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The Impact of Shift Work on Diabetes Self-management Activities

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THE IMPACT OF SHIFT WORK ON DIABETES SELF-MANAGEMENT
ACTIVITIES: A DOCTOR OF NURSING PRACTICE
PROJECT

By

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2008

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A doctoral document submitted in partial fulfillment
of the requirements for the

Doctor of Nursing Practice

School of Nursing
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The Graduate College

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We recommend the doctoral project prepared under our supervision by

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ABSTRACT

The Impact of Shift Work on Diabetes Self-management Activities: A Doctor of Nursing Practice Project

By

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In the United States 26 million people are affected by diabetes, which can result in microvascular and macrovascular complications. As a consequence, once a person is diagnosed with diabetes, aggressive clinical management is imperative to minimize poor glycemic control's devastating outcomes. However, for some patients reaching optimum blood glucose levels is challenging due to the complexity of diabetes' care. In order for patients with diabetes to achieve good blood glucose control, they must engage in self-care activities that include routine blood glucose checks, dietary control, physical activity, and routine medical provider visits, simultaneously with their medication regimen. Diabetes associated self-care activities aimed to reach good blood glucose control can be hindered by multiple factors – one of them being shift work. Thus, by better understanding the impact that shift work has on diabetes care, health care providers can formulate meaningful treatment plans to meet the needs of each diabetic patient – including diabetic evening/night workers who face additional challenges.

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TABLE OF CONTENTS

ABSTRACT..... iii

ACKNOWLEDGEMENTS..... iv

CHAPTER 1 INTRODUCTION1

 Purpose of the Project3

 Problem Statement3

 Project Questions4

CHAPTER 2 REVIEW OF RELATED LITERATURE.....9

 Population Identification.....12

 Key Stakeholders12

 Significance and Financial Implications13

CHAPTER 3 PROJECT PLAN AND METHODOLOGY14

 Goal.....14

 Setting and Sample14

 Instrumentation15

CHAPTER 4 RESULTS21

CHAPTER 5 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS27

 Evaluation and Recommendations.....27

APPENDIX A DETAILED TIMELINE37

APPENDIX B COPY OF DSMQ INSTRUMENT38

APPENDIX C COPY OF DEMOGRAPHIC/SUPPLEMENTAL QUESTIONNAIRE
..... 39-40

APPENDIX D LETTER OF SUPPORT FROM NEM MEDICAL CENTER41

APPENDIX E IRB APPROVAL LETTER.....42

APPENDIX F EXEMPT STUDY INFORMATION SHEET/CONSET43

APPENDIX G APPROVAL TO USE DSMQ INSTRUMENT.....44

REFERENCES45

CURRICULUM VITAE.....52

CHAPTER 1

INTRODUCTION

Diabetes mellitus (DM) is a chronic health condition with the potential to affect an individual's sense of wellness. Diabetes often cohabits with other conditions including hypertension, hyperlipidemia, obesity, depression, and painful neuropathy (Unger, 2013). After a person has been diagnosed with DM, aggressive clinical management is important to minimize devastating consequences of poor glycemic control. To that end, health care professionals incorporate not only pharmacological interventions but also lifestyle behavior modifications in patients' treatment plans. The purpose of this study is to evaluate self-management activities of diabetic individuals who undertake shift work.

Diabetes mellitus is a condition where there is a presence of elevated blood glucose due to a lack of, and/or diminished, insulin production (Unger, 2013). Patients with diabetes are mainly categorized in two groups, those having either Type 1 or Type 2 diabetes. Both, Type 1 and Type 2 diabetes are considered chronic illnesses that can influence a person's sense of wellness because the treatments are taxing and can result in microvascular and macrovascular complications (Jacobson, De Groot, & Samson, 1994).

Shift work has been associated with increased risk of chronic diseases including cardiovascular disease, metabolic syndrome and DM (Wang, Armstrong, Cairns, Key, & Travis, 2011). Yet, the association of shift work and well controlled diabetes is not well understood. One study suggested an association of poor control of DM with shift work (Young, Waclawski, & Spencer, 2013). Another study by Knutson, Ryden, Mander, & Van Cauter (2006) suggested the possibility of a relationship between the quantity or quality of sleep and optimum blood glucose control in diabetic patients. Trief, Aquilino,

Paradies, & Weinstock (1999) found a relationship between work variables and psychosocial adaptation in diabetic adults treated with insulin. On the other hand, another study found no direct correlation between shift work and DM control (Poole, Wright, & Natrass, 1992).

Shift work is becoming prevalent in contemporary life, especially in industrialized countries (Szosland, 2010). The term shift work customarily refers to rotating shifts, fixed night time shifts, split shifts, on call schedules, or work hours other than the standard hours of 8 a.m. to 5 p.m. (Guo et al., 2013; Szosland, 2010). Shift work is generally associated with health misalignment including circadian rhythm disruption, lifestyle changes, job strain and stress, and social stress. Furthermore, there is a significant amount of data associating shift work with chronic health conditions such as metabolic disorders, diabetes, and cardiovascular diseases (Szosland, 2010; Wang et al, 2011; Pan, Schernhammer, Sun, & Hu, 2011).

Individuals with diabetes and poor blood glucose control can expect greater morbidity and a shorter life expectancy (Szosland, 2010). In addition, a person with DM has higher expenses compared to an individual without DM. According to the Centers for Disease Control and Prevention (CDC), in 2007 the estimated patient cost of diabetes was \$174 billion. According to the Centers for Disease Control (CDC), of the \$174 billion, an estimated \$58 billion represented indirect costs such as disability, productivity loss, and premature death (*Diabetes report card 2012*, 2012).

In summary, from the perspective of attaining desirable clinical outcomes, the negative effects of poorly controlled diabetes must be minimized. In order to formulate effective strategies to assist patients to achieve optimum glucose control, there is a need

to systematically review the factors that contribute to diabetes self-care activities associated with blood glucose control. An understanding of the predictive value of these factors would help advanced practice nurses to formulate care plans tailored to address their diabetic patients' specific needs.

Purpose of the Project

The purpose of this project is to examine evening/night workers with diabetes' self-care management activities such as glucose management, dietary control, physical activity, and health-care utilization associated with diabetes, in comparison to daytime workers. In addition, an added purpose is to identify if a difference of perception exists between evening/night workers and non-daytime workers for quality of sleep and diabetes self-management.

By understanding evening/night workers with diabetes self-care management activities barriers and assumptions, clinical health care providers will be better equipped to formulate customized treatment plans designed to encourage adaptation of self-care activities aimed to maximize wellness and minimize DM related complications.

Problem Statement

Evening/night workers with diabetes face an uphill challenge regarding self-management activities including glucose management, dietary control, physical activity, and accessing health care services. Depending on the type of DM, many patients with diabetes have to check their blood glucose levels two to four times each day, count carbohydrates, self-inject insulin, and/or take oral medications, and exercise a minimum of five days a week for at least 30 minutes (i.e., 150 minutes per week). Also, they have to attend primary health care provider visits at least every three months until good blood

glucose control is achieved – then every 6 months – and, visit other specialists (i.e., podiatrist, dentist, nephrologist, ophthalmologist, certified diabetic educator, and registered dietitians) at least once or twice per year.

Current research supports the idea that good self-care management activities helps to minimize diabetes complications and achieve good blood glucose control (Spellman, 2009; Williams, McGregor, Zeldman, Freedman, & Deci, 2004). However, optimum diabetes control presents special challenges to patients and their families due to the complexity of treatments and lifestyle modifications required. Poor diabetes management can lead to microvascular and microvascular complications (Spellman, 2009). Spellman points out research data supporting the benefits of tight glycemic control to reduce DM complications such as retinopathy, nephropathy, and neuropathy for both Type 1 and Type 2 DM. Spellman also indicates that tight glycemic control reduces myocardial infarction, strokes, and death in young individuals with Type 1 diabetes. An understanding of the patient with diabetes self-management activities may aid in establishing a personalized plan of care to improve diabetes control.

Project Questions

This project will address the following questions:

1. Is there a difference in perception between daytime workers with diabetes and evening/night workers with diabetes for self-management activities of Type 2 DM?
2. Is there a difference in perception between daytime workers with diabetes and evening/night workers with diabetes about their quality of sleep?

Definition of Terms

This project will address the following terms:

- Diabetes self-management activities encompass a group of day-to-day activities practiced by patients with diabetes in order to achieve optimum diabetes control.

Examples of these self-management activities include: (1) dietary control, (2) self-blood glucose monitoring, (3) adherence with medication regimen, (4) being physically active, and (5) healthcare utilization (Shrivastava, Shrivastava, & Ramasamy, 2013; Schmitt, Gahr, Hermanns, Kulzer, Huber, & Haak, 2013).

- Daytime shift work is defined as a standard daytime work schedule (e.g., 8 a.m. to 5 p.m.).
- Shift work is not clearly defined by the literature. For the purpose of this study, shift refers to a job schedule in which employees are scheduled to work hours outside standard daytime hours; for example, a work schedule between 8 a.m. to 5 p.m. (Szoland, 2010; Mohammadi, Ahmad El Saghier, Ramadan, 2014).

Policy Implications

The Affordable Care Act (ACA) includes several provisions that directly address gaps in diabetes prevention, care and treatment (National Center for Chronic Disease Prevention and Health Promotion, 2012). Self-management activities have important implications for patients with diabetes. The assessment of patients with diabetes self-care management should be an essential component of healthcare practice. Applying self-care management training to current clinical practice guidelines is an appropriate approach to improve knowledge in self-management and to maximize treatment efficacy. It is hoped

that interpretation and publication of this data can expand the current body of knowledge regarding diabetes to identify health policies and legislation aimed to improve diabetes care outcomes.

Theoretical Frameworks

Many scholars and writers have recognized that the connection between theory and practice is essential to the nursing profession. In recent years, several nurse theorists have developed models and theories for nursing, which contribute to the advancement of nursing science. McEwen and Wills (2007) addressed the question of whether the application of theory is relevant to clinical practices. They acknowledge that utilization of nursing theories in practice can assist health care providers resolving problems, implementing primary health care, handling ethical issues, managing care, communicating, and in applying legislation (McEwen & Wills, 2007). With the underlying premise that nursing theory guides practice, Betty Neuman Systems Model serves to guide this project. The Neuman Systems Model is an open system specifically related to client, environment, health, and nursing (Neuman, 1995). Neuman utilizes a holistic approach to client care, which views the physiological, psychological, developmental, sociocultural and spiritual variables as interacting with each other. In addition, Neuman indicates that flexible, normal, and resistant lines of defense protect the client.

This wellness based model focuses on stress and reaction to stressors within the total environment. Neuman defines the environment as internal and external influences (1995). The three environments identified by Neuman are internal, external, and created – which can positively or negatively affect the client. The internal influences are

contained within the boundaries of the client's system – in other words, they are intrapersonal in nature. The external influences exist outside the client; and, the created environment is developed unconsciously by the client.

The purpose of Neuman's model is to help nurses organize the nursing field within a broad systems perspective. The following are the basis of assumptions of the Neuman Model: (1) Nursing is concerned with the total person, (2) Appropriate responses to stressors are relative to each client, (3) Nurses assist clients to achieve their highest level of stability, (4) The prime source of data for nursing is derived from the meaning of stress factors to clients, (5) The relevance and significance of nursing outcomes depend on the accuracy and comprehensiveness of the assessment, and, (6) The nurse-client relationship is a collaboration with both personal and professional responsibility for individuals' health (Neuman, 1995).

Health is viewed as having optimal system stability. In such a system, all variables are in harmony with each other (Neuman, 1995). The nursing component of the model is keeping the client's system stable. Per Neuman, nursing actions are aimed at helping the client attain, retain, and maintain optimal health or wellness. In addition, the Neuman Systems model considers and includes primary, secondary, and tertiary nursing interventions.

Primary prevention intervention is used to maintain wellness, with the main goal of promoting the client's wellness and reducing risk factors. The secondary prevention intervention is used as wellness achievement and early identification of illness. Therefore, the goal is early identification of symptoms so treatment can begin early to reach potential wellness. Finally, tertiary prevention intervention is used to return to

wellness following treatment. Generally speaking, the main goal of all prevention as interventions is to improve the patient's quality of life and reduce early death. Betty Neuman's Systems Model is relevant to a variety of chronic diseases that require long-term lifestyle adjustments and modifications.

This module is relevant to the project in evaluating patients with diabetes' ability to attain, retain, and regain an optimal level of wellness. To improve patients' senses of wellness, interventions can be implemented with the goal of strengthening the flexible and resistant lines of defense. Such interventions are within the construct of primary, secondary, and tertiary interventions. These include: (1) Assistance in retaining and maintaining coping strategies. This intervention is employed by discussing self-care stimulation practices (e.g., routine health care checkups, rest, exercise, and health screening); (2) Collaboration with other health care providers, specialists, registered dietitian, referral to community out-reach programs and support groups; (3) DM education related to prognosis, care, and treatment complexity; (4) Development of a realist view of the seriousness of DM; (5) Addressing anxiety related to diagnoses by allowing the patient to express fears and concerns; (6) Application of culturally sensitive and holistic interventions; and (7) Emphasis on behavioral modifications such as routine physical exercise and dietary modifications.

Betty Neuman's system model provides a framework for health care providers to assist their patients, and to retain and/or attain optimal health wellness. It focuses on the client's response to actual or potential effects of environmental stressors. In addition, the client is being assisted to achieve the best possible health status at a particular point in time via the utilization of primary, secondary, and tertiary nursing interventions.

CHAPTER 2

REVIEW OF RELATED LITERATURE

Indication from the literature suggests that evening/night workers are at higher risk for developing several health problems including metabolic syndrome, cardiovascular diseases, dyslipidemias, and diabetes (Zimberg et al., 2012; Wang et al., 2011; Guo et al., 2013). Additionally, current literature suggests that shift work hinders the management of diabetes (Young et al., 2012). Standard of practice supports that good blood glucose control is essential to minimize multi-organ systems complications (Schmitt et al., 2013; Spellman, 2009). In order for diabetic patients to achieve optimum blood glucose levels, they must engage in self-care activities such as: (1) routine blood glucose checks, and (2) prescribed management (i.e., dietary control, physical activity, and routine medical provider visits, simultaneously with their medication regimen).

Different factors contribute to blood glucose control including environmental factors such as shift work. Several studies have concentrated on the impact that shift work has on people with DM (Young et al., 2012). There is a significant amount of data pointing to an association between shift work and of optimal control of chronic health conditions. Shift work is associated with higher prevalence of metabolic syndrome (Szosland, 2010). Kroenke and associates (2007) found a positive correlation between the development of Type 2 DM and the number of shift-work hours worked in young and middle-aged women. Knutson, Ryden, Mander, & Van Cauter's (2006) study showed the likelihood that the quality of sleep and lack of sleep could negatively affect glucose control in diabetic condition. Pan et al. (2011) suggested exposure to prolonged periods of rotating shift work was linked to increased risk of Type 2 diabetes in women. Suwazono et al.

(2006) studied the effects of shift work on glycated hemoglobin (HbA1C) levels. The researchers identified a dose-response relationship between the time spent in shift work and an increase in HbA1C. Young et al. (2013) showed shift work was linked to poorer control in individuals with Type 1 diabetes.

It is important to mention that some studies found no direct association between shift work and diabetic control. For example, Tied et al. (1999) found no direct correlation between glycemic control and work variables in adults with diabetes treated with insulin; but, they found a correlation between psychosocial adaptation and work variables. Poole, Wright and Natrass (1992) concluded from their study that glucose control in shift working diabetic subjects treated with insulin was no worse off than those who work the day shift. The researchers concluded slow changes in rotating shifts were linked with better diabetic control compared to more rapidly rotating shifts.

Current literature supports the notion that shift work has the potential to negatively affect a person's quality of sleep. Poor quality of sleep has been associated with several health misalignments. LaDoue (1982) indicates that the main health risk factors associated with shift work are sleep disturbance and altered eating patterns. A study by Zimberg et al. (2012), Fernandez Junior, Crispim, Tufik, & Tulio de Mello (2012) points out alteration in individuals' patterns of physical activity, rest, and eating habits impact the circadian system. Szosland (2010) links the role of circadian rhythm as the main issue of health misalignment in evening/night workers. The circadian rhythm cycles approximately every 24 hours. It regulates multiple biological functions including sleep-wake cycles, body temperature, energy metabolism, hormone secretion, and normal cellular functions (Szosland, 2010).

Szosland (2010) points out that many evening/night workers lack complete physiological adaptation. This might be related to evening/night workers' challenge to reach optimum sleep habits and follow a healthy nutritional regimen. According to Ioja, Weir and Rennert (2012), quality and quantity of sleep is recognized as an essential element in the homeostasis of different body organs and their function. Ioja and associates explain that evening/night workers' quality of sleep is affected by: (1) disturbance in chronological rhythms, (2) reduction of melatonin, and (3) some evening/night workers have to sleep during the daytime – during which sleep could be impaired by bright light and/or increased noise levels.

In addition, Zimberg and colleagues explain that evening/night workers who experience poor quality and quantity of sleep are more likely to experience fatigue and excessive daytime sleepiness (2012). The aforementioned could result in diabetic evening/night workers reducing physical activity and becoming more engrossed in sedentary lifestyle. Additionally, circadian activity also appears to affect evening/night workers' dietary habits. Nedeltcheva et al.'s (2010) study concluded that lack of sleep may hinder the effectiveness of typical dietary interventions. The authors study found that sleep restrictions resulted in an increase in hunger, snacking, and caloric intake.

In summary, patients with diabetes required major lifestyle changes including dietary changes and physical exercise. Patients with diabetes also need routine medical visits and frequent blood glucose monitoring. Individuals engaged in shift work may find diabetic self-management activities more difficult and challenging. Although shift work has been associated with increasing the risks for cardiovascular diseases, metabolic syndrome, diabetes, circadian rhythms disturbance, and exacerbation of chronic health

conditions, there is not enough research done to assess the impact of shift work on diabetic self-management activities. As a result, there is a need to better understand the potential barriers of diabetic individuals undertaking shift work to self-manage their diabetes. By doing so, medical health providers can individualize treatment plans that are in synchrony with better patient outcomes in spite of the fact that their work occurs during non-traditional shifts.

Population Identification

Individuals with Type 2 DM who undertake daytime shift work and evening/night time shift work were approached in a primary care clinic located in Las Vegas, Nevada, to participate in this project.

Key Stakeholders

The following are the main stakeholders of this project:

- Patients with DM
- Medical providers (e.g., physicians, nurse practitioners, nurses, registered dietitians)
- Insurance companies including Medicaid and Medicare

Available Resources

The resources used for this project include the use of library materials such as textbooks, online databases, and available literature related to the project. The investigator applied for the Ph.D./DNP Student Dissertation/Project Award from the University of Nevada, Las Vegas School of Nursing to support the financial cost to carry out this project (i.e., printings, pens, pencils, consultation fees, etc.). The project's participants did not receive any incentives for their participation in the project.

Significance and Financial Implications

According to the CDC, diabetes affects 26 million people in the United States (8.3 % of the U.S population) and approximately 79 million U.S residents have pre-diabetes. Based on the CDC National diabetes fact sheet, DM is the leading cause of: kidney failure, non-traumatic limb amputation, heart disease, strokes, and blindness in the U.S (CDC National Diabetes Fact Sheet, 2011).

The CDC indicates that a person with DM has higher medical expenses compared to individuals without DM. For example, per the CDC Diabetes Report Card, in 2007 the estimated cost of diabetes care was \$174 billion – including both direct and indirect medical costs. Of the \$174 billion, an estimated \$58 billion represented indirect costs alone including: disability, productivity loss, and premature death (CDC diabetes report card 2012, 2012).

Based on The Institute for Alternative Future (IAF), in 2010, there were 278,100 individuals living with diabetes in Nevada. By the year 2025, the IAF estimates the overall number of people in Nevada living with diabetes will increase from 278,100 to 570,100. For Nevadans, the resulting diabetes medical care cost will be \$5.5 billion (Institute for Alternative Futures [IAF], 2011)

These projections provide a discouraging scenario and an insight into the potential threat imposed by diabetes at the individual and societal level. The costs associated with diabetes care could be reduced by minimizing diabetes related complications (Unger, 2013); and, this can be accomplished if clinical providers can create treatment plans to meet the needs of each diabetic patient – including diabetic evening/night workers who face additional challenges.

CHAPTER 3

PROJECT PLAN AND METHODOLOGY

Goal

This project's goal is to assess the self-management activities of sample patients with Type 2 diabetes who are evening/night workers, in order to customize treatment plans designated to promote adherence to healthy lifestyle changes and self-management activities that minimize diabetes related complications.

Objectives

This project's objectives include two main areas of focus:

1. To identify the ability for self-management activities of Type 2 diabetic daytime workers compared to evening/night workers.
2. To identify if a difference of perception exists between evening/night workers and daytime workers for quality of sleep and self-management activities.

Design

This was a descriptive cross-sectional study using one outpatient primary care clinical site and two groups (daytime workers and evening/night workers).

Setting and Sample

The study took place in an outpatient primary care clinic in Las Vegas, Nevada. The clinic provides family healthcare services. A total of 86 patients – daytime workers ($N=45$) and evening/night workers ($N=41$) – with Type 2 diabetes met the study criteria and participated in the study. The two groups were randomly selected from the data collection site's patient- panel list.

Inclusion Criteria

All eligible participants met the following criteria:

- Must be 21 years of age and older
- Diagnosed with Type 2 diabetes
- Able to read English at approximately the 5th grade level
- Willing to participate
- Worked for at least 1 year doing evening/night work or daytime work

Exclusion Criteria

The following individuals were excluded from participating:

- Individuals less than 21 years of age
- People with diabetes who have suffered a stroke or myocardial infarction
- Individuals with psychiatric disorders, taking psychotropic medications, or cognitive impaired
- Non-English speaking individuals
- Non-working individuals

Instrumentation

The study used the Diabetes Self-Management Questionnaire (DSMQ) (see Appendix B). The instrument was designed at the Research Institute of Diabetes Academy Mergentheim. The DSMQ can be utilized to assess diabetic patients' self-management behaviors associated with diabetes control (Schmitt et al., 2013). The instrument has four subscales measuring glucose management (GM), dietary control (DC), physical activity (PA) and health-care use (HCU). The DSMQ's reliability is acceptable. Reliability analysis showed an overall Cronbach's Alpha of 0.84 and the subscales' Cronbach's were

(GM) 0.77, (DC) 0.77, (PA) 0.76, and HCU 0.60. The factorial validity accounted for 60% of the variance (Schmitt et al., 2013).

In addition, to the DSMQ, additional information was collected using a demographic/supplemental questionnaire which was developed by the doctor of nursing practice (DNP) student. The demographic/supplemental questionnaire collected data such as: participant's age, gender, ethnicity, number of years in current employment, number of years working shift work, educational level, marital status, type of diabetes, number of years with diabetes, weight, height, and body mass index (BMI). In addition, the demographic/supplemental questionnaire surveyed the patient's perceived quality of sleep (e.g., average hours of sleep, difficulty falling asleep, and difficulty staying asleep), engagement in spiritual activity, and psychosocial support to manage their diabetes (see Appendix C). Permission was obtained to utilize the DSMQ instrument (see Appendix G).

Project Tasks and Procedures

After receiving approval from the DNP project committee to proceed with the project, Internal Review Board (IRB) approval was sought from the University of Nevada, Las Vegas. Once IRB approval was obtained, participant recruitment began. A meeting was held with the clinical site staff to solicit their assistance in identifying individuals who met the project inclusion criteria. The clinical staff agreed to participate and they were trained regarding the project goals, objectives, and the procedure to recruit participants.

Patients with Type 2 DM who undertake daytime work and evening/night work were approached to participate in the study. The potential participants were informed of the purpose of the project, the expectations of the participants regarding their participation,

and, any questions they had were answered. They were told there was only minimal anticipated risk for participating and refusal to participate was not going to compromise their relationship with the clinic nor will it affect the quality of care provided by the clinic. If potential participants acknowledged they would like to be involved, they were provided with a copy of the study information sheet (see Appendix F). The IRB gave this study a determination of exempt status. Participant's signed written consent was not required. Nevertheless, participants were told that by completing the questionnaires they were giving consent to participate in the study.

After obtaining informed verbal consent, participants were asked to complete the self-administered DSMQ instrument and demographic/supplemental questionnaires. Participants were told they do not have to answer any question which made them uncomfortable. Participants were informed that they could withdraw from the study at any time simply by returning the unanswered questionnaires. This process continued until the sample size ($N= 86$) was reached.

Participants' information was treated confidentially and neither their names nor personal identification appeared on the questionnaires. Instead, a code number, which was not linked to participant's information, was assigned to each participant. Also, participants were reassured that any publication resulting from this project would be reported in aggregate form only; therefore, individuals participating will not be identified.

The investigator was present to answer questions by the participants as they arose. After completing the questionnaires, participants placed the questionnaires inside a manila envelope. Each questionnaire was destroyed after the data was entered into Scientific Package for Social Sciences (SPSS, 23.0 or latest version) for analysis.

IRB approval.

This study was approved by the Internal Review Board (IRB) at the University of Nevada Las Vegas, on April 08, 2015 (see Appendix E). The IRB gave this study an exempt status [number 724265] (see Appendix F).

Risks and threats.

There were minimum risks in participating in this project – such as the patient feeling uncomfortable with some, or any, of each of the questionnaires' questions.

Project timeline.

The following project timeline excerpt is also thoroughly delineated in Appendix A:

April 2014

- Project proposal defended
- Proposal revisions

December 2014

- Applied for Institutional Review Board (IRB) approval

April 2015-May 2015

- Once IRB approval was obtained, data collection started
- Analyzed the data for each project question

May 2015

- Developed recommendations for intervention
- Completed DNP project paper
- Presented findings to providers and staff at the respective medical practice
- Defended DNP project
- Submitted final paper to the Graduate College with plans to publish results

Resources

Permission and support from NEM Medical Center's owner to carry out this project was obtained (see Appendix D). There were no financial incentives to participants or the owner of medical center where the DNP project is going to take place.

The DNP student applied for the \$2000 Ph.D./DNP Student Dissertation/Project Award from the University of Nevada, Las Vegas School of Nursing to help defray the financial cost to carry out this project (i.e., printings, pens, pencils, consultation fees, etc.).

Data analysis.

Statistical analyses were performed by using the Statistical Package for Social Sciences (SPSS 23.0 version) software program to analyze study questions 1 and 2. A statistical consultation was sought to assist with all data analysis. A series of independent *t* test and chi-square tests were conducted.

The clinical questionnaire Diabetes Self-Management Questionnaire (DSMQ) assesses DM self-care activities associated with glucose control including glucose management (GM), dietary control (DC), physical activity (PA), and health-care use (HU). Independent *t* tests were used to analyze data obtained from the DSMQ data set to test if there was a difference in perception between daytime workers with diabetes and evening/night workers with diabetes for self-management activities of Type 2 DM. In addition, a Cronbach's analysis was performed for each DSMQ instrument's subscale and overall scale to check the DSMQ instrument's reliability.

Another questionnaire (demographic/supplemental questionnaire) captured demographic data such as age, gender, ethnicity, level of education, marital status, type of

diabetes, weight, height, and BMI. The demographic/supplemental questionnaire items with dichotomous response (e.g., yes, no) were dummy coded, with 1= yes and 0= no. Missing responses were coded as 999 to avoid affecting that item's mean score. Descriptive statistics (means, standard deviation, and frequencies) were used to analyze the demographic characteristics of the study sample.

The demographic/supplemental questionnaire also captured patients' sleep information (i.e., average daily number of sleep hours, difficulty sleeping during day time, difficulty falling asleep, and difficulty staying asleep). An independent *t* test and chi-square tests were conducted to determine if there was a significant difference in quality of sleep between daytime workers and evening/night workers.

CHAPTER 4

RESULTS

A calculated $N= 64$ was determined for independent t tests based on a power of 0.8, alpha of 0.05 and effect size of 0.5. However, the data collection consisted of $N= 86$.

Demographic descriptive statistics, in the form of frequencies and percentages, were reported for all pertinent demographic variables, such as gender and ethnicity (see Table 1 for details). The age of the participants ranged from 36 to 64 years ($M= 51.94$, $SD= 5.78$).

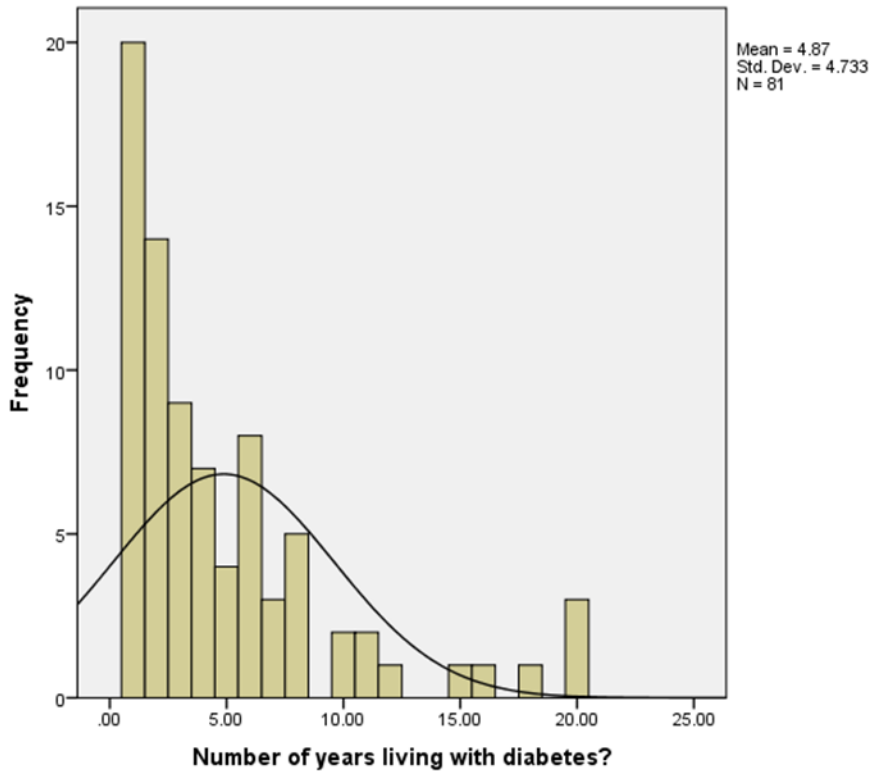
Table 1

Descriptive Statistics of the Sample

Variable	N (%)
Gender	
Male	57 (57%)
Female	43 (37%)
Ethnicity	
African American or Black Non-Hispanic	16 (18.6%)
Asian	8 (9.3%)
Hispanic	35 (41.2%)
White	20 (23.3%)
Other	6 (7%)
Marital Status	
Single	10 (11.6%)
Married	47 (54.7%)
Divorced	18 (20.9%)
Widowed	6 (7%)
Living with a partner/companion	5 (5.8%)
Standardized BMI	
Normal	6 (7.0%)
Overweight	37.2 (37.2)
Obese	48 (55.8)

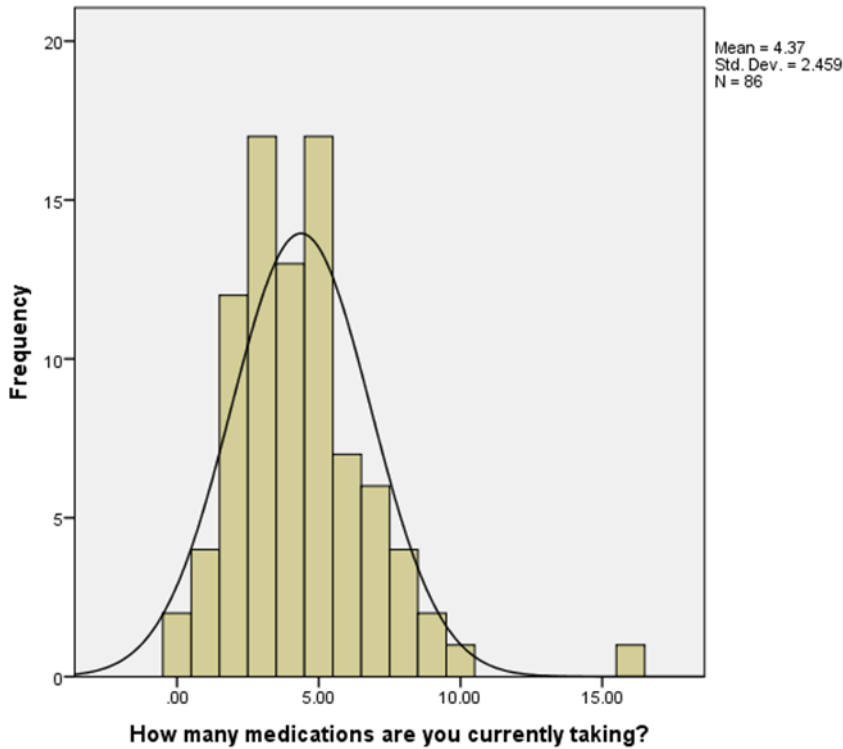
Of the 86 participants, 44 worked other than the 8 a.m. to 5 p.m. shift. The number of years doing shift work ranged from 1 to 35 – with the mean 15.37. Additionally, 85 of the 86 participants responded to the question “*How many years have you lived with diabetes?*” Participants responded 1 to 20 years ($M= 4.87$, $SD = 4.73$)

Figure 1. Number of Years Living With Diabetes



As the above graph depicts (see Figure 1), the majority of respondents were diagnosed with diabetes within the last 5 years. Additionally, 86 participants responded to the question “*How many medications are currently taking?*” The responses ranged from 0 to 16 with the mean of 4.37 (see Figure 2).

Figure 2. Current Number of Medications



To answer question 1 of the present study, “*Is there a difference in perception between daytime workers with diabetes and evening/night workers with diabetes for self-management activities of Type 2 DM?*”, an independent-samples t-test was conducted to compare self-management activities (glucose management [GM], dietary control [DC], physical activity [PA], and health-care use [HU]) between daytime workers and evening/night workers. There was not a significant difference between daytime workers and evening/night workers in the scores GM ($M= 5.62, SD= 1.03$) conditions; $t(79) = 1.40, p = 0.165$. There was a close to statistically significant differences between daytime workers and evening/night workers in the scores DC ($M= 5.03, SD= .97$) conditions; t

(73) = 1.9, $p = 0.058$. There was not a significant difference between daytime workers and evening/night workers in the scores PA ($M = 5.11$, $SD = 2.11$) conditions; $t(83) = -1.2$, $p = 0.21$. Finally, there was not a significant difference between daytime workers and evening/night workers in the scores HU ($M = 4.61$, $SD = 1.70$) condition; $t(84) = -1.3$, $p = 0.19$.

Internal consistency (Cronbach's alpha) for each DSMQ scale was conducted (see Table 2). Three of the four DSMQ subscales were acceptable (GM = .89, DC = .86, PA = .89). The Cronbach's alpha for HU was .69.

Table 2

Means and Standard Deviations of Comparison DMSQ Subscales Variables

Subscale	M	SD
Glucose Management Subscale	5.62	1.03
Dietary Control Subscale	5.03	0.97
Physical Activity Subscale	5.11	2.11
Healthcare Use Subscale	4.61	1.70

An independent-sample t-test and chi-square tests were conducted to analyze question 2 of this study, *“Is there a difference in perception between daytime workers with diabetes and evening/night workers with diabetes about their quality of sleep?”* Overall,

sleep variables were significant. An independent t test was used to analyze the participants' responses to the question "*How many hours do you sleep every day?*" There was a significant difference between daytime workers' and evening/night workers' self-reported number of sleep hours ($M=7.38$, $SD= 1.03$ vs. $M= 6.59$, $SD= 1.07$); $t(84) = 1.92$, $p= .001$. A series of chi-square tests were used to test the following questions: (1) "*Do you have trouble sleeping during the day time?*", (2) "*Do you have difficulty falling asleep?*", (3) "*Do you have difficulty staying asleep?*", and (4) "*Are you tired during awake hours?*" It was found that 39% of evening/night workers said they have trouble sleeping during the daytime, compared to 11% of the daytime workers. This finding was statistically significant ($X^2(1, N= 85) = 8.73$, $p = .003$). For the question "*Do you have difficulty falling asleep?*", 44% of evening/night workers reported having difficulty falling asleep compared to 18% of daytime workers ($X^2(1, N=86) = 6.94$, $p= .008$). In addition, 54% of evening/night workers said they have trouble staying asleep compared to 20% of day evening/night workers ($X^2(1, N= 86)= 10.54$, $p= .001$). Finally, in response to the question "*Are you tired or sleepy during awake hours?*", 76% of evening/night workers said yes compared to 29% of daytime workers – which was statistically significant ($X^2(1, N=86) = 18.74$, $p= < .001$).

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Evaluation and Recommendations

The aim of the current study was to explore the effects of shift work (daytime versus evening/night workers) on diabetes self-management activities and quality of sleep. This was done by comparing daytime workers and evening/night workers. Independent samples *t*-tests were conducted to assess the difference in self-reported diabetes management activities between the 2 groups. For glucose management, physical activity, and healthcare use, there were no significant differences between groups. The subscale dietary control was trending toward statistically significant between groups ($p= 0.058$). For those with diabetes, a shift work pattern requires necessary changes to meal times and eating habits. This has been linked to their poorer blood glucose control levels (Young, Waclawski, Young, & Spencer, 2013). The data from this study might have supported the findings of Young, Waclawshi, Young, & Spencer, if this study sample size of evening/night workers would have been larger.

This study also assessed the effects of shift work status on sleep quality. This was explored by comparing daytime workers and evening/night workers' self-reported perceived sleep related components. Daytime workers reported sleeping more hours on average than their shift worker counterparts ($M= 7.38$, $SD= 1.03$ versus $M= 6.59$, $SD= 1.07$). This is not surprising based on the current plethora of studies associating shift work with reduced sleep quality, by disturbing the circadian rhythms (Costa, 2010; Knutsson, 2003; Mohammadi, Ahmad El Sagnier, Ramadan, 2014).

The perceived difference between daytime workers and evening/night workers for the remaining sleep questions in this study (trouble sleeping during the day time, difficulty falling asleep, difficulty staying asleep, sleepiness during awake hours) are also not surprising results. These findings are congruent with previous studies which have suggested that most evening/night workers experience worse sleep patterns compared to daytime workers (Monk et al., 2012). Some contributory factors affecting evening/night workers' sleep include exposure to daylight and noise. In addition, evening/night workers may experience a lower melatonin secretion (Gumenyuk, Roth, & Drake, 2012).

Evaluation of Data Collection Site

Currently, Nem Medical Center provides basic diabetic education to its diabetic population. Patients receive both verbal and written educational material regarding diabetic self-care (e.g., dietary control, self-blood glucose monitoring, and weight management). Patients are scheduled for routine checks and follow-ups until an optimum HbA1C level is achieved. At the site, individuals are primarily seen by providers (e.g., medical doctors, advanced nurse practitioners, or physician assistants).

Recommendations

In order to master patient's diabetes self-management care and improve the diabetic patient's health outcome, one recommendation for Nem Medical Center is to adopt and implement a patient-centered medical home (PCMH) model to manage diabetes. The PCMH is a recognized evidence-based care frame work which has shown to be effective in chronic healthcare conditions (Bojadziewski & Gabbay, 2011).

The U.S health care system is experiencing significant challenges and complex paradigmatic shifts at multiple levels (e.g., implementation of the Affordable Care Act,

expansion of Medicaid funding, and targeted spending cuts). These require innovative approaches to care, and bringing to fruition the needed changes to the U.S healthcare system to make it economically sustainable. The PCMH model is an example of an innovative healthcare system initiative that has gained traction in recent years. It offers a patient-centered care approach to chronically ill patients in a comprehensive and coordinated platform. The Center for Medical Home Improvement (2015) defines PCMH “as a community-based primary care setting which provides and coordinates high quality, family-centered health promotion, acute illness care, and chronic conditions management across the life span” para. 2. Furthermore, the PCMH provides a venue to achieve the goal of transforming the U.S health care services from a provider-centric system with variable quality (volume-based) to a coordinated, patient-centered system that consistently, and cost effectively provides high quality care (value-based) (Kendall-Gallagher & Breslin, 2013).

Seven principles guide the PCMH model. These include an emphasis on: (1) the patient’s relationship with the primary care provider, (2) provider-led and team-based care, (3) the patient is a “whole-person” who requires comprehensive care at various stages of life, (4) integration and coordination of care, (5) quality and safety, (6) improved access to care, and (7) a payment system that accurately reflects the efforts and care provided by the team (Henderson, Princell, & Martin, 2012). Henderson, Princell, and Martin postulate that the PCMH model is transforming the delivery of healthcare in the United States. Another reason to support the implementation of a PCMH model in the primary care setting is because it promotes and cultivates interprofessional collaboration in the healthcare services arena.

Bridges and colleagues (2011) define interprofessional collaboration as the process which includes communication and decision-making, facilitating a synergistic influence of grouped knowledge and skills. Interprofessional collaboration between professionals and across disciplines has been linked with more clinically effective services, enhanced problem solving, reduced duplication services, as well as increased job satisfaction for healthcare professionals (Mitchell, Parker, Giles & White, 2010).

Interprofessional collaboration with other members of the health-care team is an essential activity of the PCMH model. It facilitates excellent healthcare delivery and coordination of services for patients and their families. In addition, interprofessional collaboration improves communication among healthcare professionals.

Interprofessional collaboration is transformative because the process allows two or more professionals to interact authentically and constructively with each other in order to improve patients' care outcomes.

This study showed a significant difference in self-reported quality of sleep between daytime workers and evening/night workers. Shift work has the potential to exacerbate chronic conditions such as diabetes (Shields, 2002). In view of the findings of this study, integration of patient and family education related to diabetes and shift work should be tailored to meet patient's needs. For instance, patients with diabetes who undertake shift work should be educated and instructed to modify their medication administration time and meal habits to meet their respective work schedules. To address the potential issue of hypoglycemia episodes, patients should be taught to have available food with them.

Finally, evening/night workers need to be assisted with the potential health misalignments caused by shift work. The start point is a comprehensive assessment

regarding a patient's work schedule, and self-reported sleep hygiene habits. This will allow health care practitioners the ability to formulate a personalized plan of care for the patient. Costa (2010) recommends that the person working shift work should be counseled regarding the potential health problems and disorders associated with shift work, and should be instructed about the best coping strategies to minimize them (e.g., improved diet, physical fitness, and increased rest times). In addition, providers should educate evening/night workers with diabetes about helpful sleep hygiene practices. Michael Thorpy (2015) recommends the following good sleep hygiene practices: (1) maintain a regular wake and sleep patterns seven days a week, (2) avoid stimulants such as caffeine, nicotine, and alcohol intake close to bedtime, (3) get regular exercise, (4) avoid heavy meal consumption before bedtime, and (5) avoid light noises associated with listening to the radio or watching television during sleep time.

Based on the findings from the current study, experimental research is recommended to examine the effects of shift work on diabetes self-management activities. Additionally, longitudinal research is recommended to evaluate diabetic evening/night workers' quality of sleep, and its effect on blood glucose levels.

Implementation to Clinical Practice

This study examined the effect of diabetes self-management activities on people who undertake shift work. The results of the study did not show a perceived difference between evening/night workers and daytime workers for self-management activities of Type 2 DM. On the other hand, the study demonstrated that evening/night workers perceived a difference in quality of sleep when compared to their dayshift worker counterparts. Based on these findings, health care providers can utilize this research to

address the quality of sleep issues of diabetic evening/night workers – which if left unaddressed could have negative implications in the diabetic self-management activities of evening/night workers. For example, practitioners should inquire about the work schedule of patients with diabetes, to tailor an individualized plan of care. Practitioners should also educate evening/night workers who have diabetes about good sleep hygiene. The poor quality of sleep of evening/night workers with diabetes has the potential to result in accelerating diabetic complications and other health misalignments, if left unaddressed.

Clinicians can utilize the findings to tailor their patients' plan of care based on the shift that they work. This will influence a patient's ability to actively engage in diabetic self-care activities. Naglekerk, Reich, and Meengs (2006) highlight the importance of barrier and strategy identification in developing and implementing realistic self-management plans. Naglekerk, Reich, and Meengs explain that providers are instrumental in helping patients become aware of their barriers to engage in self-management activities and identify strategies to overcome obstacles in managing a chronic illness. This is also true for the role of provider in helping their patients to improve their quality of sleep.

Study Limitations

This study has a few of limitations that have affected its findings. One limitation is the cross-sectional design that was employed, which provides information for only one point in time. Consequently, data collection at different points in time may have provided more robust data findings. Also, the study sample was small and findings

cannot be generalized. In addition, patients self-reporting of data such as weight, height, waist circumference, and sleep difficulties could have been under or over reported.

Dissemination and Utilization of the Results

Informing others of research findings (e.g., presenting in conferences and publishing papers) is a well-accepted scholarship activity (Magnan, 2010). Magnan goes on to explain that publication of DNP projects serves as a mechanism to advance nursing knowledge. This activity has the potential to positively impact healthcare services and patient care outcomes.

It is the hope that this project's results might have an impact at the clinical practice level. Diabetes is a chronic health condition that must be understood from the medical, psychological, spiritual, and behavioral perspective (Sylvia & Domian, 2012), as well as from the environmental one (e.g., type of work). Strict blood glucose control minimizes diabetes associated complications. However, for some patients reaching optimum blood glucose levels is challenging due to the complexity of diabetes' care. Health providers need to understand patients' barriers affecting their perception about their disease and engagement in ongoing self-care management. Hopefully, the results of this DNP project will expand providers' knowledge regarding the impact that night-shift work has on diabetic patients' self-management activities, which contribute to improving and maintaining their health.

Dissemination Method

The Journal of Nurse Practitioners (JNP) was selected as a means to disseminate this project. The JNP is a peer-reviewed journal dedicated to offering high quality articles useful to nurse practitioners to excel as health care providers in different primary and

acute care settings (The Journal of Nurse Practitioners [JNP], 2015). Furthermore, the JNP is known for supporting and welcoming the submission of DNP projects for publication. In fact, the JNP offers great tips for DNP graduates interested in publishing their DNP project.

Discussion

Diabetes provides healthcare providers with an exceptional opportunity to enhance the lives of patients by offering behavioral modifications, preventive care, and treatments. Healthcare consumers look to their healthcare providers for direction related to different aspects of their medical care. It is under this assumption that clinicians can influence a patient's health outcomes. For instance, in a study that investigated the patient-provider relationship in relation to adherence to treatment in diabetes, Cierchanwshi, Katon, Russo, and Walker (2001) found that patients with dismissing attachment and self-reported perceived poor patient-provider communication had poorer blood glucose control. Conversely, Cierchawshi et al point to previous studies showing that patients who are satisfied with the patient-provider relationship are more compliant with their diabetes care.

The first question of this study did not show a significant difference between daytime workers and evening/night workers for self-management activities of Type 2 DM related to glucose management, physical activity, and health-care use. The dietary control variance showed trending toward significant difference. These findings may have been influenced by patients' self-reported perception that can be different from objective observations. For instance, the results from the Cross-National Diabetes Attitudes, Wishes, and Needs (DAWN) study found that patients reported higher adherence rates

compared to the observed ones for compliance with medication regimen, self-monitoring of blood glucose, and routine follow-ups with their healthcare providers (Peyrot et al., 2005).

In many industrialized societies, shift work has become a standard practice. The second question of this study found a significant difference between daytime workers and evening/night workers in perception of quality of sleep. This finding confirms previous similar studies' results of significant differences of self-reported poor sleep quality in evening/night workers compared to daytime workers (Mohammadi, Ahmad El Sagnier, & Ramadan, 2014). A recent study in Iran also shows similar results (Yazdi, Sadeghniaat-Haghighi, Loukzadeh, Elmizadeh, & Abbazi, 2014). Diabetic evening/night workers' self-reported quality of sleep is affected by multiple factors. Evening/night workers have to change their bedtimes frequently – which produces circadian rhythms maladjustments (Niu et al., 2013). In addition, bright light and noise are reported factors affecting evening/night workers' daytime sleep – which results in sleep deprivation and awake-time sleepiness (Guo, et al., 2013). The finding of the perceived poor quality of sleep problem requires special attention because of the potential negative impact that it has on the patient's ability to engage in self-management activities – which are essential to minimize in order to achieve optimum blood glucose control.

Summary

Diabetes mellitus is a complex health condition which requires significant patient self-care activities in order to avert any long term complications. Despite the well-documented benefits of diabetes self-management activities, a large number of patients with diabetes find it difficult to fully adhere to self-care activities. Several factors

contribute and hinder patient compliance with self-care activities including shift work employment. This study did not find a difference in perception between daytime workers and evening/night workers for diabetes self-management activities. Nevertheless, the present study found a significant difference between daytime workers and evening/night workers regarding their quality of sleep. This is an important finding because it supports the current body of knowledge regarding the potential health misalignments cause by shift work. Thus, practitioners should be concerned about how shift work affects night evening/night workers' self-care activities aim to ameliorate diabetes related complications.

APPENDIX A

DETAILED TIMELINE

April 2014	<ul style="list-style-type: none"> • Project proposal defense • Revision to proposal 	<ul style="list-style-type: none"> • Project presented to DNP project committee on 4/17/2014
August-December 2014	<ul style="list-style-type: none"> • After obtaining permission to proceed with the DNP project from the DNP project committee, student will initiate IRB approval. 	<ul style="list-style-type: none"> • DNP student applied for IRB from the University of Nevada, Las Vegas. IRB approval obtained on April 08, 2015.
April-May 2015	<ul style="list-style-type: none"> • Data will be collected • Analyze the data to answer the project questions 	<ul style="list-style-type: none"> • Data collection was completed on April 27, 2015. Data analysis was completed May 02, 2015
May 2015	<ul style="list-style-type: none"> • Develop project evaluation and recommendations • Identify interventions to clinical practice • Write the remaining parts of DNP project 	<ul style="list-style-type: none"> • Project evaluation and recommendations done on May 08, 2015 • Identified interventions implementation by May 08, 2015 • Final DNP project to DNP committee for review by May 08, 2015
March 2015-May 2015	<ul style="list-style-type: none"> • Make revisions to DNP project • Prepare for to defend DNP project • Present project findings & recommendations to clinical site 	<ul style="list-style-type: none"> • Any needed revisions will be completed by May 08, 2015 • Present DNP project by May 08, 2015
May 2015	<ul style="list-style-type: none"> • Submitted final paper to the Graduate College 	

APPENDIX B

COPY OF DSMQ INSTRUMENT

Diabetes Self-Management Questionnaire (DSMQ)

The following statements describe self-care activities related to your diabetes. Thinking about your self-care over the last 8 weeks , please specify the extent to which each statement applies to you.	applies to me very much	applies to me to a considerable degree	applies to me to some degree	does not apply to me
1. I check my blood sugar levels with care and attention. <input type="checkbox"/> <i>Blood sugar measurement is not required as a part of my treatment.</i>	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
2. The food I choose to eat makes it easy to achieve optimal blood sugar levels.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
3. I keep all doctors' appointments recommended for my diabetes treatment.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
4. I take my diabetes medication (e. g. insulin, tablets) as prescribed. <input type="checkbox"/> <i>Diabetes medication / insulin is not required as a part of my treatment.</i>	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
5. Occasionally I eat lots of sweets or other foods rich in carbohydrates.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
6. I record my blood sugar levels regularly (or analyse the value chart with my blood glucose meter). <input type="checkbox"/> <i>Blood sugar measurement is not required as a part of my treatment.</i>	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
7. I tend to avoid diabetes-related doctors' appointments.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
8. I do regular physical activity to achieve optimal blood sugar levels.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
9. I strictly follow the dietary recommendations given by my doctor or diabetes specialist.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
10. I do not check my blood sugar levels frequently enough as would be required for achieving good blood glucose control. <input type="checkbox"/> <i>Blood sugar measurement is not required as a part of my treatment.</i>	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
11. I avoid physical activity, although it would improve my diabetes.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
12. I tend to forget to take or skip my diabetes medication (e. g. insulin, tablets). <input type="checkbox"/> <i>Diabetes medication / insulin is not required as a part of my treatment.</i>	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
13. Sometimes I have real 'food binges' (not triggered by hypoglycaemia).	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
14. Regarding my diabetes care, I should see my medical practitioner(s) more often.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
15. I tend to skip planned physical activity.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
16. My diabetes self-care is poor.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0

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APPENDIX C

COPY OF DEMOGRAPHIC/SUPPLEMENTAL QUESTIONNAIRE

BY COMPLETING THIS QUESTIONNAIRE YOU ARE GIVING CONSENT TO PARTICIPATE IN THE STUDY.

Thank you.

Code #: _____

Date: _____

1. Please indicate your age: _____

2. Please indicate your sex: _____ Male _____ Female

3. Which ethnic group below do you most closely identify yourself with?

_____ African American or Black non-Hispanic

_____ Asian

_____ Hispanic

_____ White

_____ Other: Please specify: _____

4. Employment:

Do you work day shift? Yes: _____ No: _____

Do you work schedule(s) other than the traditional day shift (8 a.m. to 5 p.m. shift): Yes: _____ No: _____

Number of years in current job: _____

Number of years working shift work other than the normal 8 a.m. to 5 p.m. shift: _____

On an average day, how many hours do you work?: _____

How many days in a row do you work before you get a day off?: _____

Does your employer allow you to take a short nap during your shift? Yes: _____ No: _____

What type of work do you do (i.e., security, casino worker, firefighter, nurse, etc.)?

5. Education Level:

Some high school: _____ Completed high school: _____ Completed some college: _____

Have an associate's degree: _____ Have a bachelor's degree: _____

Have a master's degree: _____ Have a doctorate degree: _____ Other: _____

6. What is your marital status:

_____ Single

_____ Married

_____ Divorced

_____ Widowed

_____ Living with a partner/ companion

7. Type of diabetes: _____ Type 1 or _____ Type 2

8. Number of years living with diabetes: _____

9. Weight: _____

10. Height: _____

11. BMI: _____

12. Waist circumference: _____

13. How many medications are you currently taking? _____

14. Are you currently taking diabetic medications? Yes: _____ No: _____

15. How many diabetic medications are injectable? _____
16. How many hours do you sleep every day? _____
17. Do you have trouble sleeping during the day time: Yes _____ No _____
18. Do you have difficulty falling asleep: Yes _____ No _____
19. Do you have difficulty staying asleep: Yes _____ No _____
20. Are you tired or sleepy during awake hours: Yes _____ No _____
21. Sometimes individuals feel they are in better control of their life if they engage in spiritual activities (i.e., spending time in the mountains, spending time in or by the ocean, going to church, meditating, etc.). Do you engage in any activity that you call a spiritual experience? Yes: _____
No: _____
22. If you engage in any activity that you call a spiritual experience, does your involvement provide you with a greater sense of managing your diabetes? Yes: _____ No: _____
23. Do you have someone to help you manage your diabetes? (i.e., family member or friend) Yes: _____
No: _____
24. If yes, please indicate those who support you to manage your diabetes:
(please specify who this person is; for example: a family member, a friend, or others).
Family member(s): _____ Friend(s): _____ Support group: _____ Other (s): _____
25. Do you feel close to your family? Yes: _____ No: _____
26. Are you satisfied with your family support? Yes: _____ No: _____
27. Do you feel close to your friends? Yes: _____ No: _____
28. Are you satisfied with your friends support? Yes: _____ No: _____
29. Do you feel you receive greater support/help with your diabetes from others (NOT a family member or a friend)? Yes: _____ No: _____
30. Do you feel that since you started doing shift work (working hours other than 8 a.m. to 5 p.m.) you started to experience (select all that apply):
- leg pain
 - wounds difficult to heal
 - fungal infection
 - numbness in feet or legs
 - dizziness
 - vision changes
 - other: _____
(please specify)
 - Not applicable

APPENDIX D

LETTER OF SUPPORT FROM NEM MEDICAL CENTER

NEM MEDICAL CENTER

4440 E. Washington Avenue, Suite # 109

Las Vegas, Nevada 89110

March 9, 2015

Office of Research Integrity – Human Subjects
University of Nevada Las Vegas
4505 Maryland Parkway Box 451047
Las Vegas, NV 89154-1047

Subject: Letter of Authorization to Conduct Research at NEM Medical Center.

Dear Office of Research Integrity – Human Subjects:

This letter will serve as authorization for the University of Nevada, Las Vegas (“UNLV”) researcher/research team, Dr. Patricia Alpert to conduct the research project entitled The Impact of Night Shift on Diabetes Self-Management Activities at NEM Medical Center (“the Facility”) located at 4440 East Washington Avenue, # 109, Las Vegas, NV, 89110.

The Facility acknowledges that it has reviewed the protocol presented by the researcher, as well as the associated risks to the Facility. The Facility accepts the protocol and the associated risks to the Facility, and authorizes the research project to proceed. The research project may be implemented at the Facility upon approval from the UNLV Institutional Review Board.

If we have any concerns or require additional information, we will contact the researcher and/or the UNLV Office of Research Integrity – Human Subjects.

Sincerely,



Facility's Authorized Signatory



Printed Name and Title of Authorized Signatory

3-11-2015
Date



**UNLV Biomedical IRB - Exempt Review
Exempt Notice**

DATE: April 8, 2015

TO: Patricia Alpert, PhD
FROM: Office of Research Integrity - Human Subjects

PROTOCOL TITLE: [724265-1] The Impact of Night Shift Work on Diabetes Self-Management Activities

ACTION: DETERMINATION OF EXEMPT STATUS
EXEMPT DATE: April 8, 2015
REVIEW CATEGORY: Exemption category # 2

Thank you for your submission of New Project materials for this protocol. This memorandum is notification that the protocol referenced above has been reviewed as indicated in Federal regulatory statutes 45CFR46.101(b) and deemed exempt.

We will retain a copy of this correspondence with our records.

PLEASE NOTE:

Upon final determination of exempt status, the research team is responsible for conducting the research as stated in the exempt application reviewed by the ORI - HS and/or the IRB which shall include using the most recently submitted Informed Consent/Assent Forms (Information Sheet) and recruitment materials. The official versions of these forms are indicated by footer which contains the date exempted.

Any changes to the application may cause this protocol to require a different level of IRB review. Should any changes need to be made, please submit a **Modification Form**. When the above-referenced protocol has been completed, please submit a **Continuing Review/Progress Completion report** to notify ORI - HS of its closure.

If you have questions, please contact the Office of Research Integrity - Human Subjects at IRB@unlv.edu or call 702-895-2794. Please include your protocol title and IRBNet ID in all correspondence.

Office of Research Integrity - Human Subjects
4505 Maryland Parkway . Box 451047 . Las Vegas, Nevada 89154-1047
(702) 895-2794 . FAX: (702) 895-0805 . IRB@unlv.edu

APPENDIX F



EXEMPT RESEARCH STUDY

INFORMATION SHEET

Department of School of Nursing

TITLE OF STUDY: The Impact of Shift Work on Diabetes Self-Management Activities

INVESTIGATOR(S) AND CONTACT PHONE NUMBER: Dr. Patricia Alpert, DrPH, Principal Investigator and Faculty Project Chair (e-mail address: patricia.alpert@unlv.edu or 702-895-3810). Daniel Navarro, DNP student (e-mail address: navarr46@unlv.edu or 702-895-3810).

The purpose of this study is to examine the impact that shift work has on diabetes self-management activities in order for health care providers to customize treatment plans designed to promote adherence to healthy life habits and diabetes self-management activities that minimize diabetes related complications.

You are being asked to participate in the study because you meet the following criteria: (1) you are 21 years of age or older, (2) have been diagnosed with type 2 diabetes, (3) are able to read English at approximately the 5th grade level, (4) are willing to participate in the study, and (5) work full time.

If you volunteer to participate in this study, you will be asked to do the following: (1) complete the diabetes self-management activity questionnaire and (2) complete a demographic/ supplemental questionnaire.

This study includes only minimal risks. The study will take 20-30 *minutes* of your time. You *will not* be compensated for your time.

For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted you may contact **the UNLV Office of Research Integrity – Human Subjects at 702-895-2794, toll free at 877-895-2794, or via email at IRB@unlv.edu.**

Your participation in this study is voluntary. You may withdraw at any time. You are encouraged to ask questions about this study at the beginning or any time during the research study.

Participant Consent:

I have read the above information and agree to participate in this study. I am at least 18 years of age. A copy of this form has been given to me.

APPENDIX G

APPROVAL TO USE DSMQ INSTRUMENT

University of Nevada, Las Vegas Mail - FW: AW: DSMQ

Page 1 of 2



Daniel Navarro <navarr46@unlv.nevada.edu>

FW: AW: DSMQ

1 message

DJ NNN <hrrn2000@msn.com>
To: "navarr46@unlv.nevada.edu" <navarr46@unlv.nevada.edu>

Wed, Feb 4, 2015 at 10:41 AM

Subject: AW: DSMQ
Date: Wed, 26 Feb 2014 09:15:37 +0100
From: schmitt@diabetes-zentrum.de
To: hrrn2000@msn.com

Dear Mr. Navarro,

thank you for your interest and kind request to use the DSMQ. You may naturally use the questionnaire as a measurement instrument of diabetes self-management.

May I ask what exactly will be the theme of your work?

Please find attached the questionnaire and some additional files that may serve your work.

Kind regards from Germany,

Andreas Schmitt

Andreas Schmitt, MPsych, Scientific Associate

German Diabetes Center Mergentheim

Research Institute of the Diabetes Academy Mergentheim (FIDAM)

Theodor-Klotzbücher-Str. 12

97980 Bad Mergentheim

Germany

<https://mail.google.com/mail/u/0/?ui=2&ik=1826f0326a&view=pt&search=inbox&th=14b5...> 2/4/2015

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