

WELLNESS PROGRAM FOR STAFF SHIFT WORKERS ON A 24/7 INPATIENT UNIT

A DOCTOR OF NURSING PRACTICE PROJECT SUBMITTED TO THE OFFICE OF
GRADUATE EDUCATION OF THE UNIVERSITY OF HAWAII AT MĀNOA IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF NURSING PRACTICE

MAY 2019

By

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Keywords: shift work, workplace wellness program, work exercise program, night shift
employee weight loss

Abstract

The purpose of this Doctor of Nursing Practice project was to implement an evidence-based staff focused exercise and wellness program among healthcare staff working at the Veterans Affairs inpatient unit. Nearly 15 million Americans work full time on evening shift, night shift, rotating shifts, or other employer arranged irregular schedules. This deviated work schedule affects the body's natural circadian rhythm and can lead to inadequate sleep. Over time, chronic short sleep has been linked to an increased risk of heart disease, obesity, hypertension, and lower motor/cognition function. The data collection method includes pre-evaluation BMI measurements, a 10-week 10,000 steps a day exercise program, and post-evaluation BMI measurements. Pre-evaluation BMI among 11 staff members were obtained with an average measurement of 30.74. At the end of 10 weeks, all staff members had a decrease in weight ranging from 1 pound to 14.7 pounds. The average post BMI was 29.83.

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Introduction

In 2004, the Bureau of Labor Statistics reported that nearly 15 million Americans work full time on evening shift, night shift, rotating shifts, or other employer arranged irregular schedules (CDC, 2017). Shift work, which is defined as a work schedule deviated from the normal 0900 to 1700 time frame has been shown to affect the body's natural circadian rhythm, which in turn affects sleep quality (Cuesta, Boudreau, Dubeau-Laramee, Cermakian, & Boivin, 2016). Inadequate sleep, along with chronic short sleep, has been linked to an increased risk of heart disease, obesity, hypertension, and lower motor/cognition function (Healthy People 2020, 2014).

In an American and European survey, 15% to 30% of adult workers have been associated with shift work (Boivin & Boudreau, 2014). In a Canadian survey, 34% of shift workers have reported problems with the onset of sleep as well as maintaining their sleep compared to 25% of daytime workers; similar results were also reported in a study conducted in Japan (Boivin & Boudreau, 2014; Itani et al., 2011). A 2010 US National Health Survey reported that sleeping less than 6 hours per day increased individuals' risk of accidents by 86% due to sleep deprivation (Lombardi, Kaneita, Murata, Yokoyama, & Ohida, 2012). There was a 31% to 53% increase in absenteeism and a 48% to 92% increase in compensations for absenteeism (D'errico & Costa, 2012).

Problem

The Veterans Affairs (VA) inpatient unit, employs approximately 17 healthcare shift workers and 13 of them are either overweight or obese. Many shift workers have reported a weight gain on average of about 12 pounds from their date of hire (personal communication, July 8 & 9, 2018). Many have complained of the mandated overtime, typically incurred on a weekly

basis due to short staffing, which further disrupts shift workers' circadian rhythm and sleep, eat, and exercise patterns. Based on this high percentage of increased BMI, this project is considered a high priority for the organization since activities that enhance veterans and/or staff whole health is a priority of the Director of the VA Pacific Islands Health Care System (VAPIHCS).

Review of Literature

An electronic search was conducted using the PubMed database. Search terms included “obesity,” “shift work,” “night shift workers,” “healthcare workers,” “sleep disorder,” and “weight gain”. The MeSH database, MeSH terms “work schedule tolerance,” “dyssomnias,” “sick leave,” and “absenteeism” were also used as part of the search. The inclusion criteria included a publication date within the last ten years, academic journals that contained one of the following: poor work performance, physical/mental effects related to sleep deprivation, financial cost of sick leaves, and sleep hygiene. Published literature that did not address shift work and sleep deprivation was excluded. The search retrieved a total of 98 articles; 14 publications from 2007 to 2017 were reviewed that fit the scope of the inclusion and exclusion criteria. Other database such as CINAHL and PsycINFO were not used.

Critiquing the Evidence

Mosby's Quality of Evidence was utilized to grade the level of evidence (LOE). Each study was critiqued, and then assigned to one of eight levels (see Appendix A). The breakdown of each article based on their LOE are as follow: one article listed as LOE II; one article listed as LOE III; three articles listed as LOE IV; two articles listed as LOE V; three articles listed as LOE VI; three articles were literature reviews, and one clinical practice guideline (CPG). A summary of the articles LOE can be seen in Appendix B. The critiquing tools used were Mosby's Research Critique Form (2004), and for the evaluation of the CPG, the Appraisal of Guidelines for

Research and Evaluation (AGREE) II instrument was utilized (Brouwers et al. (2010). The AGREE II provides a 23-item tool separated into six domains to evaluate the quality of each CPG based on a one to seven grading system. The maximum number of points a CPG can achieve is 161 (7 maximum score multiplied by 23 items).

In November 2013, the American Heart Association (AHA), American College of Cardiology (ACC), and The Obesity Society (TOS) published the “2013 AHA/ACC/TOS Guideline for the Management of Overweight and Obesity in Adults: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and The Obesity Society.” Using the Appraisal of Guidelines for Research and Evaluation (AGREE) II tool, this CPG scored 145 points which is a CPG rating of 90%.

Consequences of Sleep Deprivation

Working the night shift affects circadian rhythm, quality of sleep, increased risk of heart disease, obesity, hypertension, and lowers cognitive functions (Boivin & Boudreau, 2014; Broussard & Cauter, 2016; Cuesta et al., 2016; Lombardi et al., 2012). The quality and duration of sleep plays an important role in basic human functions (Boivin & Boudreau, 2014; Cuesta et al., 2016). Working consecutive long shifts and night shifts can lead to sleep deprivation, burnout, and ultimately job dissatisfaction (Karagozoglou & Bingol, 2008; Stimpfel, Sloane, & Aiken, 2012).

Weight Concerns

There is a considerable amount of literature reporting the association of night shift, poor sleep, and weight gain (Boivin & Boudreau, 2014; Broussard & Cauter, 2016; Cuesta et al., 2016; Itani et al., 2011; Karagozoglou & Bingol, 2008; Smith, Fritschi, Reid, & Mustard, 2013; Stimpfel et al., 2012; Wong, Wong, Wong, & Lee, 2010). A variety of factors such as poor sleep,

overcompensated caloric intake, and lack of exercise related to the onset of weight gain, can be linked to shift work. The increase in weight will also increase the BMI. Literature recommends utilizing evidence-based practice interventions to improve the health of those affected by night shift (Broussard & Cauter, 2017; Fujishiro, Hibert, Schernhammer, & Rich-Edwards, 2017; Zhao, Bogossian, & Turner, 2012).

Application to DNP Project

A multi-modal approach has been suggested as the best approach to weight loss management (Jensen et al., 2013). The first steps include assessing the BMI and overall risk. A focus on exercise is recommended. In addition, exercise methods that involve caloric deficits such as moderate and vigorous exercises in a progressive timely manner have been shown to be effective (Eaton et al., 2016). To increase the effectiveness of this project, the use of motivational interviewing is supported by the literature. According to Edwards, Stapleton, Williams, and Ball (2014), motivational interviewing has shown a positive impact on the success of improving an individual's health.

Conceptual Framework

The Iowa Model was established in 1994 to guide nurses and other health care providers to utilize research-based practice to promote quality healthcare and improve patient outcomes (Titler et al., 2001). Since then, social and economic determinants have shaped the revision of the IOWA Model from Research-Based Practice to Evidence-Based Practice (EBP). This model incorporates the five steps of the EBP process - assess practice, decide, plan, intervene, and evaluate (Titler et al., 2001). See Appendix C for a graphic of the model. The IOWA model is relevant to this Doctor of Nursing Practice (DNP) project because it provides guidance, via steps, to proceed with this project: identifying triggers (Problem and/or Knowledge focused),

establishing the priority of the topic, forming a team, assembling relevant research, critiquing the evidence, piloting the change in practice, implementing EBP, evaluating, and disseminating results.

PICO, Purpose Statement, and Goals

PICO Question

The review of the literature guided the development of the PICO question. The PICO question is: Would implementing a staff focused exercise and wellness program among healthcare staff shift workers at the VA inpatient unit decrease their BMI?

Purpose Statement

The Purpose of this project is to determine if a staff focused participatory exercise and wellness program impacted the BMI of staff members scheduled for shift work who are at a high risk for developing obesity. This purpose was selected because of circadian rhythm disruption, poor sleep hygiene, stress eating, and sub-normal levels of physical activity.

Aim and Goals

The long term aim of this evidence-based practice project is to potentially decrease the risk of developing adverse health effects associated with shift work. By promoting a participatory exercise and wellness program among the healthcare staff shift workers, the goal is to decrease their current BMI by 1% or more over a 10 week participatory exercise period.

Methods/Procedures

Project Design

This DNP project utilized an EBP approach following the design of the IOWA model. The project design involved a 10-week participatory exercise program with pre- and post-evaluations. The 10-week participatory exercise program is intended for the staff member to

achieve at least 10,000 steps per day. Prior to the program, a pre-evaluation measured the staff member's current height and weight. After the program, staff completed a post evaluation consisting of the same measures in order to evaluate the program succession (see Appendix D). The project director is a staff RN on this VA inpatient unit.

Human Subject Consideration

This project did not require an IRB application for approval, however it underwent the mandatory VA EBP Council review and approval process. Measurements and data collection were kept confidential. All other information was kept in private. This project offered possible health benefits without any risk to the staff member.

Participants

Healthcare staff from the VA inpatient unit were invited to participate in this program. Inclusion criteria consisted of full time employment status, work on evening, night, or rotating shifts, 18-week commitment, not currently pregnant, and self-report of not having health problems that prevent the staff member from walking. This project was done in collaboration with the unit's nurse manager to allow incorporation of reasonable reward incentives for participation, such as healthy snacks or a letter for the employee's personal file. Each staff member was able to keep the pedometer they used in the participatory exercise program.

Data Collection Procedure

The start date for the implementation part of this project was mid-August 2018. The recruitment process occurred the following 2 weeks.

In the first two weeks of September, a one-hour individual interview by the project director with each staff member occurred. During the interview process, an informational session about the program occurred, height and weight data were collected and educational in-services

about the adverse health effects of shift work and proper ways to combat it was provided. The topics of the in-services are listed in Appendix E. The interview was done either before or after their shift in a private room without the presence of other staff members.

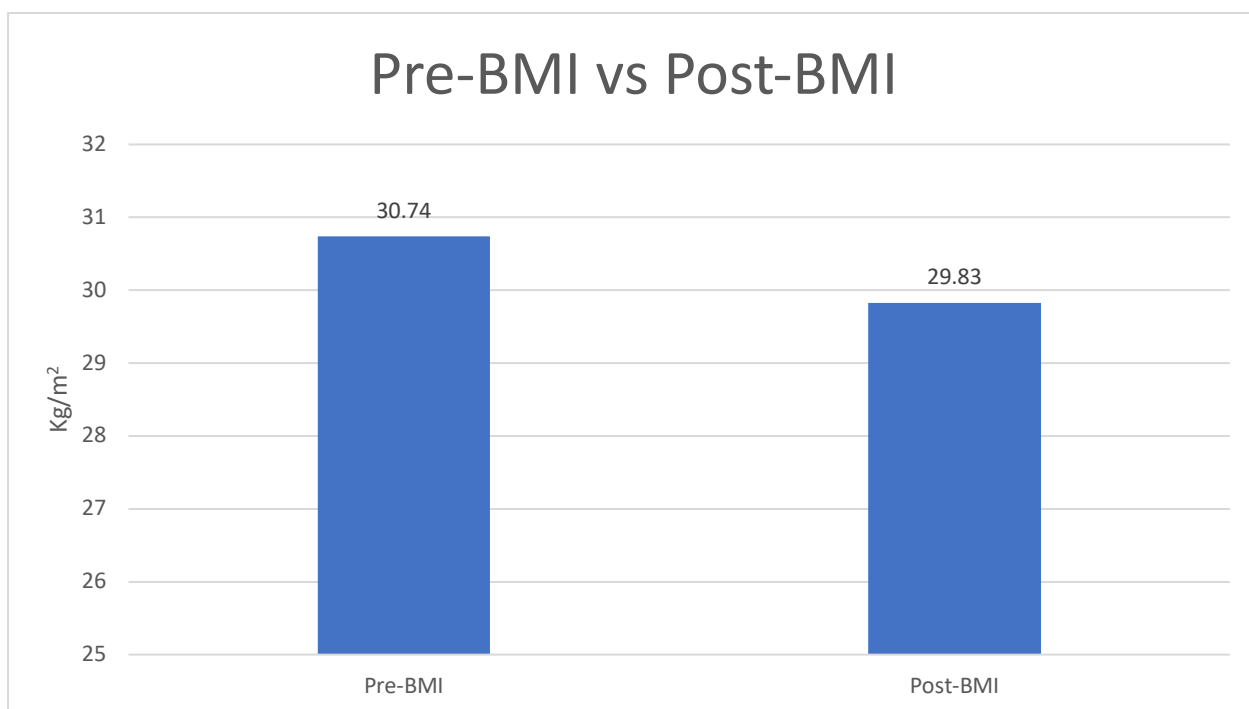
On the third week of September, the 10-week participatory exercise program began. Every Sunday and Wednesday, 15-minute individual check ins with the Project Director were held. The check-ins consisted of motivational interviewing and verification of the staff member's progression status, which included how many days of the week they reached 10,000 steps.

The 10-week participatory exercise program ended at the end of November 2018. A decision was made to avoid the Holidays because of the various Holiday feasts adding to excessive caloric intake, which can obscure the final weight changes. The subsequent weeks in December consisted of data analysis and an award ceremony. A Gantt chart provides a visual overview of the project timeline (see Appendix F).

Data were logged using a generic data spreadsheet (see Appendix G). The spreadsheet consisted of a code given to a staff member, initial weight, initial height, initial BMI, weekly pedometer recordings, bi-weekly weight, and ending height, weight, and BMI. The data were kept safely locked and unavailable to everyone except the project director. At the end of the project, all the raw data were destroyed.

Results

Eleven Staff members agreed to participate in the project. All agreed to engage in the 10-week activity and participate in achieving 10,000 steps a day. There was a wide range of weight loss. The median weight loss was 4 to 5 pounds. All staff members had a decrease in weight. The average pre-intervention BMI was 30.74 among 11 staff members and the average post BMI was 29.83 (see graph).



During the initial 1-hour interview, all staff members reported poor eating habits, inadequate sleep, and lower levels of physical activity. In addition, many expressed concerns with weight gain since the start of employment, which is reflected in their BMI.

During the 10-week participatory program and weekly 15-minute check-ins, the staff members predominantly focused on achieving the 10,000 steps per day. Staff verbalized motivation to reach their daily 10,000 steps a day. Some staff went as far to report dissatisfaction if they did not reach their goal, which resulted in them leaving their house to walk around the neighborhood until their goal was met. However, while staff were cognizant of steps needed to achieve healthy eating and better sleep hygiene, they were not as focused in these other goals as they were with the steps.

There was a 2.96% difference in the BMI Post-intervention from the pre-BMI. As a group, the staff members that participated in the project reached the outcome of this project of a decrease of 1% in BMI, demonstrating that the group met the goal of achieving the steps.

Discussion

Many staff members expressed eagerness to start a workplace wellness program because they were aware of their weight gain since the start of employment. Factors such as a lack of motivation, time constraints, and poor sleeping habits made it hard for them to focus on a weight loss program. They verbalized struggles with dietary changes and adapting a better sleep hygiene due to convenience. Fast food and snacking made it easier for them to have a quick bite during odd hours. Furthermore, going to bed after completing errands at the end of their shift work added to their poor sleeping pattern. It was important for the project leader to individualize the motivational feedback based on their individual preferences. Some suggested that keeping a dietary and sleep log to help track their pattern can provide a visual to see where change can happen.

It was easy for staff to approach the program director when achievements were made such as reaching more than 10,000 steps a day. There was also a friendly competition on the unit to see who would do the most steps during the shift. This led to team building with hikes after work, going to the gym as a group, and encouraging each other to reach their step goals. Some reported an increase in moral on the unit as well. All staff members verbalized satisfaction with their results and would like to continue a workplace wellness program.

Sustainment

The success of this project and its results will be presented to leaders of the unit and the unit practice counsel. The recommendation to the unit practice council will be to continue education on weekly health related topics to further enhance the staff's wellness focus.

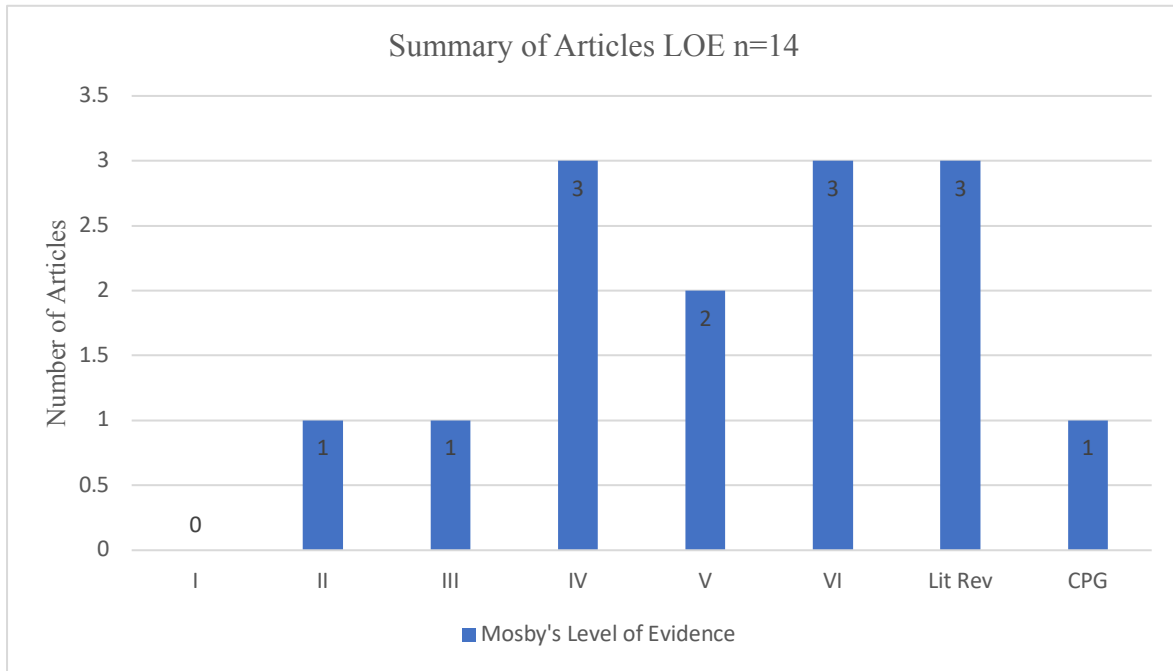
Appendix A

Level of Evidence

Level I	All relevant randomized controlled trials (RCTs)
Level II	At least one well-designed RCT
Level III	Well-designed controlled trials without randomization
Level IV	Well-designed case-controlled or cohort studies
Level V	Descriptive or qualitative studies
Level VI	Single descriptive or qualitative study
Level VII	Authority opinion or expert committee reports
Other	CPG and review of literature

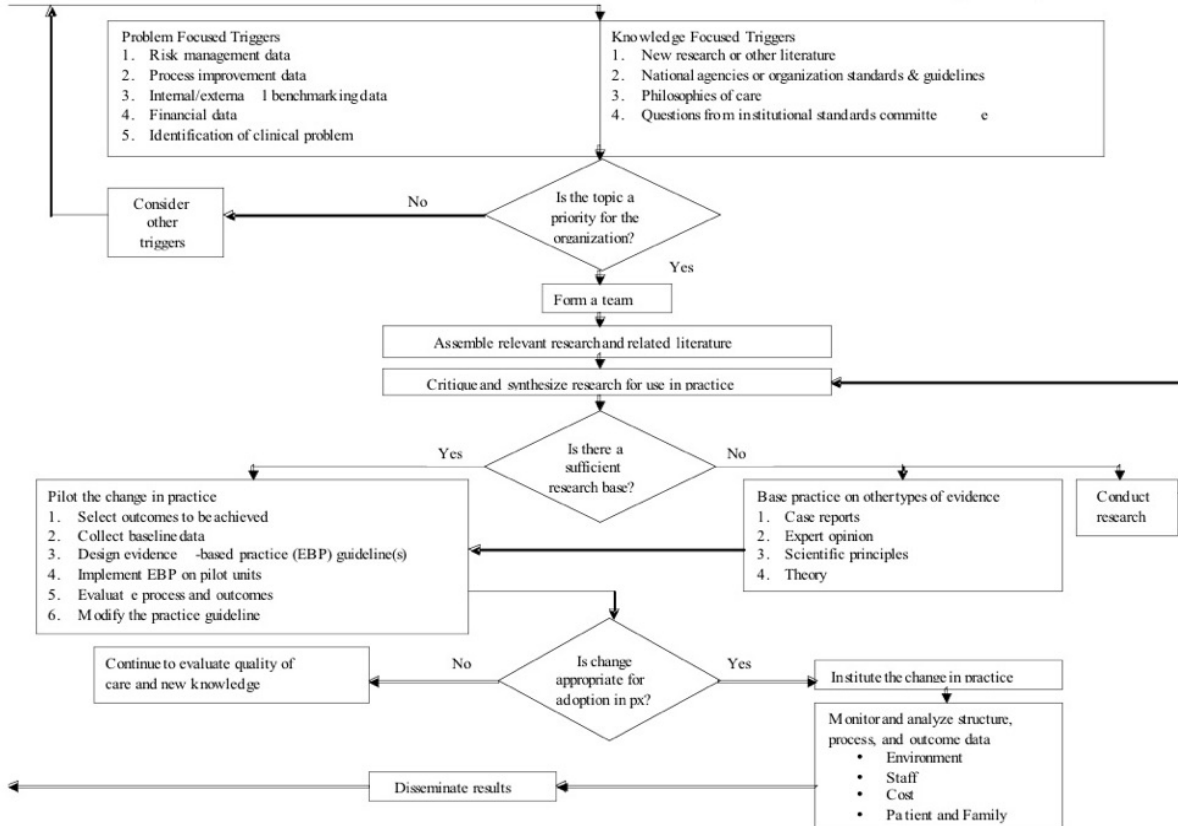
Mosby's Level of Evidence (Melynck, 2004).

Appendix B



Appendix C

Iowa Model of Evidence-Based Practice to Promote Quality Care



IOWA Model (Titler et al., 2001).

Appendix D

Program: Cody Hua Logic Model
 Situation: Pedometer wellness program for 3B2 Healthcare staff shift workers

Inputs	Outputs		Outcomes – Impact			Evaluation Questions
	Activities	Participation	Short	Medium	Long	
<ul style="list-style-type: none"> • 3B2 healthcare Staff • Wellness program protocol • Nurse Scientist • NP Student • Weight Scale • Measuring Tape • Computer • Calculator • Pedometer • Congratulations Award Certificate • Healthy Snacks 	<ul style="list-style-type: none"> • Meeting with content expert, project chair, and third committee member • Develop Wellness Program educational materials/incentives • Schedule and conduct wellness education sessions for healthcare staff • Pre-data: Height/Weight, medical hx, sleeping habits, activity level, eating habits • Informational session regarding wellness program • Award ceremony for those who completed wellness program • Completion certificate • Weekly motivational texts messages • Post-data: Height/Weight, medical hx, sleeping habits, activity level, eating habits 	<ul style="list-style-type: none"> • 3B2 Healthcare staff shift workers • VA Pacific Islands Healthcare System 	<ul style="list-style-type: none"> • Identify the problem-based trigger • Establish a team • Complete a needs assessment • Introduce the components of the wellness program 	<ul style="list-style-type: none"> • Participants understand the importance of physical activity, healthy dietary intake, and proper sleep hygiene • Post eval improvement: Reminds oneself to eat healthy, exercise regularly, and sleep better, Improved sleep quality, Develop an interest in health • Improved body composition 	<ul style="list-style-type: none"> • Continue to maintain healthy living • Decrease BMI • Improve work productivity • Decrease work sleepiness • Other department adapts shift work wellness program • Other hospitals adapting wellness programs • New shift workers hires understand risk and solutions to combat shift work risks • Reduction in absenteeism 	<p>Does the staff at 3B2 unit recognize that a problem exist, and an intervention is needed?</p> <p>How much baseline knowledge do the participants and staff have regarding healthy eating, exercising, and proper sleep?</p> <p>How much did they learn from the information sessions?</p> <p>Can they identify proper sleep techniques, healthier food choices, and basic exercises?</p> <p>How are the participants being motivated?</p> <p>Are the participants losing weight, having better sleep, improve in work productivity, decrease in sleepiness, and decrease in work absenteeism?</p>

Appendix E

Topics for educational in-services

Purpose: To provide educational in-services about the adverse health effects of shift work and proper ways to combat them.

1. Adverse health effects of shift work
 - a. Disrupt body's natural circadian rhythm, which in turn affects sleep quality.

Inadequate sleep, along with chronic short sleep, have been linked to an increased risk of heart disease, obesity, hypertension, and lower motor/cognition function
2. Proper sleep hygiene
 - a. Aim for 7 to 8 hours of sleep
 - b. Sleep log
 - c.

Steps	Practical Advice
Ensure the room is dark if sleep is required during the daytime.	Ensure the room has sufficiently Install black-out blinds in all windows
Ensure a constant temperature in bedroom	Aim for temperature around 68° F Avoid too many bed clothes
Reduce noise exposure before and during the required sleep period.	Avoid watching TV or listening to loud music before sleeping
	Use a room at the rear of the house if near a busy road

	Consider earplugs if the ambient noise is intrusive
	Put telephones on an answering machine
	Ask family members to be quiet
Avoid large meals, caffeine containing drinks, smoking, and alcohol before the required sleep period	Schedule mealtime so that the main meal of the day is during or before the work period.
	Consider having a warm, milk drink before the required sleep period

Thorpy, M. J. (2010). Managing the patient with shift-work disorder. *The Journal of Family Practice, 59*(1), S24-S31.

3. Attainable healthy eating and nutrition
 - a. Using myhealthyplate to guide adapting a healthy eating style
 - i. Focus on variety, amount, and nutrition
 - ii. Choose a style low in saturated fat, sodium, and added sugar
 - iii. Start with small changes to build healthier eating style
 - iv. Support healthy eating with everyone
4. Appropriate daily physical activity
 - a. At least 30 minutes of physical activity a day
 - b. Choose activities that are enjoyable

Appendix F

Project Name:	Wellness Program for 3B2 Shift Workers		
Main Investigator:	Cody Hua		
Start Date:	Monday, August 13, 2018		
End Date:	Monday, December 10, 2018		
Total Weeks:	18		
Aims	Task	Completed Week	
	1.1 Recruitment	Week 1	13-Aug-18
	1.2 Recruitment	Week 2	
	1.3 Recruitment	Week 3	
	2.1 Interview	Week 4	
	2.2 Interview	Week 5	
	2.3 Wellness Program	Week 6	
	2.4 Wellness Program	Week 7	
	3.1 Wellness Program	Week 8	
	3.2 Wellness Program	Week 9	
	3.3 Wellness Program	Week 10	
	3.4 Wellness Program	Week 11	
	3.5 Wellness Program	Week 12	
	3.6 Wellness Program	Week 13	
	3.7 Wellness Program	Week 14	
	3.8 Wellness Program	Week 15	
	4.1 Data Analysis	Week 16	
	5.1 Awards Ceremony	Week 17	
	5.2 Follow up	Week 18	10-Dec-18

Appendix G

Individual Data Sheet			
Code Name	Initial Height (cm)	Initial Weight (kg)	Initial BMI
	Weight	Weekly Total Steps	
Week 1			
Week 2			
Week 3			
Week 4			
Week 5			
Week 6			
Week 7			
Week 8			
Week 9			
Week 10			
	Ending Height	Ending Weight	Ending BMI

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