help in the management of sleepiness. In Section 4, I will provide data analysis and results along with the strengths and limitations of the project.

KSS Results

All RNs working the night shift from 7:00p.m. to 7:00 a.m. (N = 86) were invited to participate in the project. All 86 nurses met the inclusion criteria for the project and there was a participation rate of 72% with 62 participants (n = 62). Table 1 represents the KSS survey pre results for the 62night shift RNs in the med-surg units. Six RN's (9.68%)

scored their sleepiness as *Very Alert*, 26 RN's (41.94%) stated they were *Alert, Normal level*, Five RN's (8.06%) responded to being *Neither Alert, nor Sleepy*, 23 RN's (37.09%) responded to be *Sleepy, but no effort to keep awake*, two RN's (3.23%) responded that they were *Very Sleepy, great effort to keep awake, fighting sleep*. The nurses who responded to being sleepy to very sleepy are considered by the KSS as having a problematic and disruptive sleep behavior.

Table 1 Karolinska Sleepiness Scale Pre- Education



Epworth Sleepiness Scale

The ESS had responses from 62 RNs (n = 62). I used the ESS to measure the general level of daytime sleepiness. The respondents rated their propensity to doze or fall asleep for eight common daily activities. Those activities included sitting and reading, watching television, sitting inactive in a public place, as a passenger in a car for an hour without a break, lying down to rest in the afternoon when circumstances permit, sitting and talking to someone, sitting quietly after a lunch without alcohol, and in a car while stopped for a few minutes in traffic. This survey totals the score from all the questions to determine sleep health. The total scores have the following interpretation: 0-7: It is

unlikely that you are abnormally sleepy; 8-9: You have an average amount of daytime sleepiness; 10-15: You may be excessively sleepy depending on the situation and may want to seek medical attention; and 16-24: You are excessively sleepy and should consider seeking medical attention. In the pre-intervention survey, 46.77% of the respondents showed that they were unlikely to be abnormally sleepy, and 38.70% reported being excessively sleepy depending on the situation and may want to consider seeking medical attention, whereas 14.52% reported being excessively sleepy and should seek medical attention. The questions that respondents indicated that they would have a high chance of dozing off included *Sitting and Reading*, *Watching Television*, *As a passenger in a car for an hour without a break*, and *Lying down to rest in the afternoon when circumstances permit*.

Table 2 Epworth Sleepiness Scale Pre-Intervention Education

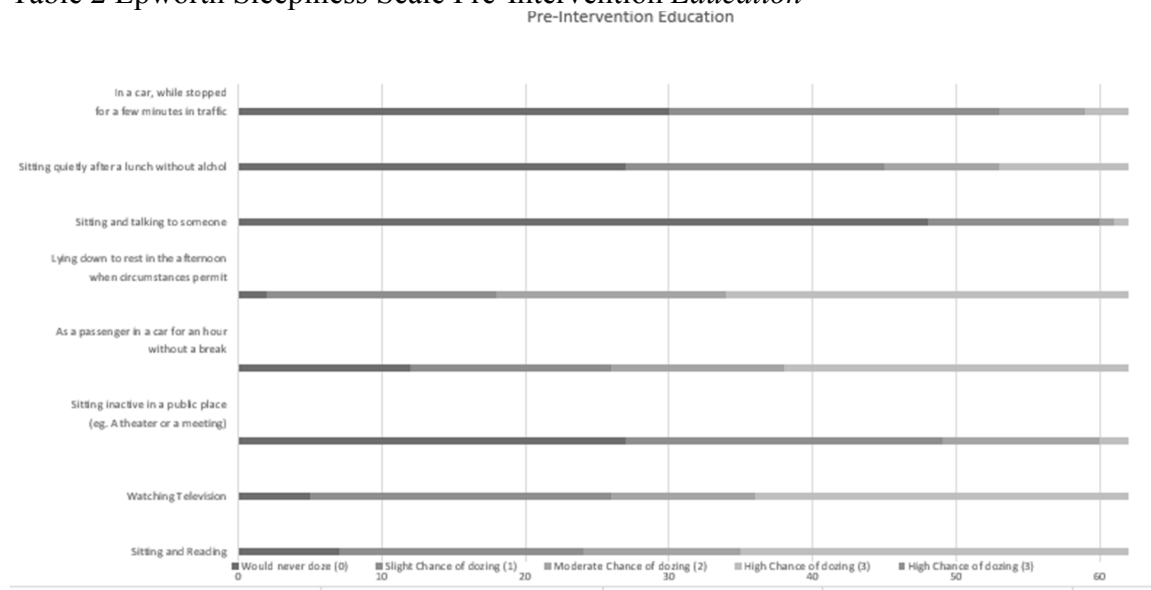


Table 3 Interpreting Epworth Sleepiness Scale Scores

Interpreting Epworth Sleepiness Scale Scores			
	Normal 0-10	EDS* >10	High Level of EDS* >16
Pre- Education	29	24	9
*Excessive Daytime Sleepiness			

Prediction Survey and Demographic Data

I used a prediction survey and demographic data sheet (Appendix B) to survey all participants to make sure they met the inclusion criteria of working night shift. It also gave information such as how long each participant had been working night shift (Table 2 4), along with ages (Table 5) and gender of each participant (Table 6). The purpose of the prediction survey was to have an idea of how the participants sleep was impacted while working a non-standard shift and how their sleep was affected after a work break of at least a week. In this initial data, most participants were female with 40% of the participants falling in the age group of 40-49 years and working night shift for 5 years or longer. In Table 7, many of the participants showed having either a slight to moderate problem with their sleep and well-being during their work time. In this survey 85.48% of RNs responded to having at least 1 week off in the past year. The responses reflected that their sleep health was better during the break than prior to the break. This single survey helped with verifying the need for an education program to help night nurses understand how to get better sleep.

Table 4 Time Working Non -Standard Shift

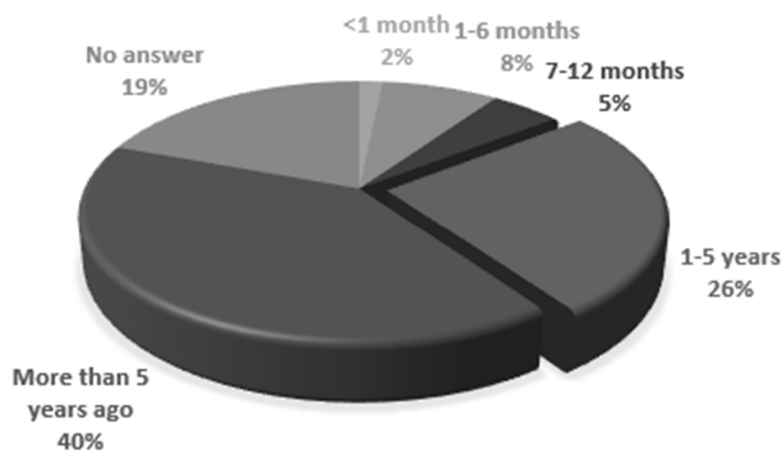
TIME WORKING NON-STANDARD SHIFT

Table 5 Age Groups

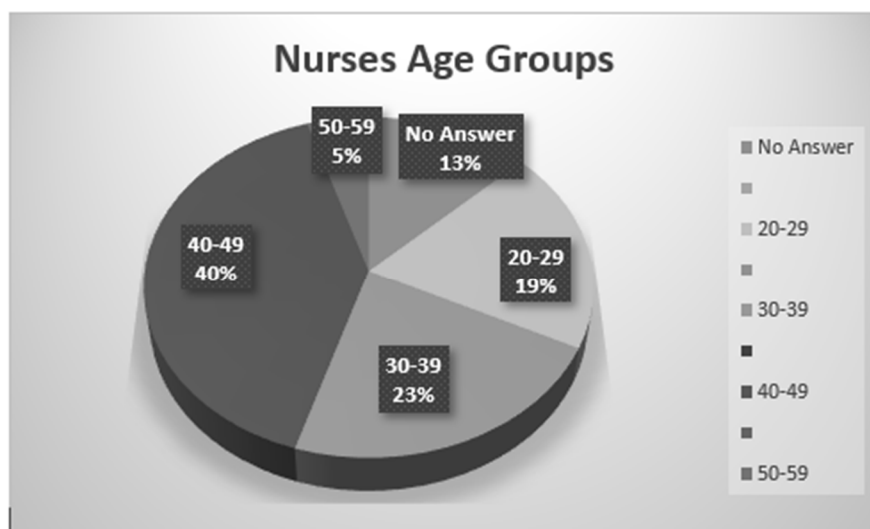


Table 6 Gender

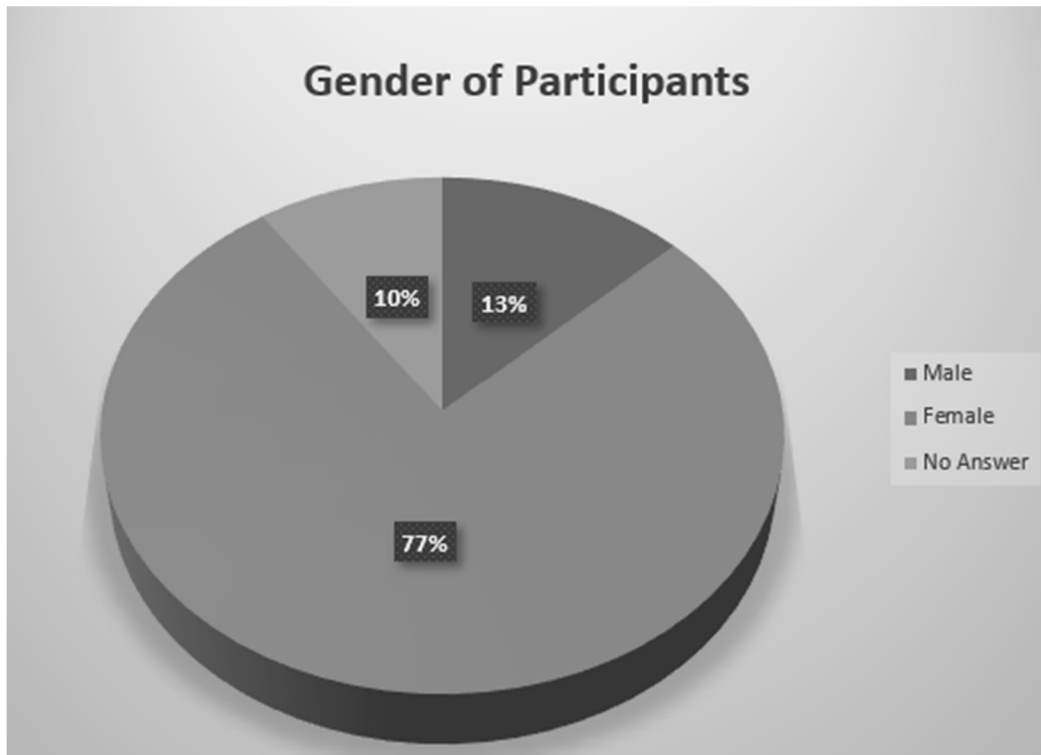


Table 7 Prediction Survey

SECTION B						
1. In the past month, while working non-standard shifts, your overall amount of sleep was						
Sufficient	4 Slightly insufficient	20	Somewhat insufficient	35	Very insufficient	3
2. In the past month, did you experience sleepiness while working non-standard tandard work shifts?						
None	1 Mild	33	Considerab	26	Intense	2
3. In the past month, while working non-standard shifts, did you have a problem falling asleep at bedtime?						
No problem	9 Minor prob	24	Considerab problem	27	Serious problem	2
4. In the past months, while working non-standard shift, did you have a problem staying asleep?						
No problem	10 Minor prob	27	Considerab problem	22	Serious problem	3
5. In the past month, while working non-standard shifts, did you have a problem with waking up to early and not being able to get back to sleep						
No problem	7 Minor prob	26	Considerab problem	24	Serious problem	5
6. In the past month, while working non-standard shifts, your overall quality of sleep (no matter how long you slept) was						
Satisfactory	10 Slightly Unsatisfactory	28	Somewhat Unsatisfactory	19	Very Unsatisfactory	5
7. In the past month, while working non-standard shifts, your sense of well-being during the time you were awake was						
Normal	14 Slightly decreased	27	Somewhat decreased	22	Very Decreased	3
8. In the past month, while working non-standard shift, your physical and mental functioning during the time you were awake was						
Normal	16 Slightly decreased	29	Somewhat decreased	17	Very Decreased	0
9. In the past month, how likely were you to doze off at work during your non-standard shift?						
Not at all	19 Slight chance	34	Moderate chance	10	Highly likely	3
10. In the past month, how likely were you to doze off while driving after working a non-standard shift?						
Not at all	9 Slight chance	37	Moderate chance	13	Highly likely	3

11. In the past month, how likely were you to doze off while commuting (not driving) after working a non-standard shift?						
Not at all	12 Slight chance	36	Moderate chance	9	Highly likely	5
SECTION C						
12. In the past year, did you have at least a one week break from working non-standard shifts (For example, one week of vacation, or one week of standard daytime shifts)						
Yes	53	No	9			
If YES, Go to Question 19. If NO, Go to Question 27						
13. During your break from non-standard shifts, your overall amount of sleep was						
Sufficient	21 Slightly insufficient	21	Somewhat insufficient	9	Very insufficient	2
14. During your break from non-standard shifts, did you experience sleepiness during the time you were awake?						
None	7 Mild	37	Considerab	8	Intense	1
15. During your break from non-standard shifts, did you have a problem falling asleep at bedtime?						
No problem	12 Minor problem	34	Considerab problem	5	Serious problem	2
16. During your break from non-standard shifts, did you have a problem with staying asleep?						
No problem	14 Minor problem	30	Considerab problem	9	Serious problem	0
17. During your break from non-standard shifts, your overall quality of sleep (no matter how long you slept) was						
Satisfactory	19 Slightly Unsatisfactory	28	Somewhat Unsatisfactory	6	Very Unsatisfactory	0
18. During your break from non-standard shifts, your physical and mental functioning during the time you were awake was						
Normal	23 Slightly decreased	25	Somewhat decreased	5	Very Decreased	0
19. During your break from non-standard shifts, how long was the time delay you experienced in getting to sleep at bedtime?						
No delay	13 Slightly delayed	24	Somewhat delayed	11	Very delayed	5
SECTION D						
20. How likely are you to doze off or fall asleep while driving after at least two days off from work?						
Not at all	26 Slight chance	27	Moderate chance	0	Highly likely	0

Staff Educational Program and Evaluation

The education program was implemented by introducing it via staff huddles for night shift a week prior to all surveys and emails being distributed. Eighty-six participants were identified (N=86) by managers as being night shift RN's. Site approval and IRB approval documentation for staff education for this doctoral project was

obtained (see Appendix H and Appendix I). This project was developed as an evidence-based educational intervention program aimed at advancing nurses awareness and management strategies to counteract night shift nurse sleepiness. The effectiveness was measured as RN's gained knowledge through pre- and post-intervention survey responses. All eighty-six RN's were invited by email to participate in this educational project focused on Sleepiness Awareness and Management Strategies (see Appendix J). A total of sixty-two participants (n=62) completed the surveys and the educational program included in the power-point.

In the Pre -Survey data participants were asked to answer questions regarding how well their sleep health was and their overall well -being. The ESS and KSS were also administered to understand sleep behavior and general level of daytime sleepiness. The ESS and KSS were used as Pre- Intervention and Post Education Intervention surveys to evaluate sleep health.

Post Intervention Education, the KSS (Table 8) showed improvement in scores. 15 RN's (24.19%) scored their sleepiness as *Very Alert* , an increase of 14.51%, 39 RN's (62.90 %) stated they were *Alert, Normal level*, an increase of 20.96%, Three RN's (4.838 %) responded to being *Neither Alert, nor Sleepy*, a decrease of 3.222%, Four RN's (6.45 %) responded to be *Sleepy, but no effort to keep awake*, a decrease of 30.64%, and One RN (1.61 %) responded that they were *Very Sleepy, great effort to keep awake, fighting sleep*, a decrease of 1.62%.

Post Intervention Education for the ESS (Table 9 and Table 10) showed 79.03% of the respondents were unlikely to be abnormally sleepy, an increase of 32.26%,

12.90% reported being excessively sleepy depending on the situation, a decrease of 25.80%, while 8.06% reported being excessively sleepy, a decrease of 6.51%.

In analyzing the effectiveness of the evidence-based educational program, post intervention education responses supported that the program as well as strategies to mitigate nurses' night shift sleepiness were gained. These results indicated that nurses had an increase in a self-perceived sleep management efficacy gain in knowledge after the education program.

Table 8 KSS Preintervention and Post Intervention Education

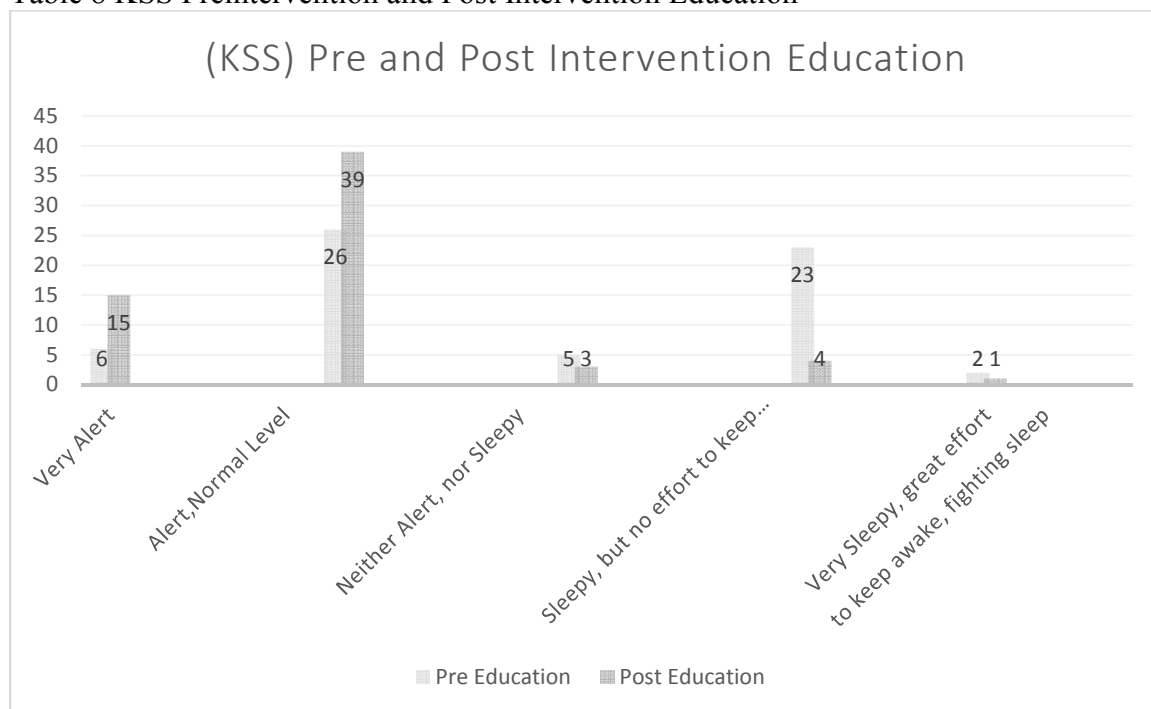


Table 9 ESS Pre intervention and Post Intervention Education

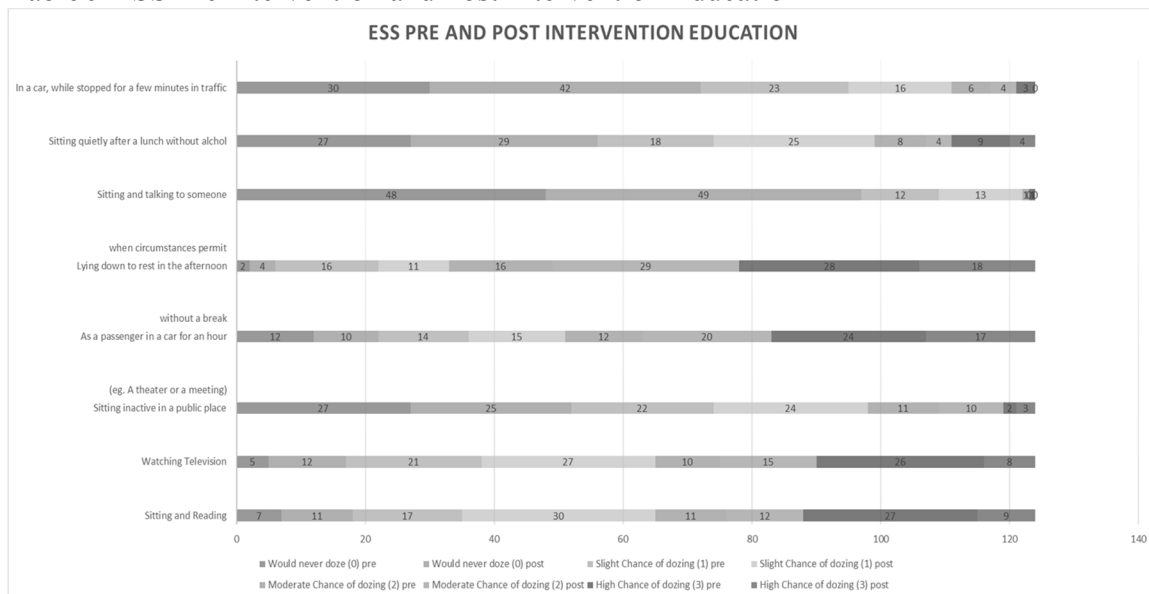


Table 10 Interpreting Epworth Sleepiness Scale Scores

Interpreting Epworth Sleepiness Scale Scores			
	Normal 0-10	EDS* >10	High Level of EDS* >16
Pre-Education	29	24	9
Post -Education	49	8	5
*Excessive Daytime Sleepiness			

Implications

The findings from the literature research links negative impacts of impaired sleep for night shift nurses was translated into practice to improve overall sleep health. The results demonstrated nurses' propensity for impaired sleep health working the night shift that is consistent with the literature. The findings established the existence of problematic sleepiness and validated the need for interventions such as this educational project. The results also showed that RN's showed an increased susceptibility to falling asleep at high rates and intensities. These results supported the need for this evidence based educational intervention program on sleep awareness and management strategies to improve sleep health. Based on the positive results of the educational program that yielded an increase in better sleep patterns post intervention, the educational program should be considered for all new hires working night shift. The educational program can contribute to positive social change through increasing night nurse knowledge of sleepiness and strategies to address the problem. The potential to lessen the night nurses' sleepiness can improve productivity and responsiveness to patient care creating a positive social change.

Recommendations

These findings were significant and were relevant in providing immediate countermeasures with the use of this evidence-based educational program developed for this project. The sample size was limited to just one area of the hospital and only included RN's; thus, results cannot be generalized to other units without further study

that included ancillary staff as well. Recognition of sleepiness in night shift nurses can benefit health care organizations in recognizing the problem and promoting staff education to develop sleep countermeasures to be implemented by night shift nurses. The healthcare organization and nursing staff can work together to support a healthier work environment.

Strength and Limitations of the Project

Health care organizations and Nursing leadership strive to provide workplace safety while promoting patient quality of care and improved outcomes. The surveys were administered on the premise that all staff would answer the questionnaires accurately and honestly to represent the true propensity of night shift nurse sleepiness.

Some of the benefits of this educational project will be promoting increased productivity along with increased engagement and quality of care of the nursing staff. By improving the sleep health of nurses, it is expected that there will be an adoption of better sleep strategies that will create a safer work environment that renders a higher quality of care.

Some limitations to this study was that there was no contact with the candidates due to COVID-19 restrictions in place. In following the recommendations of Walden University, no physical contact was made with participants, making it hard to interact during educational teaching. Due to lack of interaction and not being able to have educational sessions in person, this could have contributed to a decrease in the amount of participation by staff.

Summary

This DNP project focused on night shift nurses' sleepiness problem at this project site, a public hospital in Houston, Tx. The results of the surveys were in line with the professional literature that was reviewed. The educational program was developed to raise the nurses' awareness of sleep problems and the available management strategies to counteract night shift nurse sleepiness. The survey results showed that this educational program was relevant and appropriate in providing information to help improve the sleep health of nurses. The pre/post educational survey results showed that staff that participated in the project gained knowledge about improving sleep health through strategies learned and outcomes were improved. The sample size was small as it only include the medical-surgical units, but it provided adequate data to complete this DNP project and show the need for educational opportunities for all new hired night shift staff along with other units not included in these initial surveys.

Section 5: Dissemination Plan

The problem of night shift nurse sleepiness can be problematic to health care organizations. The problem of night shift sleepiness is often met with punitive actions from organizational leadership and staff. Nurses are subjected to disciplinary action if they are found asleep or dozing while on shift. Staff are often unaware of the prevalence of this problem and EBP-modulating strategies to mitigate night shift nurse sleepiness is important in helping them understand exactly what is defined as sleepiness. Assessing the problem and providing an evidence-based education program along with management strategies to mitigate sleepiness, it is expected to increase the understanding of night time sleepiness, promote EBPs that lead to a healthier work environment, and alleviate negative outcomes. Findings from this project provided a greater awareness of the night

shift nurse sleepiness problem and effective management strategies. The project revealed relevant information about night shift nurse sleepiness, provided strategies to improve nighttime sleepiness, and shifted the perception away from blaming the nurses for falling asleep to shared collaborative approaches to addressing the problem.

Findings will be disseminated through PowerPoint among nurses in the medical surgical units; nurse managers; clinical nursing directors; nurse educators; the assistant and chief nursing officers; and stakeholders who influence policies, including the chief quality officer and research council. Presenting the results of this to project stakeholders would help promote further support in mitigating nurse sleepiness. This information will help to facilitate communication, educate staff and leadership, and will help to implement changes that are crucial to policies influencing health care work environments and health-related outcomes.

The final project results will be presented at nursing seminars and conferences and will be published in health care and nursing journals. The results will show the implication nurse sleepiness has in the working environment and in-patient outcomes. Nurses account for the largest part of the health care industry and even though this project was aimed at them, there are many other health care professionals that can benefit from this project. Dissemination can be extended to medical professionals and other health care team members engaged in shift work. Consideration will also be given to present this information to advocate for legislative change related to shorter shifts or countermeasure programs in the health care work environment.

Analysis of Self

As a Scholar

In meeting the expectations of a DNP graduate, learning to research clinical practice and promote outcome metrics and patient outcomes has been successfully met. Navigating this journey to become a scholar has been enlightening, allowing for a higher learning threshold with great revelations revealed to how important this role is. In achieving the completion of this project, great satisfaction was achieved in the ability to follow the rigorous measures put in place by my learning institution. It has challenged me at times, but I managed to persevere and bring out the best in me as a scholar. I was often challenged with the obstacles I faced, but through my determination I was able to face the challenges and continue towards my goal of completing this doctoral level project. This project looked at how sleepiness in night shift nurses has been addressed and a new awareness to the problem was raised by introducing evidence-based educational instruction to advance the nurses' self-efficacy regarding sleepiness and strategies to manage the sleepiness.

In the role of a scholar, I was prepared to conduct research that would help gather evidence to help me carry out my investigation. There were many steps involved to create an educational program. The DNP program has prepared me with the foundation necessary to investigate and champion a scholarly improvement, and the knowledge to improve practice and impact nursing practice consistent with a doctoral level of knowledge.

As a Project Manager

Managing this DNP project helped to necessitate advance practice nursing and translate research and evidence-based inquiry into practice to improve quality care and outcomes, while eradicating the problem of nurse sleepiness. The purpose for this project and the experience it provided were drawn from DNP essentials with emphasis on leadership, quality improvement, and safety while improving nurses' sleepiness and increasing their awareness.

As a Professional

My purpose is to put research into practice and involve key stakeholders during planning and implementation. When developing research adoption and dissemination a major goal is to change the culture to one of safety while improving outcomes. Nursing as a profession should not simply cover providing support and healing for their patients, but in true altruism should also encompass the well-being of the nurse commitment to wellness ensuring the goals of the patients, their families, and the communities in which they live and work to one who optimizes all aspects of life. Completing this DNP project was key in advancing my professionalism.

Summary

The development of this DNP intervention project has taken a lot of time and perseverance before it resulted in this evidence-based education program. This project holds the potential for future research of night shift nurse sleepiness encountered in health care organizations. Translation of research into practice to solve problems and

increase nursing knowledge provides nurses the tool set necessary for managing the problem of night shift sleepiness.

I analyzed and interpreted the results of this project through descriptive statistics to answer the research questions posed for this DNP project. I discussed the indications, recommendations, and limitations of the project. Making nurses more aware of sleep management strategies can benefit the hospital leadership through collaborative approaches to promoting awareness of the problem and the use of strategies to counteract the sleepiness. This project has the potential to influence and contribute to nursing practice and create a positive social change. As the project manager of this DNP project, I have helped to lay the foundation for further research opportunities in the field of nurse sleepiness and sleep hygiene. Dissemination of the results holds the potential for nursing-practice changes in the future that will foster positive social change for patient care and improve health care settings.

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Appendix A: Email to Participants

Dear Potential Participants,

Let me introduce myself, my name is Margaret Garcia, and I am currently a DNP student at Walden University. I have been given the opportunity to reach out to all the night shift nurses who work in the Med-Surg units to help me conduct surveys related to my DNP educational project. My project is focusing on improving the sleep health of nurses and will introduce interventions that could help make positive changes in how nurses sleep after working a 12-hour shift at night. These surveys are anonymous and will not require you to give any personal information. All survey packets linked with this project are in your charge nurse office in manila envelopes. These envelopes should be sealed and returned to the charge after receiving this email and viewing PowerPoint that is attached. You will also receive a follow up email asking for you to rate your sleep health two weeks after utilizing the information in the PowerPoint that is attached to this email. Your participation in this project is greatly appreciated and will assist me in completing the requirements of my DNP program. If you have any questions, please feel free to reach out to your managers who have been given this information as well and can reach out to me for clarification on any questions you may have. Thank you again for your kind consideration in participating in this educational project.

Sincerely,

Margaret Garcia MSN, RNC-MN

Appendix B: Prediction Survey/Demographic Data

SHIFT WORK QUESTIONNAIRE

9 February 2010

Subject Code _____

Please read each question carefully before answering. Where necessary, answer the question to the best of your recollection. Although it is hoped that you will answer all of the questions, you may skip over any questions which you choose not to answer.

SECTION A

1. In the past month, did you typically work a non-standard shift schedule (starts before 7am or after 2pm, rotates, or regularly includes hours outside of the standard 7am to 6pm work day)?

YES NO

IF YES, GO TO QUESTION 2. IF NO, Discontinue participation.

2. On average, how many times per week do you work the non-standard shift?

3. When did you start working non-standard shifts? (fill in the bubble)

- Less than 1 month ago
 1-6 months ago
 7-12 months ago
 1-5 years ago
 More than 5 years ago

4. a. For non-rotating shifts, what time do you typically start a non-standard shift?

: AM PM (circle one)

b. For non-rotating shifts, what time do you typically end a non-standard shift?

: AM PM (circle one)

5. What is your age? years

6. What is your gender? M F

SECTION B

7. In the past month, while working non-standard shifts, your overall amount of sleep was

- Sufficient Slightly insufficient Somewhat insufficient Very insufficient

8. In the past month, did you experience sleepiness while working non-standard work shifts?

- None Mild Considerable Intense

9. In the past month, while working non-standard shifts, did you have a problem falling asleep at bedtime?

- No problem Minor problem Considerable problem Serious problem

SHIFT WORK QUESTIONNAIRE

9 February 2010

10. In the past month, while working non-standard shifts, did you have a *problem staying asleep*?
- No problem Minor problem Considerable problem Serious problem
11. In the past month, while working non-standard shifts, did you have a *problem with waking up too early and not being able to get back to sleep*?
- No problem Minor problem Considerable problem Serious problem
12. In the past month, while working non-standard shifts, your *overall quality of sleep* (no matter how long you slept) was
- Satisfactory Slightly unsatisfactory Somewhat unsatisfactory Very unsatisfactory
13. In the past month, while working non-standard shifts, your *sense of well-being during the time you were awake* was
- Normal Slightly decreased Somewhat decreased Very decreased
14. In the past month, while working non-standard shifts, your *physical and mental functioning during the time you were awake* was
- Normal Slightly decreased Somewhat decreased Very decreased
15. In the past month, how likely were you to *doze off at work during your non-standard shift*?
- Not at all Slight chance Moderate chance Highly likely
16. In the past month, how likely were you to *doze off while driving after working a non-standard shift*?
- Not at all Slight chance Moderate chance Highly likely Not applicable
17. In the past month, how likely were you to *doze off while commuting (not driving) after working a non-standard shift*?
- Not at all Slight chance Moderate chance Highly likely Not applicable

SECTION C

18. *In the past year, did you have at least a one week break from working non-standard shifts (for example, one week of vacation, or one week of standard daytime shifts)?*

YES NO

If YES, GO TO QUESTION 19. If NO, GO TO 27.

SHIFT WORK QUESTIONNAIRE

9 February 2010

19. During your break from non-standard shifts, your *overall amount of sleep* was
- | | | | |
|----------------------------------|---|---|---|
| <input type="radio"/> Sufficient | <input type="radio"/> Slightly insufficient | <input type="radio"/> Somewhat insufficient | <input type="radio"/> Very insufficient |
|----------------------------------|---|---|---|
20. During your break from non-standard shifts, did you *experience sleepiness during the time you were awake*?
- | | | | |
|----------------------------|----------------------------|------------------------------------|-------------------------------|
| <input type="radio"/> None | <input type="radio"/> Mild | <input type="radio"/> Considerable | <input type="radio"/> Intense |
|----------------------------|----------------------------|------------------------------------|-------------------------------|
21. During your break from non-standard shifts, did you have *a problem falling asleep at bedtime*?
- | | | | |
|----------------------------------|-------------------------------------|--|---------------------------------------|
| <input type="radio"/> No problem | <input type="radio"/> Minor problem | <input type="radio"/> Considerable problem | <input type="radio"/> Serious problem |
|----------------------------------|-------------------------------------|--|---------------------------------------|
22. During your break from non-standard shifts, did you have *a problem with staying asleep*?
- | | | | |
|----------------------------------|-------------------------------------|--|---------------------------------------|
| <input type="radio"/> No problem | <input type="radio"/> Minor problem | <input type="radio"/> Considerable problem | <input type="radio"/> Serious problem |
|----------------------------------|-------------------------------------|--|---------------------------------------|
23. During your break from non-standard shifts, your *overall quality of sleep* (no matter how long you slept) was
- | | | | |
|------------------------------------|---|---|---|
| <input type="radio"/> Satisfactory | <input type="radio"/> Slightly unsatisfactory | <input type="radio"/> Somewhat unsatisfactory | <input type="radio"/> Very unsatisfactory |
|------------------------------------|---|---|---|
24. During your break from non-standard shifts, your *physical and mental functioning during the time you were awake* was
- | | | | |
|------------------------------|--|--|--------------------------------------|
| <input type="radio"/> Normal | <input type="radio"/> Slightly decreased | <input type="radio"/> Somewhat decreased | <input type="radio"/> Very decreased |
|------------------------------|--|--|--------------------------------------|
25. During your break from non-standard shifts, how long was the *time delay you experienced in getting to sleep at bedtime*?
- | | | | |
|--------------------------------|--|--|------------------------------------|
| <input type="radio"/> No delay | <input type="radio"/> Slightly delayed | <input type="radio"/> Somewhat delayed | <input type="radio"/> Very delayed |
|--------------------------------|--|--|------------------------------------|

SECTION D

26. How likely are you to *doze off or fall asleep while driving after at least two days off from work*?
- | | | | | |
|----------------------------------|-------------------------------------|---------------------------------------|-------------------------------------|--------------------------------------|
| <input type="radio"/> Not at all | <input type="radio"/> Slight chance | <input type="radio"/> Moderate chance | <input type="radio"/> Highly likely | <input type="radio"/> Not applicable |
|----------------------------------|-------------------------------------|---------------------------------------|-------------------------------------|--------------------------------------|

27. THANK YOU FOR PARTICIPATING. YOUR COOPERATION IS MUCH APPRECIATED.

Appendix C: Epworth Sleepiness Scale



EPWORTH SLEEPINESS SCALE

Name: _____ DOB: _____ Date: _____

This questionnaire was developed to determine the level of daytime sleepiness in individuals. It has become one of the most frequently used methods for determining a person's average level of daytime sleepiness.

Please rate how likely you are to doze or fall asleep in the following situations by selecting the response that best applies. If you have not done some of these activities recently, select what would most likely happen if you were in that situation.

0 Would never doze **1** Slight chance of dozing **2** Moderate chance of dozing **3** High chance of dozing

	Chance of Dozing			
Sitting and reading	0	1	2	3
Watching television	0	1	2	3
Sitting inactive in a public place (eg, a theater or a meeting)	0	1	2	3
As a passenger in a car for an hour without a break	0	1	2	3
Lying down to rest in the afternoon when circumstances permit	0	1	2	3
Sitting and talking to someone	0	1	2	3
Sitting quietly after a lunch without alcohol	0	1	2	3
In a car, while stopped for a few minutes in traffic	0	1	2	3
Total Score:				

Interpreting Epworth Sleepiness Scale Scores ^{1,2}		
Normal	EDS*	High Levels of EDS*
0-10	>10	>16

Sources: 1. Johns M, Hocking B. Excessive daytime sleepiness: daytime sleepiness and sleep habits of Australian workers. *Sleep*. 1997;20(10):844-849. 2. Johns MW. A new method for measuring daytime sleepiness: the Epworth sleepiness scale. *Sleep*. 1991;14(6):540-545. This copyrighted material is used with permission granted by the Associated Professional Sleep Societies—April 2018. Unauthorized copying, printing, or distribution of this material is strictly prohibited.

*Excessive daytime sleepiness.

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ES & OSA

Appendix D: Karolinska Sleepiness Scale (KSS)

Karolinska Sleepiness Scale (KSS)

Karolinska Sleepiness Scale (KSS)

Place the X next to the ONE statement that best describes your SLEEPINESS during the PREVIOUS 5 MINUTES. You may also use the intermediate steps.

- 1. very alert
- 2.
- 3. alert, normal level
- 4.
- 5. neither alert nor sleepy
- 6.
- 7. sleepy, but no effort to keep awake
- 8.
- 9. very sleepy, great effort to keep awake, fighting sleep

Use {UP/ DOWN} cursor keys to move block, then press {ENTER}

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Appendix H: Site Approval



Shannan K. Hamlin, PhD, RN, ACNP-BC, AGACNP-BC, CCRN
7550 Greenbrier, RB3, Mailbox 1
Houston, TX 77030-2707
(346) 356-1327
SHamlin@HoustonMethodist.org

July 29, 2020

To: Margaret Garcia, MSN, RNC

SUBJECT: HMAI Determination of Not Human Subject Research: Guiding Nurses to a Healthier Lifestyle

Based on the information and protocol provided, the HMRI IRB has determined that the project referenced above does not meet the definition of Human Subject Research per 45 CFR 46 and does not require prior IRB review and approval at Houston Methodist.

Please understand that should your protocol change in any way your new protocol will need to be resubmitted for review and a new IRB determination made before any data collection can begin.

If you have any questions, do not hesitate to contact me. Best of luck on a successful evidence-based practice project!

Sincerely,

Shannan Hamlin, PhD, RN, ACNP-BC, AGACNP-BC, CCRN, NE-BC
HMAI IRB Designated Member

Appendix I: IRB Approval

IRB Materials Approved - Margaret Garcia

IRB <irb@mail.waldenu.edu>

Fri 9/4/2020 4:55 PM

To: Margaret Garcia <margaret.garcia2@waldenu.edu>

Cc: Cheryl Holly <cheryl.holly@mail.waldenu.edu>

1 attachments (229 KB)

Garcia Consent Form.pdf;

Dear Ms. Garcia,

This email is to confirm that, based on your responses to Form A, your DNP study appears to fall within the parameters that the IRB pre-approved for a DNP Staff Education project. This means that you are permitted to collect and analyze data from anonymous staff questionnaires, public data/literature, and internal site documents/data, as per the terms of the pre-approved site agreement (Appendix A) and Consent Form (Appendix B) in the DNP Staff Education Manual. No other data may be collected by you without prior approval from the IRB.

Your approval # is 09-04-20-0759793. You will need to reference this number in your final doctoral study and in any future funding or publication submissions. You are required to use the consent form provided in the DNP Staff Education Manual. A copy of this consent form tailored to include your IRB approval number is attached, and no edits may be made to this approved text.

Your IRB approval expires on September 3, 2021 (or when your student status ends, whichever occurs first). One month before this expiration date, you will be sent a Continuing Review Form, which must be submitted if you wish to collect data beyond the approval expiration date.

Your IRB approval is contingent upon your adherence to the exact procedures described in the DNP Staff Education Manual and the final version of the IRB form that has been submitted as of this date. This includes maintaining your status with the university. Your IRB approval is only valid while you are an actively enrolled student at Walden University. If you need to take a leave of absence or are otherwise unable to remain actively enrolled, your IRB approval is suspended. Absolutely NO participant recruitment or data collection may occur while a student is not actively enrolled.

If you need to make any changes to your project procedures, you must obtain IRB approval by submitting the IRB Request for Change in Procedures Form. You will receive confirmation with a status update of the request within 10 business days of submitting the change request form and are not permitted to implement changes prior to receiving approval. Please note that Walden University does not accept responsibility or liability for doctoral scholarship activities conducted without the IRB's approval, and the University will not accept or grant credit for student work that fails to comply with the policies and procedures related to ethical standards in research and scholarship.

When you submitted your IRB application, you made a commitment to communicate both discrete adverse events and general problems to the IRB within 1 week of their occurrence/realization. Failure to do so may result in invalidation of data, loss of academic credit, and/or loss of legal protections otherwise available to the doctoral student.

Both the Adverse Event Reporting form and Request for Change in Procedures form can be obtained at the Documents & FAQs section of the Walden web site: <http://academicguides.waldenu.edu/researchcenter/orec>

Doctoral researchers are required to fulfill all of the Student Handbook's [Doctoral Student Responsibilities Regarding Research Data](#) regarding raw data retention and dataset confidentiality, as well as logging of all recruitment, data collection, and data management steps. If, in the future, you require copies of the originally submitted IRB materials, you may request them from Institutional Review Board.

Both students and faculty are invited to provide feedback on this IRB experience at the link below:

http://www.surveymonkey.com/s.aspx?sm=qHBJzkJMUx43pZegKlmdiQ_3d_3d

Sincerely,
Libby Munson
Research Ethics Support Specialist
Office of Research Ethics and Compliance
Walden University
100 Washington Avenue South, Suite 900
Minneapolis, MN 55401
Email: irb@mail.waldenu.edu
Phone: (612) 312-1283
Fax: (626) 605-0472

Information about the Walden University Institutional Review Board, including instructions for application, may be found at this link: <http://academicguides.waldenu.edu/researchcenter/orec>

Appendix J: Consent for Surveys

Consent Form for Anonymous Questionnaires

To be given to the staff member prior to collecting questionnaire responses—note that obtaining a “consent signature” is not appropriate for this type of questionnaire and providing respondents with anonymity is required.

You are invited to take part in an evaluation for the staff education doctoral project that I am conducting.

Questionnaire Procedures:

If you agree to take part, I will be asking you to provide your responses anonymously, to help reduce bias and any sort of pressure to respond a certain way. Staff members' questionnaire responses will be analyzed as part of my doctoral project, along with any archival data, reports, and documents that the organization's leadership deems fit to share.

Voluntary Nature of the Project:

This project is voluntary. If you decide to join the project now, you can still change your mind later.

Risks and Benefits of Being in the Project:

Being in this project would not pose any risks beyond those of typical daily professional activities. This project's aim is to provide data and insights to support the organization's success.

Privacy:

I might know that you completed a questionnaire but I will not know who provided which responses. Any reports, presentations, or publications related to this study will share general patterns from the data, without sharing the identities of individual respondents or partner organization(s). The questionnaire data will be kept for a period of at least 5 years, as required by my university.

Contacts and Questions:

If you want to talk privately about your rights in relation to this project, you can call my university's Advocate via the phone number 612-312-1210. Walden University's ethics approval number for this study is 09-04-20-0759793.

Before you start the questionnaire, please share any questions or concerns you might have.



2020.09.04

16:53:45

-05'00'

Appendix K: PowerPoint Presentation

Guiding Night Shift to a Healthier Lifestyle

- By: Margaret Garcia ,MSN, DNP Program
- Walden University



Educational Objectives

1. Define Night Shift Nurses' Fatigue and Sleepiness
2. Identify factors contributing to Nurse Fatigue and Sleepiness
3. Define consequences of Nurse Fatigue and Sleepiness.
4. Define changes that can be made to prevent Nurse Fatigue and Sleepiness.



Nurses provide continuous patient care around the clock. Nurses who work other than 9 to 5 are susceptible to fatigue and sleep deprivation that impairs attention to detail, ability to remain focused, information processing, and problem solving. This is especially prevalent among those who work the night shift. The educational objectives will explore the physical and psychological symptoms night shift nurses experience and will provide nurses with strategies to improve symptoms.



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Learners Objectives

1. Understand the problem of night shift nurses' sleepiness
2. Aware of the contributing factors
3. Knowledgeable about consequences
4. Manage night shift fatigue and sleepiness through learned strategies

Participants of this project will be more aware of risks of sleep deprivation and how changing their lifestyle would benefit them.



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Purpose of Educational Manual

- The purpose of this education program is to increase nurse awareness of fatigue and sleepiness and provide strategies that will mitigate nurse fatigue and sleepiness.

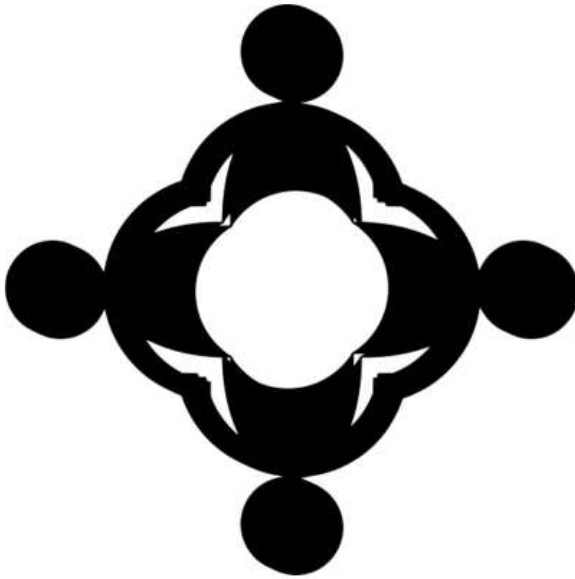
Promoting a sleep health education program not only will improve nurses' sleepiness, but will improve nursing practice, nurse satisfaction, and decrease negative patient outcomes due to mistakes. Organizations can expect positive outcomes due to nurses increasing their quality of life leading to an increase in organizational productivity and efficiency.



Understanding how poor sleep builds up to sleepiness is necessary in Fatigue and Sleepiness. Nurses often believe that if enough sleep is not obtained on one day, they can make up for it the following day. Poor sleep patterns have a way of getting worse daily if not changed or if learned behaviors are not started early.



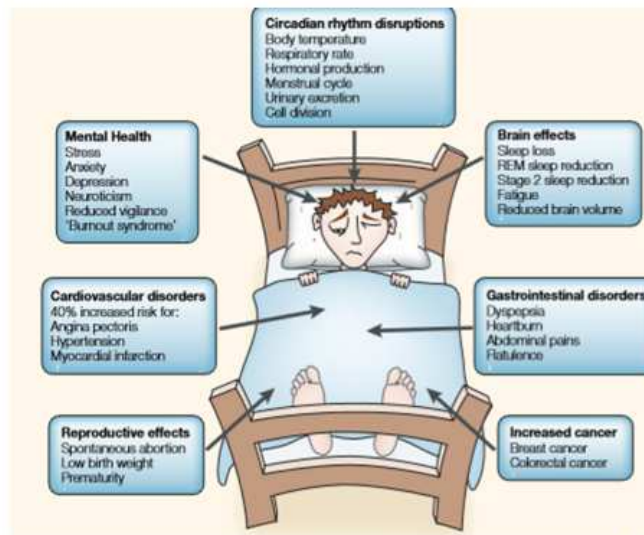
Work related fatigue in nurses has been defined as “ multidimensional state that arises in workers who are exposed to excessive demands through their work tasks, environment and schedules, and that can interfere with workers’ physical and cognitive abilities and their ability to function at their normal capacity” (Drake & Steege,2016,pE2).



What is Sleep Health

- Sleep Health is the achievement of adequate sleep.
- Adequate sleep is closely related to quality of sleep.
- Adequate sleep is necessary to prevent illness, increase work performance, and to work safely and effectively.
- Poor sleep health can also cause endocrine, metabolic and neurological imbalances leading to multiple health issues.

Improving performance measures like sleep health promotes positive work environment, improved quality of care, engagement, retention, and reduction in harmful events within an organization.



(Foster & Wulff, 2005) Reproduced with permission

Shift Work Disorder

- Characterized by sleepiness and insomnia
- Occurs when an individual attempts to stay awake when internal biological clock is telling them to sleep.
- Is often diagnosed when complaints of insomnia, poor sleep quality, and daytime sleepiness is present.

Shift worker is often interchangeable with night shift worker and is considered anyone who follows a work schedule that is outside of the typical “9 to 5” business day.

Consequences of Nurse Sleepiness

Patients

- Medication errors
- Delayed response time
- Decrease in quality of care
- Decrease in safety
- Patient intervention time delayed
- Missed lab results
- Misinterpretation of test results and signs of decompensation (Wingler & Keys,2019)

Nurses

- Cognitive problems
- Mood Swings
- Poor job performance
- Increased safety risks
- Physiological Changes
- Clinical decision regret
- Increased risk for vehicular accidents (ANA,2014)

Nurses often suffer from sleep deprivation; this is defined as having insufficient sleep that can lead to inadequate alertness and a decrease in performance and overall health. According to the National Institutes of Health, most adults need eight hours of sleep. Inadequate sleep and resulting fatigue can affect a nurses' ability to deliver optimal patient care and can also predispose them to illness and unsafe behavior that can directly affect them as well.



Consequences of Nurse Sleepiness To the hospital

- Decrease in job satisfaction
- Increase in turnover rate
- Higher liability due to nurse errors
- Decreased productivity

The Bureau of Labor Statistics, (2019), has 29 million registered nurses in the United States and 38.4% working night shift. Direct costs to employers include increases in health care costs, workers compensation claims, early disability costs, recruitment and training costs and legal fees (ANA,2014).Circadian, a shift work consulting company , estimates fatigue- related accidents, lost productivity, and health care expenses costs U.S. employers \$116.5 billion per year(Sirois,2007). Failure to retain nurses increases costs for healthcare organizations (Hart,2001).

Interventions for Combatting Sleepiness and Fatigue

Countermeasures

- Getting adequate sleep prior to shift
- Exercise
- Herbal and Alternative Therapies
- Lighting

Examples

- Seven to nine hours of sleep
- Short periods of exercise can increase alertness if done three hours before bed (Caruso & Hitchcock,2010).
- Melatonin is a major hormone responsible for circadian rhythm regulation and chamomile tea can all help contribute to sleep.
- Light suppresses melatonin production and initiates wakefulness and alertness. Lights on unit should be on till morning and then dimmed. Sunglasses should be worn on way home

The NSF recommends seven to nine hours of sleep a day (NSF,2011). Exercise in short periods can increase alertness but should be done three hours prior to going to bed, the reason is that body temperature increases with exercise making it harder to go to sleep. Melatonin and Chamomile are often used to help with sleep, but females should use caution when using melatonin as it can have adverse effects on menstrual cycles (Buscemi, Vandermeer, & Hooten,2006).Lighting is very important and bright light should be used on units to maintain alertness. Lights should be dimmed in the morning a few hours before change of shift and nurses should be encouraged to wear sunglasses on their way home to avoid bright light that could inhibit melatonin productions. Blackout curtains are strongly suggested in bedrooms along with no electronic devices as the light can disturb sleep (Kayumov et al., 2005).

Interventions for Combatting Sleepiness and Fatigue continued

Countermeasures

- Lighting
- Temperature
- Naps
- Nutrition

Examples

- Black out shades on windows at home
- No electronics in room when falling asleep
- To facilitate sleep, temperature of your room should be cool to keep body temperature cooler for sleep.
- May help to increase alertness and vigor
- Nappers reported feeling energized and refreshed
- Three balanced meals should be eaten

Body temperatures should be kept cool to help go to sleep and stay asleep (Touitou, Reinberg, & Touitou,2017). Napping prior to work is often helpful or even when on break, but should be limited to 20-30 minutes (NSF,2011).

Nutrition should be monitored so that leptin levels will be maintained through three balanced meals. If the body goes into ketosis because sugar levels drop, it can cause a drop in blood pressure causing fatigue (NSF,2011).

Interventions for Combatting Sleepiness and Fatigue continued

Countermeasures

- Nutrition
- Social Drugs
- Stress Management

Examples

- Eat carbohydrates in the morning to help promote sleep
- Eat protein in the evening especially on nights worked to provide extra energy and stimulate alertness.
- Eat easily digested meals, Suggested small and frequent meals be eaten.
- Legal stimulants often used such as caffeine and nicotine
- Accupuncture
- Meditation

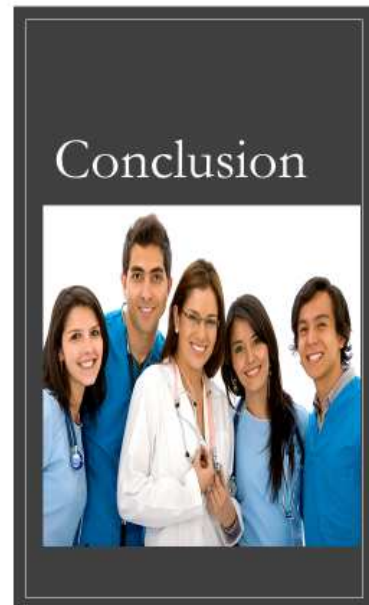
It is not uncommon that nurses will use caffeine and nicotine to stay alert, but awareness on health concerns related to the use of these stimulants should be discussed. Stress Management is necessary for all nurses and acupuncture, meditation and yoga are often used to help.




Work Hours

- Overtime should be minimal
- 12 hours shifts should be limited to no more than four consecutive days

The recommendation by the Institute of Medicine (IOM), is that voluntary overtime be limited and that they do not work more than four consecutive days in a row.



Please pickup your survey packet from your charge nurse office  Thank you for your participation



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