

4-9-2021

The Impact of the Night Shift on the Well-being of Nurses and Ways to Mitigate Them

Gareth T. Elkins

Follow this and additional works at: <https://huskiecommons.lib.niu.edu/studentengagement-honorscapstones>

Recommended Citation

Elkins, Gareth T., "The Impact of the Night Shift on the Well-being of Nurses and Ways to Mitigate Them" (2021). *Honors Capstones*. 1208.
<https://huskiecommons.lib.niu.edu/studentengagement-honorscapstones/1208>

This Article is brought to you for free and open access by the Undergraduate Research & Artistry at Huskie Commons. It has been accepted for inclusion in Honors Capstones by an authorized administrator of Huskie Commons. For more information, please contact jschumacher@niu.edu.

NORTHERN ILLINOIS UNIVERSITY

The Impact of the Night Shift on the Well-being of Nurses and Ways to Mitigate Them

A Capstone Submitted to the

University Honors Program

In Partial Fulfillment of the

Requirements of the Baccalaureate Degree

With Honors

Department Of

Nursing

By

Gareth Elkins

DeKalb, Illinois

05/08/2021

Funding sources

This research survey did not receive any funding from any agencies in the public, commercial, or non-profit sectors.

Ethical approval details

The study was approved by the Northern Illinois University, Institutional Review Board (#HS21-0188).

Conflicts of Interest

There are no conflicts of interest in this work

University Honors Program

Capstone Faculty Approval Page

Capstone Title: **The Impact of the Night Shift on the Well-being of Nurses and Ways to Mitigate Them**

Student Name (print or type): **Gareth Elkins**

Faculty Supervisor (print or type): **Cristan Sabio**

Faculty Approval Signature:



Department of (print or type): **Nursing**

Date of Approval (print or type): 10/2/2020

Date and Venue of Presentation: **School of Nursing Honors Poster Day on April 12th**

Check if any of the following apply, and please tell us where and how it was published:

Capstone has been published (Journal/Outlet):

Capstone has been submitted for publication (Journal/Outlet):

Completed Honors Capstone projects may be used for student reference purposes, both electronically and in the Honors Capstone Library (CLB 110).

If you would like to opt out and not have this student's completed capstone used for reference purposes, please initial here: _____ (Faculty Supervisor)

Abstract

Working the night shift as a registered nurse (RN) is not something that many individuals would consider an easy job. With the already existing stresses of the job being placed on the nurse, along with the added challenges of working against the body's natural circadian rhythm and routine, there can be many detrimental side effects to the nurses. The purpose of this paper is to evaluate how RNs who work the night shift are dealing with the effects working the night shift has on them such as increased fatigue, as well as potential weight gain or weight loss. This was a descriptive survey study to evaluate how the nurses who work the night shift are affected, and what they do in response to these effects. The survey was conducted using the online software service, Qualtrics XM, and thirty-two RNs responded. Results of the survey supported the literature of the night shift affecting nurses in a negative sense with large percentages of participating nurses reporting lack of sleep, negative changes in their diet during the days they work the night shift, lack of exercise, and unexplained weight loss or weight gain since starting the night shift. Many nurses find preparing meals and using premade meals at work helps them maintain a healthier diet, but only a small percentage actually use this method, and an even smaller percentage focus on making the meals with proper nutrients. Many reported using caffeine or high-sugar drinks throughout most of their shifts and felt their performance would drop if they did not have these beverages.

The Impact of the Night Shift on the Well-Being of Nurses and Ways to Mitigate Them

Burnout in registered nurses has been an increasing problem for many years now, with a study of 257 nurses across the United States in 2017 showing that 63% of them had experienced burnout, 44% feared their patients had suffered because of their burnout, and 41% considered leaving their job or the hospital they had been working at (Kronos, 2017). When it comes to working a night shift, nurses are required to deal with the same stressful aspects of the job as day shift nurses must, but also have the added requirement of going against what our bodies deem as natural, i.e., being awake during the day and sleeping during the night. The way our bodies normally function is driven by a biological clock that produces a circadian rhythm that increases our alertness during the daytime as well as decreases it during the night (Dijk & Czeisler, 1994). When we task our bodies with working at night, we are requiring our body to be asleep when our bodies drive to be awake is highest, while also demanding it be awake when our drive to be awake is lowest. This results in less amounts of sleep and excessive sleepiness when awake which can result in increased errors at work as well as degraded personal health (Folkard & Akerstedt, 2004). While research on what the night shift does to the body is well-documented, there has not been any research found about how nurses, specifically, manage the negative effects. This paper presents the results of an online survey of registered nurses (RNs) regarding the effects of the night shift on their well-being and the methods they use to mitigate unwanted effects.

Literature Review

Metabolic Changes

When our bodies are functioning under normal circumstances, the hormones ghrelin (stimulates appetite) and leptin (tells us when to stop eating) work together to moderate our

feeding patterns by establishing a routine that includes when we eat, how much we eat, and the quality of nutrients we are ingesting. However, when working the night shift, the mealtimes must be altered to account for the change in the sleep/wake schedule, which disrupts the coordination between leptin and ghrelin and dysregulates our biological systems related to diet, weight, and metabolism (Spaeth et al., 2013). An alteration in the sleep pattern, insufficient sleep as well as altered meal timing have also been shown to disturb the way our body metabolizes glucose (Spiegel et al., 1999), which leads to an increased risk of type II diabetes (Knutsson & Kempe, 2014). Working at night has also been estimated to increase the risk of developing metabolic syndrome by more than 50% (Wang et al., 2014). Although factors such as exercising and eating healthy foods are an important part of preventing metabolic syndrome and diabetes, the evidence of a connection between night shift work and worse metabolic health is strong.

Cardiovascular Implications

Along with metabolic changes that occur in night shift workers, there have been various studies that show the detriment it can cause on a person's cardiovascular system as well. In a study conducted by (Pimenta, et al., 2012), they found the prevalence of heart disease to be 67% higher in night shift workers. As healthcare workers there are many stressful aspects of the job, and chronic stress associated with night shift work has been linked to an increased risk for coronary heart disease (Szosland, 2010). Along with stress playing a factor in heart disease, there also has been research done that shows how night shift work can be a risk factor for an increased lipid profile, which can lead to further complications with the heart such as myocardial ischemia and myocardial infarction (Ghiasvand et al., 2006).

While these studies have laid out a great foundation of knowledge as to what exactly is happening to our bodies when we work nights shifts, there is no research being done on what

exactly nurses are doing to mitigate the physiological and psychological effects the night shift causes nurses. Along with the litany of health problems a night nurse is more at risk for, their patients also become more at risk for harm. Research has shown the negative effect working the night shift can have on not only the nurses, but the patients they care for as well. One study showed that there appears to be a significant and direct relationship between sleep deprivation and an increase in medical errors (Johnson et al., 2014).

Unhealthy Lifestyle Factors Influenced by the Night Shift

The negative side effects felt by employees who work the night shift are both noticeable, and often alarming. Eating more unhealthy foods (Costa, 1996), increased stress and frequency of sickness (Almeida & Malheiro, 2016), and decreased skeletal muscle health (Aisbett et al., 2017), these are all things that have been shown to occur more frequently in night shift workers. Due to these recognizable side effects, it is important we understand how night shift workers are reacting and adjusting their habits, if they are at all, in order to come up with healthier and more efficient ways of mitigating the negative side effects working the night shift can cause.

A study by Esquirol, et al. found that night shift workers ate meals more frequently than their day shift counterparts (Esquirol, et al., 2009). Eating more frequently, if not accompanied by exercise or reduction in average meal caloric intake to offset the increased frequency of meals, can lead to a caloric excess which will cause weight gain and other metabolic issues in individuals. Along with eating more frequently, it was also found that there was a higher rate of physical inactivity (less than one hour of non-work-related physical activity) among night shift workers as well (Pelkonska et al., 2014). Whereas the exact reason for why night shift workers in this study were not getting as much physical activity as recommended is unknown, it is alarming as physical activity is needed to not only help maintain weight, but help with other health aspects

such as cardiovascular health, gastrointestinal motility, bone health, etc. Finally, in a study that looked at the caffeine consumption of emergency room residents, it was found that 89% of the residents reported consuming caffeinated drinks during their night shifts, with 52% saying they consume caffeinated drinks during every shift (Shy et al., 2011). The purpose of this paper is to discuss the results of the survey distributed to nurses working the night shift and evaluate further how the night shift affects the overall well-being of nurses, as well as methods night shift nurses are currently using to mitigate the problems that could bring detriment to their own health, as well as the quality of care they provide to their patients.

Methods

This study used a descriptive survey design, using the online research software, Qualtrics XM. The data were collected in a large midwestern hospital. Due to limited access to participants, the inclusion criteria for the study were the following: any RN working either the night shift full time or works the night shift along with the day shift on a rotating schedule. Convenience sampling was thus adopted. All the RNs who took part in the survey chose to participate willingly after being sent the survey along with the recruitment email and informed consent from their unit educators in an email.

After approval from the Institutional Review Board (IRB) at the researcher's University, an application and presentation about the research survey was given to the Institutional Research Oversight Committee (IROC) and IRB at the survey's hospital location, where approval was received to distribute the survey to unit educators. The unit educators then forwarded the recruitment email, informed consent, and survey (Appendix I) to potential participants on their unit, via email. Data collection took place during the month of March 2021. Data collected included participants' demographic characteristics such as age, gender, marital status, whether

they have children, years of experience as a nurse, and years of experience as a night nurse to better understand this sample of nurses being surveyed. Subsequent questions were designed using multiple different methods such as close-ended questions, multiple choice questions a numeric scale, and a modified Likert scale. Mitigation questions were based on the findings from the studies discussed under the part of the literature review that brought the higher likelihood of night shift workers to not exercise as much as recommended, not eat as healthy of a diet, and consume more caffeinated energy drinks.

Results

The study participants (N = 32) were all RNs and included eight males and twenty-six females at a large Midwestern hospital in the United States. The number of years' experience working the night shift ranged from 0.5 to 23 years and thirty-one of the participants worked night shifts only and one participant worked rotating day and night shifts. The majority of participants were either married (14), cohabitating (4), or in a relationship (5). Twenty-one did not have children.

Effects on Sleep

Of the 32 RNs that filled out the survey, 78% reported that they received, on average, 5 hours of sleep or less during the day preceding their night shift, and of these twenty-five nurses, 28% reported receiving less than three hours. Twelve percent of nurses reported feeling as if they had enough sleep before their night shifts during the past month whereas 34% reported feeling as if they did not get enough sleep to be as productive as they would want to be for more than half their shifts for that month. Eighty-one percent reported an average energy level of 6/10 or lower as a result.

Effects on Nutrition

Sixty-two percent of participants reported having a somewhat or very difficult time eating the recommended daily amount of fruits and vegetables which is 5 servings a day (American Heart Association, 2017), and 34% reported that they got their daily recommended daily servings in just about every day or most of the time. Seventy-two percent of participants reported having to adjust how they eat for the days they were their night shifts, and another 72% reported having negative changes in their diet since beginning to work the night shift. Forty-one percent of participating RNs reported having gone through unexplained weight gain or weight loss at some point since they began working night shifts.

Effects on Exercise

Fifty-six percent of participating RNs reported finding it either somewhat or very difficult to get in the daily recommended amount of exercise which is 30 minutes a day (Mayo Clinic, 2019). Fifty percent of participating nurses reported getting in the recommended amount of exercise during the day they worked their shift whereas 19% reported only sometimes getting it in, and 31% reportedly rarely or never getting in the daily recommended amount of exercise.

Methods to Mitigate

Forty-seven percent of RNs who participated reported using physical aids such as an eye mask, closed blinds, and ear plugs to help them sleep. Along with these results, 28% reported using over the counter medications like melatonin, or prescribed medication such as Lunesta, to help them sleep, leaving 12.5% reporting they used natural and herbal remedies (teas and essential oils), and an additional 12.5% reporting they used nothing to aid them in sleeping.

Forty-seven percent of participants reported saying they believe their performance would drop where an additional 19% reported saying they are not confident in their ability to perform their nursing duties safely and efficiently without the use of caffeinated beverages due to their lack of energy and sleep. Whereas 31% of the participants reported an energy level of 3/10 or lower when not using caffeinated beverages during their night shift. Seventy-eight percent of participating nurses also reported using caffeine or high sugar drinks throughout most of their shifts during the past 30 days and 75% reported using these drinks to aid in their staying awake during every shift or for most of the shifts they worked during the past 30 days.

Eighty-one percent of RNs who participated reported using premade meals helped them maintain a healthier diet; however, only 47% of participants reported using premade meals for their shifts just about every shift, or for most of their shifts over the past 30 days. Finally, 31% of participants reported making premade meals that focused on proper nutrients and 34% of participants reported actively using exercise to maintain their weight.

Discussion

The findings of this research survey support the literature and found similar results to past research. Seventy-eight percent of participating nurses reported that they received 5 hours or less of sleep a night, which is troubling as the daily amount of sleep that is recommended for adults 18 years and older, is seven to nine hours (Mayo Clinic, 2019). Research has shown that when adults do not receive the daily recommended amount of sleep side effects can include emotional distress, mood disorders and other mental health problems such as cognition, memory, and performance deficits; and behavior problems in otherwise healthy individuals (Medic et al., 2017). Nursing is a career that requires the ability to handle high stress situation, critically think, and be kind and compassionate to the patients that are being taken care of, and a lack of sleep has

been shown to make those who are sleep deprived more irritable and less patient (Saghir et al., 2018).

Along with concerns regarding sleep deprivation in nursing staff on nights, 78% of participating nurses reported using caffeine or high sugar drinks throughout most of their shifts during the past 30 days and 75% reported using these drinks to aid in their staying awake during just about every shift or for most of the shifts they worked during the past 30 days. Chronic caffeine use has been shown to increase blood pressure (Noordzij, 2005), and in individuals who already have heart conditions, has been linked to serious cardiovascular events, including arrhythmias and sudden cardiac death (Enriquez & Frankel, 2017).

Further, 62.5% of participating RNs reported that when they work the nightshift, they find it either somewhat or very difficult to eat 5 servings of fruits and vegetables recommended by the American Heart Association. Along with this finding, 72% reported having negative changes in their diet since beginning to work the night shift. As for mitigation, premade meals and how night shift nurses use these, 81% of participating RNs found using premade meals helped them maintain a healthier diet; however, only 47% of participants reported using premade meals for their shifts just about every shift, or for most of their shifts which means that while most have seen the benefits of pre-preparing meals, less than half actually implement this as a method to mitigate the negative dietary side effects of working the night shift. These results support the previous literature that found that night shift workers had a more unbalanced diet with a greater preference for high-fat diet and sweets, and an abnormal eating patterns due to the abnormal time being awake and active (Peplonska et al., 2019). It is therefore not a surprise that 41% of participating RNs reported having gone through unexplained weight gain or weight loss at some point since they began working night shifts.

Additionally, 56% of participating RNs reported finding it either somewhat or very difficult to get in the daily recommended amount of exercise which is 30 minutes a day (Mayo Clinic, 2019). Fifty percent of participating nurses reported getting in the recommended amount of exercise during the day they worked their shift whereas 19% reported only sometimes getting it in, and 31% reportedly rarely or never getting in the daily recommended amount of exercise. There is irrefutable evidence that exercise helps prevent the development of several chronic diseases such as cardiovascular disease, diabetes, cancer, hypertension, obesity, depression and osteoporosis and premature death (Warburton et al., 2006), and because of this, it is important for people of all ages and professions to be getting in adequate enough exercise, which according to the participants here, it is harder to do when working nights.

Limitations

This is a small-scale, purely descriptive, study, with 32 participants. While the results of the study are very informative and contribute toward filling the gap in knowledge about the health effects and practices of nurses working the night shift, further interpretation of the results are limited by the small number of participants. Additional quantitative research, including qualitative inquiry would be very useful in future studies.

Conclusion and Recommendations

Findings of this descriptive research survey indicate that further investigation needs to be done regarding the effectiveness of interventions used by night shift employees to get an adequate enough amount of sleep before their night shifts. In this study, 47% of RNs who participated reportedly used physical aids such as an eye mask, closed blinds, and ear plugs to help them sleep. Along with that, 28% reported using over the counter medications like melatonin, or prescribed medication such as Lunesta and 12.5% reporting they used natural and

herbal remedies (teas and essential oils). However, despite all these different kinds of interventions, 78% of participants reported getting less than 5 hours of sleep, and 28% reported getting less than 3 hours of sleep, indicating that these interventions are largely not working in helping the nurses achieve the 7-9 hours of daily recommended sleep. This lack of sleep likely has an impact on the 47% of participants reporting that they believe their performance would drop if they did not have the aid of caffeinated or high sugar beverages, and an additional 19% reporting that they are not confident in their ability to perform their nursing duties safely and efficiently without the use of caffeinated beverages due to their lack of energy and sleep. Along with the need for more research on effective interventions for helping nurses who work the night shift get more sleep, night shift nurses could potentially benefit greatly from further counseling and education on not just why it is important to eat healthy and exercise, but how they can translate these healthy practices over to when they are working the night shift as well. As indicated in the results, 81% of individuals found that using premade meals made it easier for them to maintain a healthy diet, but only 47% of participants reported using premade meals as their main meal during night shift over the past 30 days, and only 34% reported focusing on incorporating proper nutrients into these premade meals. Programs provided by employers and institutions could potentially greatly aid night shift employees in putting together nutritious meal plans in a timely manner that can be used regularly for their night shifts. One study used personalized dietetic counseling for their night shift employees and follow up showed a large jump in compliance with the implementation of healthy eating habits in their night shift employees (Gusto et al., 2015). This shows that with the right guidance, employees on the night shift are more than willing and capable to make the changes needed in order to be healthier.

References

- Aisbett, B., Condo, D., Zacharewicz, E., & Lamon, S. (2017). The Impact of Shiftwork on Skeletal Muscle Health. *Nutrients*, 9(3), 248. <https://doi.org/10.3390/nu9030248>
- Almeida, C. M., & Malheiro, A. (2016). Sleep, immunity and shift workers: A review. *Sleep science (Sao Paulo, Brazil)*, 9(3), 164–168. <https://doi.org/10.1016/j.slsci.2016.10.007>
- Costa G. (1996). The impact of shift and night work on health. *Applied ergonomics*, 27(1), 9–16. [https://doi.org/10.1016/0003-6870\(95\)00047-x](https://doi.org/10.1016/0003-6870(95)00047-x)
- Dijk, D. J., & Czeisler, C. A. (1994). Paradoxical timing of the circadian rhythm of sleep propensity serves to consolidate sleep and wakefulness in humans. *Neuroscience letters*, 166(1), 63–68. [https://doi.org/10.1016/0304-3940\(94\)90841-9](https://doi.org/10.1016/0304-3940(94)90841-9)
- Enriquez, A., & Frankel, D. S. (2017). Arrhythmogenic effects of energy drinks. *Journal of cardiovascular electrophysiology*, 28(6), 711–717. <https://doi.org/10.1111/jce.13210>
- Esquirol, Y., Bongard, V., Mabile, L., Jonnier, B., Soulat, J. M., & Perret, B. (2009). Shift work and metabolic syndrome: respective impacts of job strain, physical activity, and dietary rhythms. *Chronobiology international*, 26(3), 544–559. <https://doi.org/10.1080/07420520902821176>
- Folkard, S., & Akerstedt, T. (2004). Trends in the risk of accidents and injuries and their implications for models of fatigue and performance. *Aviation, space, and environmental medicine*, 75(3 Suppl), A161–A167.

- Ghiasvand, M., Heshmat, R., Golpira, R., Haghpanah, V., Soleimani, A., Shoushtarizadeh, P., Tavangar, S. M., & Larijani, B. (2006). Shift working and risk of lipid disorders: a cross-sectional study. *Lipids in health and disease*, 5, 9. <https://doi.org/10.1186/1476-511X-5-9>
- Gusto, G., Vol, S., Lasfargues, G., Voisin, V., Bedouet, M., Leglu, C., Grenier, B., Copin, N., Lantieri, O., & Tichet, J. (2015). Promouvoir un meilleur comportement nutritionnel chez les travailleurs postés avec horaires de nuit [Promote better nutritional behaviours among shift workers with night shift]. *Presse medicale (Paris, France : 1983)*, 44(5), e191–e201. <https://doi.org/10.1016/j.lpm.2014.09.024>
- Johnson, A. L., Jung, L., Song, Y., Brown, K. C., Weaver, M. T., & Richards, K. C. (2014). Sleep deprivation and error in nurses who work the night shift. *The Journal of nursing administration*, 44(1), 17–22. <https://doi.org/10.1097/NNA.0000000000000016>
- Knutsson, A., & Kempe, A. (2014). Shift work and diabetes--a systematic review. *Chronobiology international*, 31(10), 1146–1151. <https://doi.org/10.3109/07420528.2014.957308>
- Medic, G., Wille, M., & Hemels, M. E. (2017). Short- and long-term health consequences of sleep disruption. *Nature and science of sleep*, 9, 151–161. <https://doi.org/10.2147/NSS.S134864>
- Noordzij, M., Uiterwaal, C. S., Arends, L. R., Kok, F. J., Grobbee, D. E., & Geleijnse, J. M. (2005). Blood pressure response to chronic intake of coffee and caffeine: a meta-analysis of randomized controlled trials. *Journal of hypertension*, 23(5), 921–928. <https://doi.org/10.1097/01.hjh.0000166828.94699.1d>

- Peplowska, B., Burdelak, W., Krysicka, J., Bukowska, A., Marcinkiewicz, A., Sobala, W., Klimecka-Muszyńska, D., & Rybacki, M. (2014). Night shift work and modifiable lifestyle factors. *International journal of occupational medicine and environmental health*, 27(5), 693–706. <https://doi.org/10.2478/s13382-014-0298-0>
- Pimenta, A. M., Kac, G., Souza, R. R., Ferreira, L. M., & Silqueira, S. M. (2012). Night-shift work and cardiovascular risk among employees of a public university. *Revista da Associacao Medica Brasileira (1992)*, 58(2), 168–177.
- Regina Corso Consulting for Kronos, Nurses and Fatigue Survey Report (April 2017). 1
<http://www.nsinursingsolutions.com/Files/assets/library/retention-institute/NationalHealthcareRNRetentionReport2017.pdf>
- Saghir, Z., Syeda, J. N., Muhammad, A. S., & Balla Abdalla, T. H. (2018). The Amygdala, Sleep Debt, Sleep Deprivation, and the Emotion of Anger: A Possible Connection?. *Cureus*, 10(7), e2912. <https://doi.org/10.7759/cureus.2912>
- Shy, B. D., Portelli, I., & Nelson, L. S. (2011). Emergency medicine residents' use of psychostimulants and sedatives to aid in shift work. *The American journal of emergency medicine*, 29(9), 1034–6.e1. <https://doi.org/10.1016/j.ajem.2010.06.004>
- Spaeth, A. M., Dinges, D. F., & Goel, N. (2013). Effects of Experimental Sleep Restriction on Weight Gain, Caloric Intake, and Meal Timing in Healthy Adults. *Sleep*, 36(7), 981–990. <https://doi.org/10.5665/sleep.2792>
- Spiegel, K., Leproult, R., & Van Cauter, E. (1999). Impact of sleep debt on metabolic and endocrine function. *Lancet (London, England)*, 354(9188), 1435–1439. [https://doi.org/10.1016/S0140-6736\(99\)01376-8](https://doi.org/10.1016/S0140-6736(99)01376-8)

- Szosland D. (2010). Shift work and metabolic syndrome, diabetes mellitus and ischaemic heart disease. *International journal of occupational medicine and environmental health*, 23(3), 287–291. <https://doi.org/10.2478/v10001-010-0032-5>
- Wang, F., Zhang, L., Zhang, Y., Zhang, B., He, Y., Xie, S., Li, M., Miao, X., Chan, E. Y., Tang, J. L., Wong, M. C., Li, Z., Yu, I. T., & Tse, L. A. (2014). Meta-analysis on night shift work and risk of metabolic syndrome. *Obesity reviews : an official journal of the International Association for the Study of Obesity*, 15(9), 709–720. <https://doi.org/10.1111/obr.12194>
- Warburton, D. E., Nicol, C. W., & Bredin, S. S. (2006). Health benefits of physical activity: the evidence. *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne*, 174(6), 801–809. <https://doi.org/10.1503/cmaj.051351>

Appendix I



Side_Effects_of_Working_the_Night_Shift_What_Methods_Are_Nurses_Using_to_Combat_These_Side_Effects.pdf