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Increasing Healthy Lifestyle Behaviors in Cargo Drivers

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Abilene Christian University

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by

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Dedication

I dedicate this work to my sons, Jaron Anthony & Darek Alan. You are the two reasons that I will never give up. Cassandra Self-Houston, Lesley Kibel, Griffin Keller, Nelly Gonzalez, and Tracy Zombar: Your support has been so very important to me.

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I give thanks to an all-knowing and strength-giving God that helps me overcome the challenges in my life. This project would not have been possible without Committee Chair Dr. Hebert, ACU Nursing Committee Members, Dr. McGee, and the support of my work family.

Abstract

The purpose of this project was to examine the extent to which lifestyle behaviors of transportation drivers in North Texas can be improved with health education. This research study was conducted to examine the health behaviors of transportation drivers as a result of an educational partnership between nursing and the transportation industry. The goal was to improve healthy lifestyles through education to decrease chronic illness and comorbid conditions of a significantly at-risk occupational population. The impact of this education was immediate and verified with quantitative measurement and statistical analysis. Results demonstrated that after nurse-led health education, transportation drivers reported significant changes in health responsibility, nutrition, and physical activity. Key recommendations for transportation employers to improve driver health, extend the careers of experienced drivers, and contain insurance costs associated with worker's compensation, disability, and health include (a) instituting employee health education programs, (b) encouraging and incentivizing participation in health and wellness programs, and (c) examining further dynamic education opportunities to improve the health of transportation drivers.

Keywords: truck drivers, Federal Motor Carrier Safety Administration, obesity, occupational health, lifestyle choices, health promotion model, transportation drivers

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Chapter 1: Introduction

The health of commercial transportation drivers and roadway safety is a national concern and health promotion opportunity for occupational nurses. The Bureau of Labor Statistics (2015) reported an estimated two million tractor-trailer commercial motor vehicle (CMV) drivers working in the United States in 2014 and further projected a 5% increase in CMV drivers by 2024. The occupational health risks, as well as the risk of a motor vehicle crash associated with the demanding responsibilities of controlling very large trucks by unhealthy transportation drivers, is a public safety concern (Thiese et al., 2015). Innumerable acute and chronic health problems are compounded by unhealthy lifestyle behaviors prevalent and increasingly recognized as common characteristics of drivers working in the transportation industry (Gilson et al., 2017). A growing number of commercial transportation drivers (CTD) have well-documented smoking and obesity habits, chronic health conditions such as diabetes, high blood pressure, musculoskeletal issues that are aggravated by a sedentary lifestyle and weight, and chronic respiratory conditions (Thiese et al., 2015). The Cardiovascular Advisory Panel Guidelines for Examination of Commercial Motor Vehicle Drivers (Blumenthal et al., 2002) identified major health disparities over three decades ago. More recent research findings have suggested that the occupational work environment can strongly influence the recognized health disparities (Thiese et al., 2015). The maximum exercise level of CTD was found to be significantly lower when compared to the general US population (Blumenthal et al., 2002). Lifestyles of poor exercise, obesity, and smoking contribute to similar physiological findings throughout existing research, and US drivers have unmanaged heart disease and higher comorbidities compared to other labor occupations (Thiese et al., 2015).

The Federal Motor Carrier Safety Administration (FMCSA) is the lead government organization in charge of monitoring the safety of CMV and CTD by regulating the roadway transportation industry and issuing driver health guidelines for mandatory physical examinations (Stern et al., 2018). Incalculable health conditions of truck drivers or the sequelae of these conditions impact an individual's work status along with public safety. More importantly, this potentially affects the length of a driver's lifespan and quality of life. Having a chronic disease can potentially cost a person who is less than 65 years old as much as one-third of their potential life years (Larsen, 2016).

Occupational health FMCSA medical examiners routinely identify a late diagnosis or suboptimal treatment of an illness, along with CTDs denying existing health conditions. Larsen (2016) explained that illness is not only a specific health condition but encompasses how the disease is perceived and managed by the individual, their family, and the health care provider. Often a chronic disease diagnosis is viewed by a CTD as a temporary health condition that will resolve after receiving short-term treatment and has no long-term health consequences. Thus, a driver may discontinue one or more medications, believing it is no longer necessary. Often, a CTD will fail to follow up for conditions such as diabetes, hypertension, or hypercholesterolemia (Stern et al., 2018). A patient who is inept, dependent, or passive has the potential to manage chronic disease ineffectively (Bemker & Ralyea, 2018).

When a driver's knowledge deficit or poor understanding of important health information occurs, valuable time, health, and life can be lost. Chronic disease is often manageable, leading to improved health, but chronic disease is not often cured (Bemker & Ralyea, 2018). The FMCSA requires physical examinations of a CTD to evaluate the status of current conditions and screen the CTD for developing or undiagnosed conditions. Trained nurse practitioners with

specialized skills in comprehensive health history taking and physical assessment skills, having completed an approved FMCSA medical examiner course, are qualified to determine if a CTD meets health standards and guidelines (Ladwig, 2006). The purpose of this project is to demonstrate that an occupational health FMCSA medical examiner nurse practitioner is ideally suited to conduct an investigation of health improvement education opportunities with CTDs.

The Significance of the Population of Interest

CTDs are a vulnerable working-class population walking quietly in and out of occupational health clinics every day. This population is often covered by commercial-employer sponsored health insurance though continues to be unhealthy. The work patterns of CTDs are consecutive long days with lengthy routes, and job assignments can be as far as coast to coast and for numerous weeks at a time. The FMCSA Medical Examiner Handbook (2014a) describes the possible variable driver schedules, as noted below:

> Some of the main types of drivers include the following: turn around or short relay drivers return to their home base each evening; long relay (drivers drive 9-11 hours and then have at least a 10-hour off-duty period); straight through haul (cross country drivers); and team drivers (drivers share the driving by alternating five-hour driving period and five-hour rest periods; FMCSA, 49 CFR 391.43).

The CTD work environment is strongly influenced by challenges related to highway and traffic conditions, weather, physically rigorous duties, and social isolation. Some CTDs are homeless and may live entirely in their company truck, keeping only a post office box in their driver's license state. The demanding work schedules, stress, and CTD responsibility for the cargo load with reduced access to healthcare and separation from family and friends can manifest into

innumerable unhealthy lifestyle habits. The characteristics of this work environment are a "perfect storm" to the development or worsening of chronic and acute health conditions.

Some limiting FMCSA health conditions, such as diabetes, hypertension, and heart disease can be prevented or improved with modifiable lifestyle choices (American College of Cardiology, 2017). The unique sedentary work conditions for a CTD can be a health limiting environment, and "Once within the profession, however, commercial drivers have a higher propensity to develop hypertension than their peers in other professions" (Blumenthal et al., 2002, p. 51). In a regulatory attempt to improve the safety of national and state highways, the FMCSA has determined safe hypertension guideline parameters for CTDs. This guidance is for FMCSA Medical Examiners (FMCSA ME) performing driver health certification exams and to help monitor debilitating health conditions of a CTD. Substantially shorter than the allowable two-year certification period is to be given for CTDs with hypertension (FMCSA, 2014a).

Hypertension and other diagnoses can limit a CTD's capacity to work until critical health status improves. The FMCSA hypertension minimum standards are based on the now older recommendations of *The Sixth Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure* ("The Sixth Report," 1997). Per the current FMCSA guidance, identification of new hypertension during a certification exam limits the driver to only a 30-90 day certification or disqualification (FMCSA, 2014a). In many instances, uncontrolled hypertensive drivers that are unable to attain FMCSA health certification are forced to be off work or even lose their job. The FMCSA (2014b) recognizes that an unhealthy CTD has an increased risk of sudden incapacitation, causing a vehicle wreck or other accident. In many situations, the downward spiral of a CTD without a driving job, experiencing loss of income and

the fear of suddenly being unable to provide for themselves and family is the strongest motivator to seek care as soon as possible for innumerable disqualifying health conditions.

The focus of this evidence-based education project is to influence improvements in lifestyle choices to prevent developing or worsening health conditions in the CTD population. As a nurse practitioner, daily conversations and interactions with CTDs present new and challenging health teaching opportunities. Most often, CTDs respond well to one-on-one basic health information teaching. Handouts and discussions about hypertension and simplistic explanations of a nutrition label diagram occur daily. In addition to the routine teaching of preventive health measures and screenings with all forms of tobacco cessation strongly encouraged. However, a CTD may deny health conditions or refuse health information.

Purpose of the Study

The purpose of this project is to demonstrate that two weeks after an education session of a free national health campaign, cargo transportation drivers will express improvement in healthy lifestyle behaviors.

Research Question

Can an evidence-based educational session for cargo transportation drivers improve lifestyle behaviors of physical activity and nutrition along with health responsibility?

PICO Question

Population - Adult transportation drivers based in North Texas

Intervention - Education of physical activity, nutrition, and health responsibility

Comparison - Lifestyle behavior assessment, pre- and posteducation session

Outcome - Report increase in healthy lifestyle behaviors

Hypothesis

The hypothesis of this project is as follows; an evidence-based educational session can improve lifestyle behaviors of physical activity and nutrition along with health responsibility in cargo transportation drivers.

Definitions

The following terminology is used often in this project paper and warrants clarification.

Cargo transportation drivers (CTDs). English-speaking adults, 21 years of age and older with a state or FMCSA recognized commercial driver's license.

Federal motor carrier safety administration (FMCSA). Division of the United States Department of Transportation, the regulatory agency issuing guidance for medical health certification periods and setting health standards for drivers.

Federal motor carrier safety administration medical examiner (FMCSA ME). A physician, nurse practitioner, physician assistant, or chiropractor who performs FMCSA medical examinations for driver health certification after completing approved education courses and passing the certification exam.

Health certification period. Two-year maximum health certification, possibly shorter, given for health conditions and must be performed by an FMCSA ME.

Institutional review board (IRB). IRB approval is federally required for all human research studies and was required for the continuation of this project.

Scope of Project

The project took place in North Texas. The total length of this project was four months. Volunteer CTD participants were uncompensated English-speaking adults and employed full time as transportation drivers. Specific limitations include the participant population being

primarily men, and the data collection by pre- and posteducation was self-reported. Other study limitations include low convenience sampling because of time and cooperation restraints of work duties, and study completion restraints allowed enough time for only one education session.

Chapter 2: Literature Review

Purpose

This chapter provides a thorough review of the existing literature that guides this nursing project to improve the health of CTDs. According to Gilson et al. (2017), "Health problems and poor lifestyle behaviors are widely recognized as being endemic to the transportation industry" (p. 468). This project examines if a free evidence-based health education campaign session will result in CTD participants self-reporting improved lifestyle behaviors related to health responsibility, physical activity, and nutrition. Conversations with transportation safety managers and an analysis of research for consistency and population patterns were necessary for the deeper examination of the CTD population. The opportunity for collaboration with locally owned and international transportation companies in North Texas has the potential to influence industry changes.

Currently, there is a trend in the transportation industry to improve CTD health, thus decreasing work-related injuries, reducing time off from work, and lowering group health insurance costs. Occupational professionals have published research studies that report isolation, along with the characteristics of the CTD sedentary work environment, contribute to worsening health conditions. All healthcare providers, especially those within occupational health, must best utilize their patient/provider time to educate and improve the health of this high-risk population, and "In line with a change in paradigm, there must be a shift in the role of the healthcare providers from fixer to coach, enabling empowerment as much as possible in people facing health challenges, whether acute or chronic" (Loiselle & Ahmed, 2017, p. e387).

Literature Search Design

A literature review was conducted to identify research, clarification, and publication of the current state of health in the CTD population. The literature search of expert research publications began with the identification of the problem of interest and cultivation of a project PICO question. The printed materials of the literature search from both federal agencies and professional journals of CTD health were multifaceted.

The databases utilized were Medline, OVID, CINAHL, PubMed, and EbscoHost. Search words utilized included the Federal Motor Carrier Safety Administration, truck drivers, cardiac disease, hypertension, roadway safety, sleep apnea, metabolic syndrome, driver morbidity, and the Pender health promotion model. An initial literature search produced over 22,000 published articles. The more specific and most productive literature search utilized the Medline database exclusively with specifically full-text articles published in English after 2011. This search yielded 52 relevant articles published in reputable journals from around the world.

Synthesis and Critique

This research literature synthesis summarizes the similar findings of other studies completed with CTD populations. The reviewed research demonstrated quantitative examples of what FMCSA ME are seeing clinically and the increasing concerns about the health of the CTD population over the last 30 years. Thiese et al. (2015) studied 96,591 FMCSA driver physical examinations and presented the alarming findings of increased obesity and risk for injury along with significantly increased chronic health conditions among CTD at the 2016 Transportation Research Board's 95th Annual Meeting. The concerns raised with this monumental research included increased obesity, increased illnesses and injuries with obesity, and shorter health certification periods for drivers with obesity and at least one identifiable health condition (Thiese

et al., 2015). The FMCSA (2016) also reported worsening chronic health conditions within the CTD population across the United States of America; specifically, high blood pressure had risen from 12% of drivers in 2005 to 25.3% of drivers in 2012.

In the early 1990s, the intensive inquiry began into the health of the occupational driver population. Researchers at this time identified the first health disparities in truck drivers with exposure to diesel exhaust fumes, and these South Pacific drivers had substantially increased mesothelioma lung cancer (Menvielle et al., 2003). In the same study of this driver population, researchers incidentally found that consumption of leafy green vegetables had cancer deterrent properties (Marchand et al., 2002).

In the 1990s, the development of occupational health medicine as a specialty field began with the incorporation of Occupational Health and Safety Administration (OSHA) surveillance programs, worker injury prevention and care, and the concept of preventive health medicine in the United States. The Motor Carrier Safety Improvement Act of 1999, signed by President Clinton, established the FMCSA on January 1, 2000. The FMCSA's mission statement has remained unchanged since 2000: "to prevent commercial motor vehicle-related fatalities and injuries." In 2014, a monumental step to improve driver health and roadway safety occurred when the FMCSA mandated all commercial drivers must have medical examinations (CDME) performed only by a national registry-certified FMCSA ME at least every two years to maintain driver status. In brief, "The commercial motor vehicle driver medical examiner aims to ensure that commercial drivers can safely perform all driving and nondriving work-related tasks" (Hartenbaum, 2010, p. 975).

Thiese et al. (2015) examined the data of 88,246 FMCSA driver examinations from 2005 to 2012, which was used to examine CTD Body Mass Index (BMI) and FMCSA disqualifying

health conditions. The specific health conditions identified by this research were hypertension, diabetes, pain, stroke, cardiovascular disease, and nervous system disorders. Findings in this sizeable American driver population showed 53.3% were obese (>30 BMI), and the most impressive was 26.6% of the entire population found to be morbidly obese (>35 BMI). Morbid obesity increased by 8.9% along with the presence of three or more comorbid conditions fourfold from 2005 to 2012 in these drivers. Critical findings revealed that CTD who were overweight, obese, and morbidly obese received shorter CDME health certificates and reported more often having an injury or illness less than five years before their examination.

Marqueze, Ulhôa, and Moreno (2013) reported study results of increased cardiac risk factors despite the time of day a driver works or the level of physical exercise activity outside of driving in 57 Brazilian males. Further findings of this study are the potential weaknesses in the reliability of a driver's self-reporting unhealthy lifestyle behaviors such as smoking status. A nutrition-focused research study conducted by Jacobson, Prawitz, and Lukaszuk (2007) further confirmed the unhealthy trend of American CTD weight and biometrics. This study found that 70% of the 92 male drivers in the population, being predominantly 40-50 years old, were obese or overweight. Interestingly, this study was conducted at a truck stop restaurant, and all participants self-reported the same degree of importance in making their healthy food choices. Research "Findings indicated that healthful choices were important to drivers—it was encouraging that there was no difference in perceived importance based on anthropometric measurements" (Jacobson, Prawitz, & Lukaszuk, 2007, p. 2127).

Lemke, Apostolopoulos, Hege, Wideman, and Sonmez (2017) examined the work, sleep, and cholesterol levels of a CTD population. The purpose of this study was to create a cholesterol profile of CTD to determine to what degree cholesterol levels could be affected by having a

driving occupation. This study synthesized data from 262 participants with a mean age of 47.8 years old. Clinical findings of this study further aligned with the unhealthy trend and reported CTD having a high-risk cholesterol profile, poor sleep quality, and work-organization factors that may influence unhealthy cholesterol. The FMCSA analysis division reported a record number of 167,239 crashes of large trucks and buses in 2016 despite regulation changes (United States Department of Transportation, 2018). The projected total number of crashes for 2017 were also expected to exceed the prior record. These numbers are in spite of health examination regulation changes, and all CTD now having a more regulated health examination than previously performed. A table found in Appendix A outlines the numerous evidence-based research studies discussed as well as others relevant to this study project. The specifics of each study's population, research process, and unique results as published in professional journals are identified. Appendix A identifies the common research themes, limitations, and opportunities for the continuation of research work in the CTD population (see Appendix A).

Theoretical Framework Applied to Population

Researchers have noted that "All studies need to have an underlying framework that organizes the analysis by stating how all of the variables are expected to relate to one another" (Kellar, Kelvin, & Munro, 2013, p. 9). The health promotion model (HPM) is a middle-range theory Dr. Nola Pender first published in 1982 and revised in 1996 (Petiprin, 2016). A pillar in the realm of nursing theory as well as preventive health, the seventh edition of *Health Promotion in Nursing Practice* is now available to all researchers (Pender, Murdaugh, & Parsons, 2015). It is explained in *Health Promotion in Nursing Practice* that the HPM was developed from the Value-Expectancy Theory and Social Cognitive Theory in the 1950s because inexpensive public health disease screening was being underutilized (Pender et al., 2015). Dr. Pender summarized in

the HPM precursor, the social cognitive theory, as “Thoughts, behavior, and environment interact. For people to alter how they behave, they must alter how they think” (Pender, 2011, p. 2). The HPM is “viewed as potentially useful to predict individuals who would or would not use preventive measures and to suggest interventions that might increase the willingness of resistant individuals to engage in preventive behaviors” (Pender et al., 2015, p. 29). Petiprin (2016) described Dr. Pender’s strong motivation for health promotion and disease prevention in the following way: “She became convinced that patients’ quality of life could be improved by the prevention of problems before this occurred, and health care dollars could be saved by the promotion of healthy lifestyles” (para. 5). In the seventh edition of *Health Promotion in Nursing Practice,* the US Preventive Services Task Force and Community Preventive Services Task Force guidelines for health promotion identified nurses as being an integral part of reaching the goals of Healthy People 2020. Dr. Pender explained nurses must be part of this leadership team, “Nurses must be bold and creative in health promotion” (Pender et al., 2015, p. xv).

The HPM was selected during the literature search of this at-risk population. A major concept of the HPM and a modifiable participant factor is situational influences, which “are personal perceptions and cognitions of any given situation or context that can facilitate or impede behavior” (Sakraida, 2017, para. 18). Independent variables of this study are driver occupation, years of driving experience, age, and educational background. Dependent variables are preeducation and posteducation scoring of the Health-Promoting Lifestyle Profile II (HPLP II) of CTD self-reported current lifestyle practices and perception of health.

The HPM has two focus areas and includes six subsections, thus influenced by an individual’s competing demands and an individual’s commitment to a plan of action. Both of these aspects are critical to the success of preventive health interventions (Pender et al., 2015).

Of note, “Pender’s positive view of health permits the development of nursing interventions that are not limited to decreasing risks for a disease but also aimed at strengthening resources, potentials, and capabilities” (Peterson & Bredow, 2017, p. 228). The HPM is a holistic approach to the experiences and characteristics of the individual by encompassing prior related behavior and personal factors, and “Clients have the power and skill to change health behaviors or modify health-related lifestyles” (Pender et al., 2015, p. 27). The HPM framework demonstrated effectiveness in reducing blood pressure as a result of self-care behaviors in 671 hypertensive Iranian patients in a cross-sectional study (Sharifirad, Kamran, Azadbakht, Mahaki, & Mohebi, 2015).

In this nursing education project, the HPM guided appropriate nurse assessment and education intervention with motivation for improved lifestyle behaviors of CTD. Before and after the evidence-based education session, lifestyle behaviors were objectively assessed with the HPLP II tool. The HPLP II is published in multiple languages and shown to be effective for quantitative behavior measurement in innumerable studies also utilizing the HPM (Meihan & Chung-Ngok, 2010; Mohamadian, Ghannaee, Kortdzanganeh, & Meihan, 2013).

Dr. Nola Pender granted permission to use the HPM and HPLP II via personal email communication on September 20, 2017 (see Appendix B). Dr. Pender is Professor Emerita at the University of Michigan School of Nursing and available by email from the university website. Dr. Susan Walker has prepared permission for the use of the HPLP II tool in an undated letter on the University of Nebraska Medical Center College of Nursing webpage (see Appendix C).

Search Limitations and Impression

Database literature research is limited by the subject and publication coverage of driver occupational health topics. Utilizing the FMCSA webpage and governmental publications, in

addition to the US Bureau of Labor Statistics and Centers for Disease Control and Prevention (CDC), was necessary to understand better the health and occupational specifics of this working population. The limited availability of full-text English articles is potentially a missed opportunity to apply existing research to this project. Based on a review of the literature, the overall health of the CTD population is worsening. Nutrition and sedentary lifestyle choices compound the decline of CTD health and the increase in dangerous driving risk factors. Lifestyle behavior choices are the dependent variables in this study. A CTD's unhealthy situation can be further compounded by required time off from work because of a disqualifying health condition or medical situation identified at the time of the required FMCSA health examination. Obesity, along with other chronic diseases such as hypertension, diabetes, sleep apnea, and coronary heart disease, can potentially be improved with education and lifestyle changes. A CTD's sedentary occupation appears to contribute to the development or perpetuate existing health conditions that can lead to sudden driver impairment or incapacitation, thus contributing to highway accidents. The processes used in this literature research were variable. However, there are consistent findings of CTDs from all around the world having similar unhealthy conditions, especially CTDs in the United States.

Chapter Summary

As an FMCSA ME, the reviewed literature and research findings accurately describe the clinical presentation of the CTD population. Despite the FMCSA changes initiated in 2014 to make America's roadways safer, an individual CTD's work environments has not changed. Industry safety professionals, FMCSA ME, and occupational health providers witness CTDs avoid medical care out of fear for the identification of a work-limiting condition, along with the burden of unplanned medical expenses. A CTD often perceives exercise as a luxury, especially

when the necessity of earning an income is their priority. In the literature search, the value of healthy nutrition and drink choices was found not to be any lower in obese drivers; thus, quite possibly, the poorer choices are being made are because of the lack of education, preparation, or cost. The literature reviewed supports further investigation with interventional education in the form of a nursing study project to help reduce obesity and unhealthy CTD lifestyle.

Chapter 3: Research Method

This chapter explains the appropriateness and methodology for the application of the chosen theoretical framework, utilization of the HPLP II measurement tool, the IRB approval process, specific methods of data collection and analysis, and dissemination study findings. The methodology of this education-based study project adhered to the standards required for human participant studies and supported the problem of interest. This study examined dependent variable change after an evidence-based education presentation to improve behavioral lifestyle choices of the CTD labor population. Improving CTD health and roadway safety in the United States by utilizing a health education campaign holds the potential to influence future research; therefore, an investigation utilizing the quantification of CTD lifestyle behaviors was performed.

Project Design

This education-focused study was designed to demonstrate that CTD participation in an education session can potentially improve lifestyle behaviors. Increasing health literacy in CTDs is one opportunity to slow the declining health in this occupation. The education sessions were conducted to attain a study population size of at least 50 CTDs completing the posteducation HPLP II tool. The evidence-based educational campaign session, Move Your Way (2018), encourages positive lifestyle behavior improvements and was appropriate for group presentation and interaction. I am an FMCSA ME nurse practitioner who had conducted over 1,000 FMCSA certification examinations at the time of this study. I organized and presented five group educational session. My qualifications to conduct the education sessions include a master's of nursing degree with a clinical focus of family medicine and the completion of FMCSA ME education and required testing in 2014. I have completed 18 hours of education within 12 months on topics such as performing difficult FMCSA CTD examinations and FMCSA health

regulations. I have attained a certificate for Adult Obesity Management in Family Practice from the American Academy of Nurse Practitioners. Nurse practitioners have experience in health literacy assessment, along with an increased intent to implement effective literacy strategies to improve the populations and an individual's health (Cafiero, 2013).

Instrument Measurement Tool

The HPM, along with the HPLP II, appropriately quantified participant data and guided the education intervention along with an evaluation of the effectiveness of the 30-minute group education session. According to Peterson and Bredow (2017), "The Model encompasses both behavioral and environmental changes to effect improvements in a society where lifestyle factors account for a large proportion of health problems" (p. 237). Dr. Susan Walker developed the original Healthy-Lifestyles Profile tool, which was revised as the HPLP II in 1995 (Pender et al., 2015). The HPLP II tool is a 52-item questionnaire with six domains. The HPLP II is simplistically written with self-reported answers on a four-point scale (*never*-1, *sometimes*-2, *often*-3, and *routinely*-4). For more specific results, 26 questions from three domains of the HPLP II tool were used as the pretest and posttest for this study (see Appendix D). The HPLP II subsections used in this study were health responsibility, physical activity, and nutrition. The three domains of the complete HPLP II not used in this study were spiritual growth, interpersonal relationships, and stress management. HPLP II is a self-reporting pencil-and-paper tool for the quantitative measurement of lifestyle behaviors. The HPLP II applied to this population because of the simple structure of self-reporting on a four-choice scale of ordinal data. The HPLP II questionnaire required 15 minutes or less to complete the 26 questions.

Data Collection

The sites of data collection and group education sessions were within the transportation community at the office space of two similar but unrelated transportation employers. Both of these company sites are located in North Texas. The HPLP II tool was administered to collect baseline preeducation data at the time of consent. Reaching the designated participant population size of 50 individuals served to successfully generalize the study results in a much larger CTD population. The 30-minute education presentation followed the group consent procedure. Ordinal data was collected again two weeks after consent and the education session. Physically collecting the two-page self-reporting questionnaire from each participant was required. I performed the physical collection of ordinal data for the posteducation questionnaires. A contact plan to increase driver participation and completion of the two-week posteducation data collection was utilized. If a driver could not attend the second data collection date or the next onsite scheduled meeting, the posteducation participant questionnaire data was gathered by phone. An email was found to be a less effective means to communicate with the CTD. Permission for either a phone conversation or email exchange in order to complete the second questionnaire was obtained at the time of consent. This data collection contingency plan was utilized for continuity and efficaciousness because of the likelihood that a driver would be unable to attend the following meeting because of travel and transportation work.

At the time of consent, it was explained that all participant demographic information and questionnaire answers would be unidentifiable and assigned a participant code at random. I also explained that no individual names, answers, or degrees of change between the two HPLP II questionnaires would be calculated or reported to any entity. No individual CTD information was calculated or released to the transportation employers, health insurance agency, or FMCSA

examination facility. The consent to participate in this volunteer study strictly followed the ACU Institutional Review Board (IRB) guidelines for evidence-based studies that do not collect the Health Insurance Portability and Accountability Act (HIPPA) protected health information. The date of ACU IRB approval for this project was June 20, 2019 (see Appendix E). No other IRB approval was needed to conduct this education study. The ACU consent form, version January 1, 2018, was utilized in this study (see Appendix F).

There was minimal risk to the participants in this study, and participants did not receive compensation for participation. The conditions of participation and the right to withdraw from the study were explained at the time of consent, as well as being written in the approved consent form. A copy of the consent was given to all participants at the first encounter at the time of signing the consent to participate.

I presented the Move Your Way (2018) education material with the free literature and resources that were made available for CTDs to take with them. The Move Your Way campaign is a public domain from the Office of Disease Prevention and Health Promotion (DPHP) and health.gov for healthy adult eating and physical activity. This education holds a strong emphasis on feeling good along with health benefits, as opposed to losing weight education for improving physical appearance and strict dieting. Bemker and Ralyea (2018) concluded that "Weight reduction is not a simple task, so showing patients the possible rewards, such as improved quality of life beyond the obvious physical change, can help pique their interest in the journey" (p. 280).

Data Management and Analysis

Two weeks after the education session, participants completed the same HPLP II questionnaire, either by phone or onsite at the next scheduled meeting. I managed the data

collection sheets and made preparation for the statistical analysis for results. Random participant numeric identifiers, along with both questionnaire data results for each of the three subsection domains, were organized into a data set. The CTD demographic variables and questionnaire responses were electronically formatted in an Excel spreadsheet for electronic transmission to the statistician. The participant names and individual answers to questions were protected to the fullest extent with no lapse in information protection. Study and demographic information of participants were maintained electronically and followed strict privacy expectations with password protection and data encryption. The paper self-report forms and consents, along with the master code list of participant protection identification codes, will be maintained electronically for at least three years by ACU nursing department faculty, who will maintain strict adherence to the ACU IRB research record retention policies.

At the initiation of this project, a priori power analysis was conducted with a statistician to determine the appropriate population size needed to attain generalizable results was greater than 34 participants. Paired *t* tests were utilized for comparison of the three domain means, each question having two points of data for calculation. The study population cumulative and each domain's pretest mean were calculated and compared to the opposing posttest mean scores of the three categories and cumulative score using the Statistical Package for the Social Sciences (SPSS). The domain pretest means were compared to the domain posttest means to determine the quantitative degree of reported healthy lifestyle change. The population pretest and posttest mean of the entire HPLP II were also compared to demonstrate the change in the total CTD population. To ensure the reliability of data calculations related to accurately answering the PICOT question, analysis with SPSS and collaboration with a research statistician occurred. The acceptable level of statistical significance for this study was determined to be $p < .05$; "The probability of

acceptable level of significant differences will be found between the groups in the intervention by chance alone is 5 out of 100 times" (Keele, 2011, p. 71).

Methodology

I was the sole educator and data collector of this study. My duties included, but were not limited to, obtaining consent from participants, protecting participants with ethical research study standards, data entry, as well as organizing and presenting the study findings for the continuation of CTD research. I maintained uninterrupted enrollment at ACU within the Doctoral of Nursing program for the length of this study. I maintained FMCSA ME certification requirements and Texas Board of Nursing licensure expectations in the role of a Family Practice Advanced Registered Nurse Practitioner. I retained American Academy of Nurse Practitioners Certification Board recognition with professional conduct when performing all activities. I completed the required ACU IRB required researcher education and certificate before beginning the implementation of this project.

The CTD population and problem of interest were identified, a PICOT question determined, and the literature search completed to identify the state of the health problem and the need for further investigation. The literature search supported delving into an examination of the lifestyle behaviors of this occupational field. Ethical standards of human participant research studies were reviewed extensively and maintained throughout this study. The identification of applicable theory framework and a validated data measurement tool to support this project's hypothesis, along with preliminary research of recruitment locations for the study, were completed. An overview outline of the project plan process was prepared for simplicity and presentation to partnering transportation managers (see Table 1).

Table 1

Project Plan Process

Participant Group	Clinical Outcomes
The study explained to prospective study volunteer participants, complete signed consents.	Statistical analysis calculation of participant data by statistician.
Preeducation - CTDs complete the three sections of the HPLP II tool for baseline data - 15 min.	Determination of the degree of lifestyle changes in the individual three categories of the group and overall change of the three categories of the group from pretest vs. posttest HPLP II tool.
Education session with Nurse Practitioner, *Move Your Way* campaign - 30 min.	Dissemination of study findings.
Posteducation- Complete the same three sections of the HPLP II tool (two weeks after education) - 15 min.	
Data collection continued until the goal >34 CTD completed the posteducation HPLP II	

Feasibility and Appropriateness

The location for participant recruitment and education interaction was investigated for appropriateness and feasibility to attain a representative population of CTDs. This study was approved and supported with guidance from ACU DNP faculty, ACU IRB, faculty project chair, and a project committee. This study was appropriate and implementable with the support of two national and internationally recognized transportation partners. Innumerable transportation leaders located in the Alliance Corridor in North Texas, had expressed a strong interest in developing health education programs specific for CTDs. The partnering businesses were chosen because of their location and heightened awareness of declining CTD health. Company safety directors and transportation managers have recognized CTDs are becoming unhealthier at a rapid rate. National transportation companies welcomed both nurses and FMCSA ME nurse

practitioner presence to educate drivers at safety meetings for more than the past three years. The timing was appropriate for this study due to the surge in transportation growth in north Texas over the past 12 years. There was a likelihood of an adequately mixed-race study population due to the cultural diversity that currently exists in the expansion of North Texas. The study population was supported in this area due to the regional industry shift toward preventive health measures and the Healthiest City Initiative to attain the Blue Zones Project (2017) recognition: "Blue Zones Project is a community-wide well-being improvement initiative to help make healthy choices easier for everyone." Also, the most motivating factor in pursuing effective modalities to improve driver health beyond 2019 is to address the knowledge deficits that CTDs express during clinical FMCSA health examinations.

IRB Approval and Process

This project was presented to the ACU Nursing and Graduate School Project Committee, in addition to the Abilene Christian University IRB for permission to implement this minimum risk education study. An IRB approval was required for all research and study projects involving human participants before initiating any data gathering activities to ensure minimal risk to participants and the elimination of any possible coercion. The required National Center for Professional and Research Ethics, Ethics CORE CSL: Coordinated Science Lab modules were completed during the ACU spring 2018 semester. The National Institute of Health Office of Extramural Research certificate for the web-based training course, "Protecting Human Research Participants," was attained before application for ACU IRB approval.

Interprofessional Collaboration and Practice Setting

This project encompassed multilevel perspectives that lead to health-promoting goals and the sustainability of CTD education programs. Collaboration during this project occurred with

ACU capstone chair and participating transportation safety directors. This project served to strengthen these partnerships to improve the health of CTDs while empowering transportation managers with health information resources.

This project was conducted at two unrelated transportation sites in North Texas. The locations of the study were selected because of the level of familiarity and easy presentation of education information to the CTD. Study process explanation and participation consent took 20 minutes before the beginning of each 30-minute education session. The meeting room spaces were climate controlled with accessible restrooms. The CTDs frequented these business locations to attend safety meetings and interact with safety managers or human resources.

Target Population

All transportation drivers with FMCSA health certificates, older than 21 years working with one of the participating companies, were eligible to be included in this study. Holding an FMCSA health certification requires a CTD to have completed FMCSA driving education with knowledge tested as well as possessing the minimum health criteria of the mandatory medical examination. These requirements demonstrated that all study participants have reading and writing skills to be considered proficient in English with basic cognitive skills. The CTD participants' work duties include various driving assignments, such as day distances, two to three day trips, and bi-weekly routes across the United States.

Risk/Benefit

The benefits of CTD participation in this study are formative and potentially immeasurable. Improving driver health for the length of a career with foundational changes through education starts with this project. The benefits of the health information and resources about a CTD's future FMCSA health certification examinations can continue long after

participation in this project, and will be evidenced by subsequent full-length health certifications. The availability of an FMCSA ME nurse practitioner for education and interaction will continue per company request. The goal of a continued nursing presence at transportation safety meetings is a portion of the long-term sustainability plan of this study.

Minimum risks to CTDs were work delay on the day of consent and education and work delay again two weeks later with posttesting. The occupational risk associated with individual and group participation in this study was minimized due to strong employer support of the project. The free education had no associated compensation to the CTD participants. Both the education sessions and study processes were conducted separately from an FMCSA ME health certification examination. Participation in the study holds no levity with a CTD participant's employment status with either transportation partner.

Timeline

The study timeline followed the intention of this project and guided the projection of this research. Adherence to the ACU DNP project timeline was mandatory with minimal flexibility at the time of implementation related to consent, education presentation, data collection, data storage, and data analysis after ACU IRB approval. The total data collection portion of the project was IRB approved to not excede four months and 100 participants in the study. Timeline and population parameters were maintained. The natural progression of this project moved to data management and analysis. This phase required less time than the IRB approval process and investigative collection. Data analysis took two weeks to complete with a research statistician.

The approval of ACU IRB Study Inactivation was December 4, 2019 (See Appendix J). The submission of the final project paper to ACU is a partial fulfillment of the NURS DNP II and III courses. My anticipated DNP education completion and graduation are at the culmination

of the ACU Spring 2020 semester. “The doctorate of nursing practice degree represents the highest level of formal education for advanced nursing practice” (Moran, Burson & Conrad, 2017, p. 15). Further dissemination of study findings to the transportation industry, state and occupational health nursing organizations, and occupational safety professionals extends after the time of study completion.

Chapter Summary

This study was organized and implemented to improve the lifestyle behaviors of CTD with education. This project was developed and presented for approval to the ACU IRB, the DNP Program Director, Project Chair, and Project Committee Members with strict adherence to the ACU DNP program’s professional expectations and processes. The implementation process included the collection of preintervention data during five onsite 30-minute education sessions at the transportation locations. Postintervention data was collected, and participant identification and data were protected to ensure any risk for study participants was minimized. Strict organization and diligent adherence to the project timeline with the progress through the required ACU DNP curriculum were required.

Chapter 4: Results

The purpose of this project was to answer the hypothesis statement with the implementation of an onsite nurse-led education session of a free national health campaign, and finding that CTDs will express improvement in three domains of healthy lifestyle behaviors. A research partnership was created with transportation leaders because of the shared interest in developing dynamic ways to improve the health of CTDs. The study findings influence the quality of CTD life and a multitude of industry professionals' concerns about how to slow or prevent health conditions accelerated by poor lifestyle behaviors. The CTDs expressed and displayed unhealthy habits before, during, and after education sessions.

Project Analysis

Data collection was completed on time in under 12 weeks. The total number of CTD participants who consented, completed the preeducation HPLP II questionnaire, and attended an education session was 71. Of that total, 14 CTDs were excluded from this study due to not completing the posteducation HPLP II questionnaire. The total number of CTD participants in the study population was 57.

The locally-owned national transportation company (Company A) had significantly more CTD participation leadership support. Company A's administrators were enthusiastic about hosting multiple bi-weekly on-site visits. The Company A meeting dates and times were arranged in advance for multiple visits. In all, a total of 48 (84.21%) CTDs from Company A were included in a total of 57 participants. Company B is an international business and recognized as a dominant CTD transportation leader that is making occupational innovations and improvements for CTD. Company B had nine CTD participate in this study through the completion of the posteducation HPLP II questionnaire. Scheduling the onsite education sessions

with Company B was more challenging because of the required corporate and regional approval to be onsite and interact with CTDs.

All participants demonstrated effortless reading and ease with completing the HPLP II tool questionnaires. The CTDs verbalized a clear understanding of the HPLP II questionnaires, as well as the Move Your Way (2018) education material (see Appendix I). The CTDs and safety managers were appreciative of the interaction during the presentation of information. Both companies reported advertising the education session schedules beforehand and were enthusiastic about receiving health information literature. Company A and Company B provided comfortable business meeting room facilities and were very hospitable. The health information, Move Your Way (2018), posters were displayed in the meeting spaces for at least the length of the data collection period. At the time of the last contact, Company A reported the information posters were still displayed within the education and meeting office space.

The two-week posteducation timeline to complete the second HPLP II was strict. The subsequent meeting dates and times were posted and discussed at the time of the education. If a CTD was unable to attend or be contacted by the start in the third week after the education session, that CTD was determined to be "unable to follow up" and excluded from participating in the study. The number of CTDs excluded from the study was below expectation and the excluded CTD baseline data was not included in the data analysis.

Data Collection

Participation in this study was voluntary. Pencil-and-paper data collection occurred with all CTD participants onsite. Each CTD was provided a copy of the consent that included the purpose of the study, individual information protection measures, risk of participation, and the study process. The CTD participants' data were obtained with the following process:

1. All CTDs were welcomed into the meeting space of both respective transportation companies. Eligibility to participate and explanation of the study purpose occurred in an interactive group setting with tables and chairs. I explained participation was voluntary with no compensation. Minimum risks were discussed, along with follow up expectations and the reassurance of anonymity.
2. The consent and individual demographic information forms were completed. The CTDs were given a copy of the study consent, which included my and ACU IRB contact information.
3. The preeducation HPLP II was completed and collected by myself .
4. I presented a 30-minute education session of evidence-based Move Your Way (2018) health education material on physical activity and nutrition.
5. The CTDs were dismissed at the end of the session. Some participants left immediately, others talked among themselves or with safety managers, and some CTDs asked FMCSA health certification questions .

The demographic data obtained at the time of consent was for descriptive analysis. The participants' age, educational background, years of professional driving, and race were collected. This self-reported information provided both personal and professional characteristics of the CTDs and were the predictive independent variables of this population. There was no missing demographic independent data. All interaction with every CTD was positive.

The response or dependent variables of this study were the numeric ordinal data collected from both of the HPLP II questionnaires. Each of the 26 lifestyle questions required an answer on a four-point scale. The CTD chose either *never* (1 point), *sometimes* (2 points), *often* (3 points), or *routinely* (4 points). A total of 52 numeric dependent variables existed for each study

participant. The demographic information and numeric data from the questionnaires were verified and cleaned. There was no missing dependent data. The individual CTD consents and questionnaires were assigned random number identifiers to protect individual answers and information as "Data security is an important issue to consider in any clinical inquiry project and requires a protocol to protect participants" (Moran et al., 2017, p. 364). The demographic and HPLP II data were manually reviewed and entered into a formatted spreadsheet. The dependent variables were identified in individual columns.

Data verification with a double data entry method was performed after each participant's information as it was entered into the spreadsheet. Double-entry method allowed the comparison of two lines of data entry for each participant, and thus helped to identify possible transference errors. "Data entry is a tedious, time-intensive process, and errors are common. Therefore, it is important that the student (researcher) verify the entries to correct mistakes prior to data analysis" (Moran et al., 2017, p. 365). A professional statistician performed the conversion of spreadsheet data to Statistical Package for the Social Sciences (SPSS) for analysis. There was no exchange of identifying information. I retained demographics, both HPLP II, and the participant identification key for the length of the study.

Demographic information was analyzed with SPSS. Mean measurements of the pretest and posttest HPLP II were calculated as a population for each question, each domain, and cumulatively using SPSS since "Of all the measures of central tendency, the mean is viewed as the most reliable and stable" (Keele, 2011, p. 61). The precision knowledge provided means and standard deviations to measure a change in the domains, as well as summative scores for the sample, and "The paired *t* test can help determine whether this average difference is statistically significant or whether it is probably just due to chance" (Keller et al., 2013, p. 133).

Study Results

Descriptive statistics. The age and years of driving experience of the CTD were found to be varied (see Table 2). The total sample ranged from 21 years to 60 years old, with the mean age of 37 (see Figure 1). The mean years of driving experience was 7.862 (see Figure 2). The self-reported race was diverse and balanced (see Table 3). The education of this sample was equally balanced between "college" and "high school" (see Table 4 and Figure 3).

Table 2

Age and Driving Experience

	N	*Minimum*	*Maximum*	*M*	*SD*
Age	57	21	60	37.23	10.353
Years of Experience	57	1	25	7.86	6.452

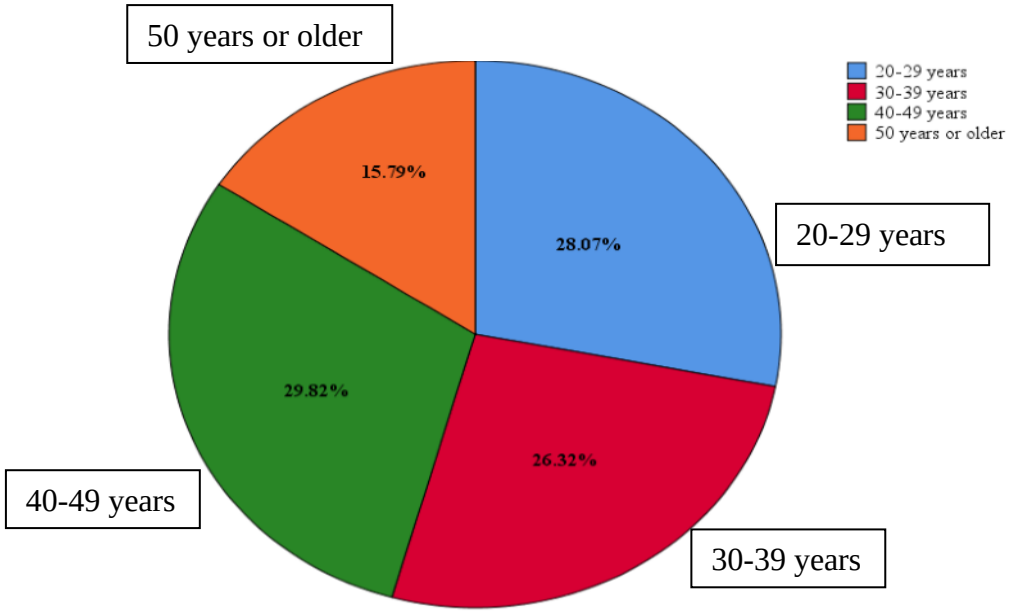

Figure 1. Age of participants.

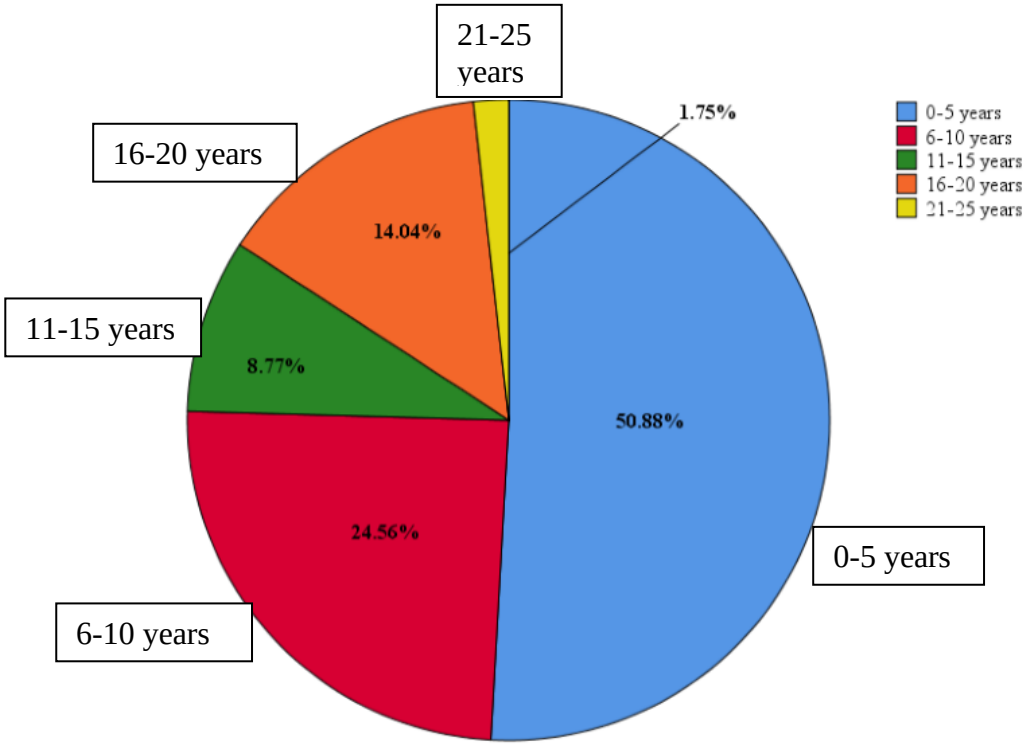

Figure 2. Years of driving experience.

Table 3

Race Reported by Participants

	f	%
African American	21	36.8
Caucasian	13	22.8
Hispanic	19	33.3
Other	4	7.0
Total	71	100.0

Table 4

Highest Level of Education

	f	%
College	32	56.1
High School	24	42.1
No High School	1	1.8
Total	57	100.0

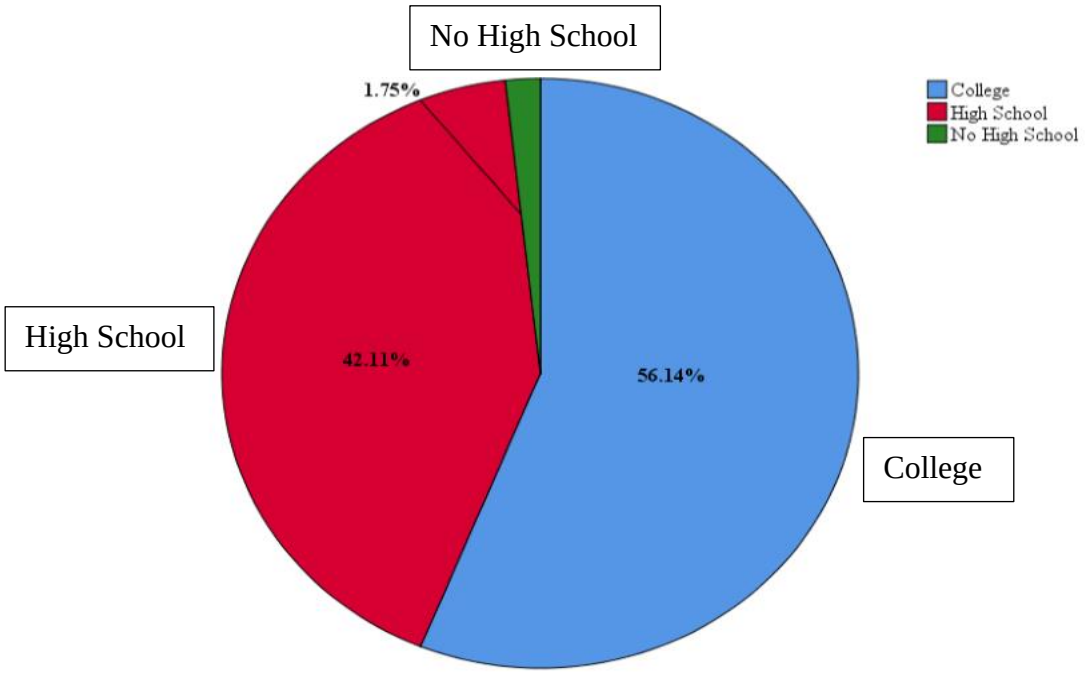

Figure 3. Education of participants.

Quantitative statistics. The results of this study answered the hypothesis that lifestyle behaviors of nutrition, health responsibility, and physical activity could be positively affected by education. The hypothesis was supported and accepted because of the data attained from the HPLP II tool. The population sample was 57 CTD (n = 57). A paired t test was used for the

measurement of each of the 26 variables, with two different nominal values, and "Because pretest and posttest data come from the same person, the data points are correlated and so a statistical technique for matched pairs must be used" (Kellar et al., 2013, p. 131). Overall, there was a significant increase in the cumulative postintervention HPLP II scores of the sample (see Figure 4). The lifestyle behaviors showed a total reported pretest mean value of 59.56 ± 13.604, substantially increasing to 69.09 ± 14.099 for the posttest mean over the course of the study (see Table 5). The results of the paired *t* test data analysis with SPSS measured a significant overall change in the sample that is likely due to the effect of the education intervention and not to chance ($t = 7.046$, $df = 56$, $p < .001$; see Table 6). According to Keele (2011), "A *p* value is a probability that determines whether a difference between two or more interventions is statistically significant enough to change the current standard of care" (p. 71).

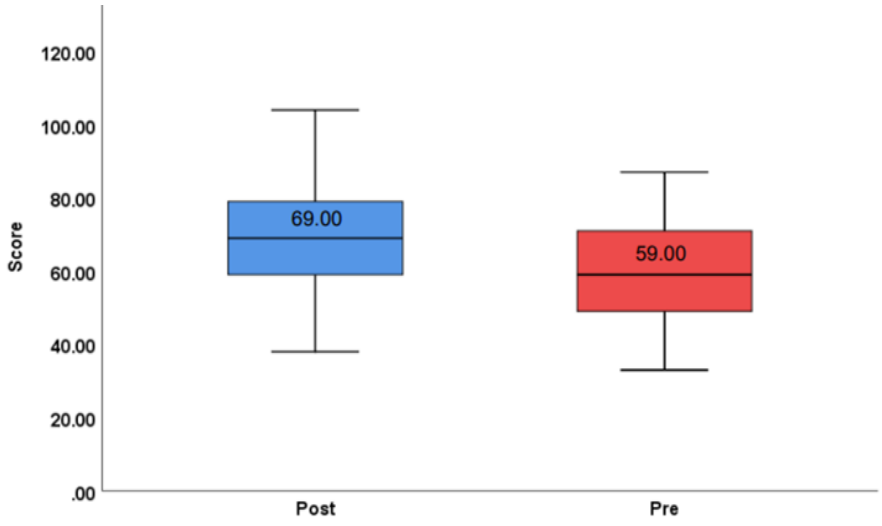

Figure 4. Cumulative HPLP II results.

Table 5

Population Cumulative Score

	M	*N*	*SD*
Total Post Cum.	69.09	57	14.099
Total Pre Cum.	59.56	57	13.604

Table 6

Paired t Test for Total Cumulative Score of Participants

	M	*SD*	*t*	*df*	*Sig* (2-tailed)
Total PostTotal Pre	9.526	10.207	7.046	56	.000

The cumulative increase in each of the three domains was consistently positive on the postintervention HPLP II (see Figure 5). The education intervention likely influenced these changes. The standard deviation decreased in all but four of the group posttest questions (see Figure 6). This is indicative of more consistent responses in the sample after the intervention.

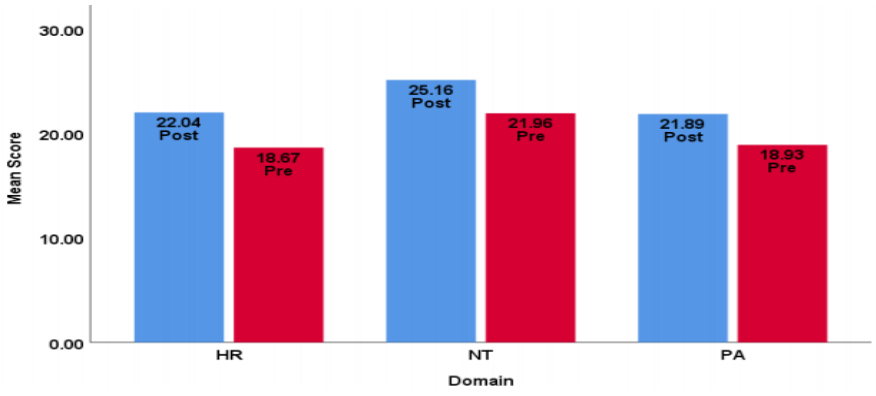

Figure 5. Cumulative domain scores.

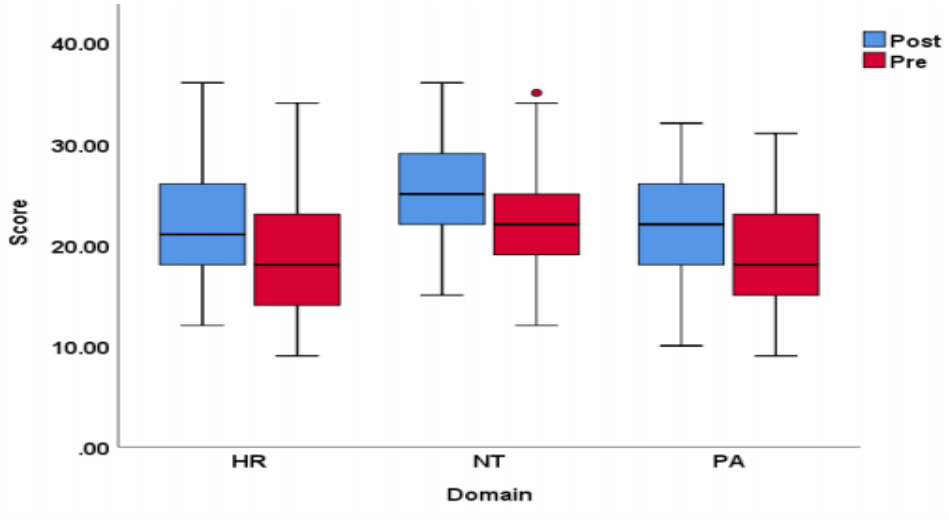

Figure 6. Domain standard deviation scores.

The health responsibility domain had the most variation in the cumulative means of the three domains. The measured increase between the two HPLP II questionnaires was 3.37 (see Table 7). The findings in this domain indicate the potential for improvement in lifestyle behaviors exists, specifically regarding the health responsibility pre and post scoring of question HRPre45. HPLP II question #45 states, "Attend educational programs on personal health care." The pretest mean of 1.56 indicates that within the sample, a strong majority of the CTDs answered with *never* (1) and less often answered *sometimes* (2). HRPre45 was the lowest answered question of the study. The midpoint of the data set is 2.0–2.5; this is due to the HPLP II four-point response format for each question. The posttest answer to #45 was 2.19, and although increased by 0.63, this data continues to stay on the left side of the curve and the lowest response on the posttest questionnaire. The HRPre33 holds the highest mean for the HR domain preintervention. HPLP II #33 states, "Inspect my body at least monthly for physical changes/danger signs." The pretest mean of 2.39 had an incremental increase of 0.31 for 2.70 on the posttest. These results support the in-person findings that CTDs often expresses caring about health and body. HPLP II #33 supports that CTDs were cognizant and took the initiative to

perform health self-care. As researchers have noted, “Health responsibility involves an active sense of accountability for one’s well-being . . . paying attention to one’s health, educating oneself about health, and exercising informed consumerism when seeking professional assistance” (Walker, Sechrist, & Pender, 1995, para. 7).

Table 7

Descriptive Statistics for Health Responsibility

	M	*N*	*SD*
HRPost3	2.44	57	.926
HRPre3	2.25	57	1.005
HRPost9	2.49	57	.805
HRPre9	2.14	57	.766
HRPost15	2.47	57	.908
HRPre15	2.12	57	.965
HRPost21	2.39	57	.959
HRPre21	2.04	57	.981
HRPost27	2.53	57	.826
HRPre27	2.12	57	.946
HRPost33	2.70	57	.906
HRPre33	2.39	57	1.048
HRPost39	2.44	57	.802
HRPre39	2.02	57	.916
HRPost45	2.19	57	.854
HRPre45	1.56	57	.780
HRPost51	2.39	57	.921
HRPre51	2.04	57	.963
HRPostMean	22.04	57	5.666
HRPreMean	18.67	57	5.866

The nutrition domain produced a higher cumulative mean than either of the other two domains. Pretest mean measured 21.96 along with an increase of 3.2 for a posttest mean of 25.16 (see Table 8). Significant to note, nutrition also produced the smallest standard deviation calculations. The sample more consistently answered these behavior questions with 2-3 point responses of *sometimes* and *often*. The posttest mean for each question, with the exception of one, was >2.5 and notably outside of data boundaries and positive. Walker, Sechrist, and Pender (1995) summarized, "Nutrition involves knowledgeable selection and consumption of foods essential for sustenance, health, and well-being" (para. 5).

The physical activity portion of the HPLP II revealed the least amount of change in the cumulative means for the population (see Table 9). The noteworthy increase of 2.96 between the pretest and posttest means was the smallest for the three domains, illustrating some changes in physical activity did occur after the intervention. However, a larger amount of change in this domain may be much more difficult to implement for CTDs. The physical activity findings are consistent with the findings of prior CTD studies and the transportation industry. A sedentary occupation is an integral part in limiting the CTD in performing exrcise movement and weight-bearing activities during a workday (Mansur et al., 2015; Marqueze et al., 2013; Thiese et al., 2015). The data in this domain supports that the CTD were forthcoming and honest, despite concerns about self-reporting physical activity changes over the phone.

Table 8

Descriptive Statistics for Nutrition

	M	*N*	*SD*
NtPost2	2.74	57	.768
NtPre2	2.44	57	.945
NtPost8	2.98	57	.790
NtPre8	2.61	57	.978
NtPost14	2.28	57	.796
NtPre14	1.96	57	.801
NtPost20	2.77	57	.887
NtPre20	2.33	57	.932
NtPost26	2.77	57	.824
NtPre26	2.39	57	.861
NtPost32	2.68	57	.805
NtPre32	2.40	57	1.015
NtPost38	2.86	57	.693
NtPre38	2.51	57	.782
NtPost44	2.81	57	.915
NtPre44	2.44	57	1.035
NtPost50	3.26	57	.835
NtPre50	2.88	57	.888
NtPostmean	25.16	57	4.728
NtPremean	21.96	57	4.950

Table 9

Descriptive Statistics for Physical Activity

	M	*N*	*SD*
PAPost4	2.56	57	.945
PAPre4	2.42	57	.963
PAPost10	2.86	57	.934
PAPre10	2.44	57	1.035
PAPost16	2.91	57	.950
PAPre16	2.53	57	.908
PAPost22	2.74	57	.835
PAPre22	2.47	57	.847
PAPost28	2.84	57	.841
PAPre28	2.35	57	.896
PAPost34	2.98	57	.719
PAPre34	2.61	57	.840
PAPost40	2.39	57	.921
PAPre40	1.91	57	.950
PAPost46	2.61	57	.996
PAPre46	2.19	57	1.025
PAPostCum	21.89	57	5.098
PAPreMean	18.93	57	5.351

Summary of Strengths

The findings of this project provide valuable information to the occupational health niche of the medical community, as well as transportation safety professionals and FMCSA. The strength of this education intervention was in part due to the strong dedication to improving CTD health that is shared by myself and the transportation company leaders at both sites. The CTDs were very agreeable to participate and inquisitive about the health information presented. More than half of CTDs reported collegiate education history, and the balance of race, age, and

education decreased potential bias in this study. Standardized demographic collection forms supported consistent information gathering and could be replicated in further studies for a larger comparison. Contacting the absent CTDs by phone was more successful than projected, although the conversations were lengthier than expected.

Staying within the projected four-month window was in part due to the strong support of Company A. The convenient locations of both Company A and Company B facilitated easy commute and navigation for this project. Additionally, the baseline and postintervention data is a foundation that can support more progressive CTD research. Incorporating a research statistician strengthened the analysis of CTD data, as well as ensuring the accuracy of study results. Utilizing standardized education material for presentation maintained continuity and reliability throughout the implementation portion of the study.

Summary of Weaknesses

The identified limitations of this study included significant work schedule restrictions in which it is speculated to have kept the excluded CTDs from completing the second HPLP II questionnaire. In addition, an indeterminate number of interested CTDs were unable to participate in the study because of scheduled work duties. Numerous CTDs passed by the meeting spaces and inquired about the activity, but the majority of these CTD verbalized needing to continue with their workday. The act of contacting the CTD by phone to complete the follow-up HPLP II questionnaire required a substantial amount of time. This follow-up step was anticipated during project planning. However, phoning the CTD was utilized more than expected due to various reasons reported by participants. The CTDs were markedly less available to complete the posttest HPLP II in-person onsite than originally anticipated.

The advertisement for the project and the opportunity to participate in this study was done by the company partners within their respective organizations. The exact process of advertisement was not clarified by either Company A or Company B. The process for participant recruitment had potential improvement with more variable opportunity to conduct the education sessions during all driving shifts. The consideration that 45 (79%) of the follow-up HPLP II questionnaires were answered over the phone during a conversation and may reflect more positive healthy lifestyle behaviors than CTD self-reporting. Self-reporting data is also a potential weakness due to the nature of subjective lifestyle information presenting bias results. As previously noted, there were too few CTD participants from Company B for an accurate comparison of the two company groups. This was a potential missed opportunity to delve deeper into comparing the culture and effective education in two different CTD populations versus only one.

Recommendations for Future Research and Projects

Further research within the CTD population of a larger sample that receives more than one health education session is needed. A comparison of a larger sample with variable health education dependent variables could produce different results. Utilization of the entire HPLP II questionnaire (52 questions), which includes the three additional domains of spiritual growth, interpersonal relationships, and stress management, would provide a more holistic picture of lifestyle behaviors in additional studies. The potential exists in a population such as this for a learning readiness assessment in which CTDs can relate baseline knowledge and identify desirable health topics in future studies. A further qualitative study is necessary to help ascertain what CTDs perceive as their biggest obstacle to attaining improved health. It would be applicable to better understand if health insurance status can be related to improved CTD

lifestyles due to prescription regimens, preventive health services, and health provider interaction.

Implications for Nursing Practice

This experience was very rewarding. Both the professional interaction and statistical findings hold significant implications for nursing practice, especially for an FMCSA ME. The process of scoring the HPLP II questions was insightful in many ways. The poor scoring of "*never"* in many health responsibility and physical activity questions, such as "Question health professionals in order to understand their instructions" and "Ask for information from health professionals about how to take good care of myself," conveyed a more serious health responsibility deficit than first predicted. Implications for nursing practice, based on the significant findings of this study, demonstrate the positive effect of providing health education to CTDs. Connecting with all clients on a personable level is necessary to understand a particular population and to address specific knowledge deficits, and CTDs are no exception. Professional nursing practice should change with the improved understanding that education opportunities can positively influence individual CTD lifestyle and population health. Professional dissemination of a nursing study's findings is imperative to improving nursing practice and changing client standards of care for the better (Keele, 2011).

Limitations Related to the Scope of the Project

The scope of this study was limited to potential study participants working out of transportation hubs in North Texas. The Centers for Disease Control and Prevention (2018) reported from the Behavioral Risk Factor Surveillance System (BRFSS) that Texas, by population, was one of the more obese states with the average body mass index (BMI) between 34.2 and 39. A sample population working from different regions of the United States could

provide a broader scope of lifestyle behaviors. The BRFSS could be utilized to identify specific areas in the United States to compare a larger and more variable population. Of note, "BRFSS is the nation's premier system of health-related telephone surveys that collect state data about U.S. residents regarding their health-related risk behaviors, chronic health conditions, and use of preventive services" (Centers for Disease Control and Prevention, 2018, para. 2). The scope of this project utilized the available CTD target population. Nursing, along with behavioral, nutrition, and public health professions, has an immense opportunity to continue occupational and lifestyle research with the vast number of working CTD in the US.

Chapter Summary

The purpose of this project was to demonstrate that two weeks after an education session of a free health campaign, CTDs would demonstrate improvement in healthy lifestyle behaviors. Overall, the significant statistical findings support the stated purpose of this study due to substantial increases in both the overall and individual domain cumulative scores. The results of this project effectively answer the research question. Statistical paired *t* tests were used for data analysis, and the results indicate that the education intervention caused the measured change. Strengths and weaknesses of this study were identified, and notably, further research is indicated with CTDs on a much larger and diverse scale with a supportive industry partnership. The implications of this study can be implemented to affect nursing practice and the practice of FMCA ME.

Chapter 5: Discussion, Conclusions, and Recommendations

The hypothesis for this project was stated as, “Can an evidence-based educational session to cargo transportation drivers improve the lifestyle behaviors of physical activity and nutrition, along with health responsibility?” The hypothesis and purpose of this study were to demonstrate that education can influence self-reported healthier behaviors of CTDs, thus slowing the health decline of this working-class population. The data analysis supports the hypothesis and education driven purpose of this study. Implementing health education with dynamic measures for effective dissemination is an essential nurse function. Continuing to educate, CTDs in this instance, in the most effective way is necessary to increase the value of health care, optimize health care spending, improve an individual’s health conditions, and slow the decline of a high-risk occupational health population.

Interpretation of Findings

Significant improvements in the cumulative score of all three domains indicated that at least one group education session was effective in influencing positive change in behavior. The CTD verbally expressed never having participated in a health-focused research study or group health educations classes, especially while at work. The previously discussed markedly low scoring of HRPre45 and HRPost45 supports the CTD verbal reports. The significant number of the population willing to physically return onsite or complete the posttest HPLP II questionnaire by phone demonstrates that this type of education and measurement was feasible and applicable to the population. As discussed, the excluded number of CTDs who were unreachable by phone was much lower than expected. However, no driver declined to participate when telephone contact was successful. Drivers expressed poor daily physical activity, and the physical activity domain of the HPLP II questionnaire was reported as the lowest. Despite this, a significant

positive change was still reported in physical activity after the education session on the second HPLP II. Even the markedly low responses showed some degree of improvement. The posttest means of all three domains showed improved lifestyle behaviors two weeks after the education session.

Inferences About the Findings

The data results of this study align closely with the primary concepts of Pender's middle-range theory, the HPM. The HPM is built upon the premise of health promotion through education and primary prevention in both individuals and communities, as opposed to the singular treatment of a disease in one individual (Peterson & Bredow, 2017). The data results of the domains were consistent despite the sample having a 40 year age span and population variability of as much as 25 years' difference in professional driving experience. This study demonstrated a population sample of a much larger CTD community that shares similar needs, which is significant because "Pender suggests that interventions directed toward the family and community are most likely to be successful in creating a healthy society" (Peterson & Bredow, 2017, p. 229). The inference of study findings strongly supports the need for continued health education that is either encouraged and/or provided by transportation employers in partnership with nursing professionals. In addition, each FMCSA ME has independent opportunities in clinical practice to assess a CTD's health awareness, health status, offer improved resources, and provide education.

Implications of Analysis for Leaders

The implications of this study apply to occupational and public health professionals, FMCSA ME's, and transportation safety leaders. This study demonstrated that onsite group health education with a nursing professional utilizing campaign materials is beneficial to

influencing CTD lifestyle behaviors, even if the education is singular and isolated. It is significant to note that more research and interventions are necessary to further positively influence CTD habits and behaviors. This dramatic shift in culture will require a significant amount of national transportation leaders and industry buy-in to happen. The value of making health-promoting changes in the transportation workplace will have to be further studied and demonstrate a larger degree of change to justify cost and implementation. Transportation leaders will have to understand that group health education can improve the declining health of CTDs with innumerable benefits for the employer. This type of cultural change can begin now in North Texas with the partnerships of Company A and Company B. However, this industry's culture as well as federal and state regulations, ironically, move very slowly.

EBP Findings Related to DNP Essentials

The findings of this DNP study relate directly to the published American Association of Colleges of Nursing (AACN) DNP Essentials (2006). The eight DNP Essentials are elements that must be met in education programs for advanced practice registered nurses to attain DNP recognition (AACN, 2019). Clinical nurse research projects at the DNP level serve to prepare "nurse specialists at the highest level of advanced practice" (Chism, 2016, p. 6). The examination of the practice findings and inferences of this study related to the DNP Essentials (AACN, 2006) are as follows.

Essential I: Scientific underpinnings for practice. This study project aligns with Essential I. In many ways, the research of CTD education can provide both immediate and long-term improved health behaviors to affect scientific clinical findings. "Well-being and optimal function of human beings, sick or well; the patterning of human behavior in interaction with the environment in normal life events…the nursing actions or processes by which positive changes

in health status are affected" (AANC, 2006, p. 9). Clinical nurse leaders in practice must be proficient in identifying areas of needed investigation, institute original or utilize existing research for further investigation, and apply evidence-based practice as the scientific bases to improve individual and population health. The systematic development of this project included a comprehensive literature review to support the need to evaluate CTD health and lifestyle further. The utilization of Pender's HPM and the HPLP II tool had been demonstrated effective in previous population health research (Sharifirad et al., 2015; Tanjani, Azadbakht, Garmaroudi, Sahaf, & Fekrizadeh, 2016). Implementation of the study findings into clinical practice as an FMCSA ME was immediate and natural to clinical nursing practice. The dissemination of study findings in clinical communities to promote change in clinical practice will be a seamless process due to the thoroughness and professional expectations of this DNP program.

Essential II: Organizational and systems leadership for quality improvement and systems thinking. There are currently no health promotion groups or longstanding education programs offered to the CTDs of the company partners. There are also no education or wellness program opportunities within the preventive health benefits of either company-sponsored health insurance plans. The health dangers associated with a CTD career warrant a heightened focus on preventive health measures in this community and population. Measures should include education and health screening outside of the mandated FMCSA physical examinations. This research has shown with statistical significance that after health education, CTDs report making lifestyle improvements. An education study of this type had not been performed at either of these company sites before, and Company A related no prior participation in any research in the past. Presenting the findings of this study to panels at both company partners has the potential to be influential for positive change. Company B already utilizes online modalities for some aspects of

mandatory monthly safety meetings. The potential incorporation of health information meetings and health incentive plans could be implemented at both Company A and Company B, with onsite, online, and incentivized programs.

Clinically, the results of this study can positively affect the quality of care provided to CTDs in the following ways: (1) FMCSA ME better understanding the value of the time with a CTD can improve poor lifestyle habits, (2) through dissemination of study findings in the FMCSA community with both electronic and paper submission for publication in the *National Alliance: Medical Examiner Newsletter*, and (3) dissemination in education publications within the advanced practice nursing community, such as the required eight-hour FMCSA ME training program offered by the American Academy of Nurse Practitioners.

Essential III: Clinical scholarship and analytical methods for evidence-based practice. The strong statistical correlation of positive study findings relates directly to the reported lifestyle changes after health education was received. The validated results of data were acquired after analysis with the use of statistical techniques and the expertise of a research statistician. The findings were validated and supported the hypothesis and research question that guided this project. The findings of this study were significant, evidence-based, and implementable into clinical and occupational practice on several levels. The study identified a multitude of opportunities for continued evidence-based analytical research that include further study of the different ways to affect CTD lifestyle behaviors with online and onsite education more specific to transportation occupations, employer-led initiatives for health improvements, and improving education opportunities during the delivery of care by FMCSA ME.

Essential IV: Information systems/technology and patient care technology for the improvement and transformation of health care. Organization of a long-term employer,

insurance carrier, or healthcare system wellness programs specific to the needs of CTDs for health promotion is warranted. Along those lines, future wellness programs could encourage CTDs to utilize their primary care personal health record (PHR). Using a PHR application, either by a web-based platform or the accessibility of a fully functional smartphone application, is vital for improving population health and individuals' lives (Ford, Hesse, & Huerta, 2016). The ease and accessibility of a PHR, along with available education and portability, would be beneficial to CTDs. Utilizing a PHR is also appropriate for scheduling, requesting medication refills, and communicating directly with a health care provider.

Essential V: Health care policy for advocacy in health care. There are substantial gaps in the health information gathered from drivers and transportation leaders to support the current, as well as the needed, FMCSA regulations. Medical guidance and regulatory considerations for CTDs with chronic health conditions such as sleep apnea, diabetes, hypertension, and coronary artery disease are as much as 25 years old at this time (FMCSA, 2014a). The findings of the literature review supported the need for this study as well as the necessity for occupational health professionals to advocate for health improvement opportunities for CTDs. The baseline data for this study served to identify knowledge gaps and missed education opportunities in the level of care provided during the required health certification exams. My role is to present the findings of this study to professional organizations because, "Research can prompt practice changes and policy updates, and can challenge nursing premises and values" (Timmins, 2015, p. 34). Focusing on disseminating this study's information to organizations with a significant number of FMCSA ME advanced practice nurse members is the goal. These professional groups include the North Texas Nurse Practitioner Association, Texas Nurse Practitioner Association, and the North

Texas Association of Occupational Health Nurses, and the Texas State Association of Occupational Health Nurses.

Essential VI: Interprofessional collaboration for improving patient and population health outcomes. FMCSA ME health professionals must facilitate lines of open communication with CTDs to help identify knowledge needs. In addition to continued vigilance of potential health issues and negative effects of evolving unhealthy lifestyle behaviors, such as vaping, controlled substances for weight loss, insomnia, stress and mental health conditions, and narcotic pain medication therapy. Understanding industry demands through communication and partnerships with transportation safety professionals is necessary for occupational health medicine to understand what happens and what is expected of our clients outside of the clinic walls. Just as an individual is more than the sum of their parts, the role of a CTD is dynamic and different in every driving role. The health qualifications of an FMCSA CTD are standardized and must not be limited with any restriction. The FMCSA requires that a CTD should not be certified for only their current role because a current health certification will allow a CTD to move to a completely different driving position, often with different physical expectations (FMCSA, 2014a). As a continued presence onsite at transportation hubs and business offices during safety meetings or performing ergonomic assessments, an advanced practice nurse is a health expert and resource with unlimited potential to form professional relationships and trust with a CTD community.

Essential VII: Clinical prevention and population health for improving the nation's health. It is established that "Nursing has foundations in health promotion and risk reduction and is therefore positioned to have an impact on the health status of people in multiple settings" (Chism, 2016, p. 19). Population health is not a limited concept that separates people by race,

sex, or even age. A population with individual or more specific health needs can include a multitude of attributes and challenges. The four million strong CTDs working in the United States of America today is a distinct population (Bureau of Labor Statistics, 2015). Providing health care to this population can be challenging at times. A career as an FMCSA CTD is one of the few occupations that require health to be at a minimum level for public safety. In addition to maintaining the standard of health, these individuals are often away from home, sitting the majority of their workday or work night, often have poor access to adequate food storage and bathroom facilities, experience mentally stressful work, and also undertake strenuous physical labor when it is required. As a clinical expert and nurse practitioner, working within occupational health medicine and through the process of this study, it is clear that population health influenced the nation's state of health. The role of a DNP prepared clinician is also a positive change agent in population health.

Essential VIII: Advanced nursing practice. As clinical experts and leaders, advanced practice nurses also possess the unique ability to relate to individuals and families on a different level than physicians. In many instances, patients achieve higher health status and higher satisfaction with the care of advanced practice nurses when compared to physician counterparts (Stanik-Hutt et al., 2013). Advanced practice nurses are most often in an educator or information-giving role; to truly effect change and health promotion, an FMCSA ME and CTD partnership will be necessary to improve the health of this population (Hyde & Kautz, 2014). The findings of this study have weight to influence not only occupational health nurse practitioners but primary care and specialty service providers that interact with the CTD population as well.

Recommendations for CTD Education

Recommendation for onsite and online availability of education for CTD is necessary. Access to health professionals and CTD involvement in employer-supported healthy lifestyle programs that include education is warranted. Incorporating an advanced practice nurse FMCSA health professional into a transportation company to implement healthy lifestyle strategies and programs would be beneficial on a multitude of levels. Recommendations for the implementation of the numerous electronic resources and free evidence-based campaign material in the workplace are easily implementable for a positive change in CTD health and culture. Employer incentives to participate or sponsored enrollment for health“check-ins” using online programs such as Be Healthy Rewards, My Fitness Pal, and CalorieKing.com can provide CTDs with physical activity and food tracking modalities along with valuable nutrition and physical activity education that CTDs can utilize at their convenience. A recommendation for CTDs to seek out health education applicable to the unique CTD work environment includes SiriusXM channel 146: Road Dog Radio: Talk for Truckers that periodically features health information programs.

Recommendations for Future Research and Clinical Practice

It is recommended that effective dissemination of the information gained from this study be provided to FMCSA MEs to help facilitate CTD behavior changes through clinical education opportunities. Having printed health information on topics such as nutrition, weight control, the warning signs of cancer, safe physical activity recommendations, blood pressure control, risk factors for sleep apnea, and diabetes made available to CTDs at the time of certification examination is merited. Assisting FMCSA ME in understanding that CTDs are a unique and very large at-risk population who are often separated from family support and health care

professionals because of their occupation and that they require unique clinic support is warranted.

Further recommended research is the continued study of CTD learning opportunities and effective modalities of teaching health information. The evaluation of lifestyle behaviors in CTDs who have health insurance and participate in health promotion plans when compared to CTDs who do not have health insurance or the availability of promotion plans holds potential for future health promotion programs. Future clinical practice must include vigilance in the assessment of health trends affecting CTDs in the transportation industry. Dynamic and innovative measures will be needed to continue to educate this population, and evaluations of the effectiveness of those measures must occur to change clinical practice.

Chapter Summary

In conclusion, the goal of this study was to demonstrate that healthy lifestyle behaviors in nutrition, health responsibility, and physical activity can be improved in CTDs with group health education. The statistical analysis strongly supports that the reported positive change in lifestyle behaviors that occurred during this study are due to the educational intervention. Improving the behaviors and health of CTDs with education modalities presented at the job site can potentially produce immediate results; however, shifting the health trend in this population is going to require strong support from transportation industry leaders and health care professionals. Many factors contribute to the health of this population, and further investigation is required. This is a robust population that should not be neglected or overlooked by employers and health care providers simply because they are out diligently performing their jobs, especially when their job is contributing to health risk.

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Appendix A: Evidence-Based Literature Search

1.Citation Jacobson, P., Prawitz, A. D., & Lukaszuk, J. (2007). Long-haul truck drivers want healthful meal options at truck-stop restaurants. *Journal of the American Dietetic Association*, *107*(12), 2125–2129.	Purpose/Question A) Obese drivers place less importance on healthy choices than optimal weight drivers; B) Healthy food & attitudes will be positively correlated.	Design Non-experimental, Descriptive, cross sectional analysis	Sample Size 92	Independent Variables Weight, BMI, sex, and occupation	Dependent Variables Food choices
Results 92 total drivers; 79 of those were overweight & 52 measured as obese.	Strength 1) Designated as a pilot study,	Weakness 1) Small sample size, data collected two days at Midwest truck stop might have created bias. 2) Tanita scale in public might discourage participation.	Level of Evidence Level C	Statistical Test *t* tests & Pearson's r correlation; using SPSS 13.0 for the calculations	Clinical Outcomes No difference in food importance for either overweight/obese & optimal weight drivers; >concern about healthy food choices have more positive attitudes about restaurant options.
2.Citation Lemke, M., Apostolopoulos, Y., Hege, A., Wideman, L., & Sonmez, S. (2017). Work, sleep, cholesterol levels of U.S. long-haul truck drivers. *Industrial Health*, *55*(2), 149–161.	Purpose Question 1) Generate a cholesterol profile for U.S. LHTD 2) Determine the influence of work and organizational	Design Non-experimental, cross-sectional descriptive design	Sample Size 262 Mean age of 47.8yrs	Independent Variables Hours of sleep duration, sleep quality, driving miles per week	Dependent Variables HDL cholesterol LDL cholesterol Total cholesterol Continuous Variables Age/years of driving experience (mean 14.97 yrs.)
Results CTDs have a high-risk cholesterol profile, & sleep quality and work organization factors may induce these cholesterol outcomes.	Strength 1) An array of races recruited at a truck for six months. 2) Participants allowed to use aliases for greater confidentiality.	Weakness 1) non-work "good" vs."poor" workday sleep. 2) Small sample size, no females. 3) conditions that would limit driving certificate. 4) lab draw was a deterrent. 5) Limited fasting	AACN Level of Evidence Level C	Statistical Test Linear Regression; Ordinal Regression	Clinical Outcomes 1) Ave 6.92 hrs. of sleep nightly. 2) 35.7% with rare/never having "quality" workday sleep. 3) *Overall cholesterol profile was poor, supports hypothesis* 4) Driving >11hrs.=increased or high risk of CMD.
3.Citation Mansur et al. (2015). Risk factors for cardiovascular disease, metabolic syndrome & sleepiness in drivers. *Arquivos Brasileiros de Cardiologia*, *105*(6), 560–565.	Purpose Question Analyze the relationship between obesity & metabolic syndrome with sleepiness in drivers.	Design A non-experimental, cross-sectional study collecting data from 148 roadside stops by highway police	Sample 2,228 male	Independent Variables: DM, drug/alcohol use, high chol & triglycerides, abdominal circumference	Dependent Variables Sleepiness
Results 1) Mean age 43.1 yrs 2) 2006-2011 showed increased neck & abdominal size; increased total & triglyceride cholesterol; and increased sleepiness.	Strength 1) Large population. 2) Point of care lab testing provided participants with results and education materials quickly.	Weakness 1) Analysis based on the percent of yearly grouped variable vs using individual subject data 2) All male	Level of Evidence Level C	Statistical Test Linear Multiple Regression analysis	Clinical Outcomes 1) Increased sleepiness & metabolic syndrome. 2) Increased abdominal girth & HTN associated with drowsiness.

4.Citation Marqueze, E., Ulhôa, M. A., &Moreno, C. (2013). Effects of irregular-shift work & physical activity, CVD factors in truck drivers. *Revista de Saúde Pública*, *47*(3), 497–505.	Purpose Question Analyze shift type and leisure-time physical activity on CVD factors in truck drivers.	Design A non-experimental, cross-sectional study	Sample Size 57 male truck drivers	Independent Variables Types and times of shift work and hours of recreational activities	Dependent Variables Reported perception of health, social support, and work stress level.
Results: High SBP & DBP; >typical measurements, high total cholesterol; no difference in sedentary workers & irregular shift workers. Higher CVD risk with irregular shift	Strength Equal day shift & irregular shift workers/overnight drivers. 2) comprehensive, CVD lab for quantitative data.	Weakness 1) All male subjects. 2) A low number of participants in the study, even including the excluded drivers.	Level of Evidence Level C	Statistical Test *t*-test comparison	Clinical Outcomes Irregular-shift at higher risk of obesity; day workers also have long working hrs & this could lead to problems with inadequate diet and a sedentary lifestyle.
5. Citation Thiese et al. (2015). Commercial driver medical examinations: Prev of obesity, comorbidities, certification outcomes. *Journal of Occ & Environmental Medicine*, *57*(6), 659–665.	Purpose Question Assess the relationship between BMI & comorbid conditions within a large sample of truck drivers.	Design Non-experimental, cross-sectional Design	Sample Size 88,246	Independent Variables Weight by BMI categories, age, sex	Dependent Variables Length of health certification after examination; the number of medical diagnosis & comorbidities
Results 1) 53.3% obese with >30 BMI & 26.6% were morbidly obese with >35 BMI. 2) Morbid obesity increased by 8.9% & the presence of 3 or more conditions fourfold from 2005 to 2015.	Strength 1) Length of study for data over time, with multiple certs for each driver; a database of >88,000 with nationwide representation.	Weakness More initial exam results recorded because of the turnover or changing employer in this industry.	Level of Evidence Level C	Statistical Test SAS 9.3 Fisher exact, Kruskal-Wallis, and Barnard tests	Clinical Outcomes Overweight, obese & morbid obese had shorter health cert. & injury/illness in <5 yr., heart disease & heart surgery, HTN, DM, pain & nervous disorders.

Appendix B: Pender Permission for Health Promotion Model and HPLP II Tool

Dear Rhonda:

You have our permission to use the Health Promotion Model in your work as well as the HPLP II. Please see the attachment for multiple sources of information related to the HPM and instruments.

Nola Pender

On Wed, Sep 20, 2017 at 10:45 AM, Bell, Ronda

Good Morning Dr. Pender-

I hope this email finds you doing well. I am a practicing Family Nurse Practitioner in [redacted] and a DNP student at Abilene Christian University, also here in Texas. I am developing a Capstone project to promote better health in cargo truck drivers. I would very much like to utilize the Health Promotion Model as well as Dr. Walker's Lifestyle Profiles. I would very much like to have contact with you and any suggestions for reaching Dr Walker would be greatly appreciated. I certainly do NOT want to interrupt your retirement. I very much appreciate your theory and your work. Again, I hope this finds you well. My cell
blessed week and I appreciate your time-

Appendix C: Walker Permission for Health-Promoting Lifestyle Profile II

University of Nebraska Medical Center

COLLEGE OF NURSING
Community-Based Health Department

[redacted]

Dear Colleague:

Thank you for your interest in the *Health-Promoting Lifestyle Profile II*. The original *Health-Promoting Lifestyle Profile* became available in 1987 and has been used extensively since that time. Based on our own experience and feedback from multiple users, it was revised to more accurately reflect current literature and practice and to achieve balance among the subscales. The *Health-Promoting Lifestyle Profile II* continues to measure health-promoting behavior, conceptualized as a multidimensional pattern of self-initiated actions and perceptions that serve to maintain or enhance the level of wellness, self-actualization and fulfillment of the individual. The 52-item summated behavior rating scale employs a 4-point response format to measure the frequency of self-reported health-promoting behaviors in the domains of health responsibility, physical activity, nutrition, spiritual growth, interpersonal relations and stress management. It is appropriate for use in research within the framework of the Health Promotion Model (Pender, 1987), as well as for a variety of other purposes.

The development and psychometric evaluation of the English and Spanish language versions of the original instrument have been reported in:

Walker, S. N., Sechrist, K. R., & Pender, N. J. (1987). The Health-Promoting Lifestyle Profile: Development and psychometric characteristics. Nursing Research, 36(2), 76-81.

Walker, S. N., Volkan, K., Sechrist, K. R., & Pender, N. J. (1988). Health-promoting lifestyles of older adults: Comparisons with young and middle-aged adults, correlates and patterns. Advances in Nursing Science, 11(1), 76-90.

Walker, S. N., Kerr, M. J., Pender, N. J., & Sechrist, K. R. (1990). A Spanish language version of the Health-Promoting Lifestyle Profile. Nursing Research, 39(5), 268-273.

A copy of the instrument (English and Spanish versions), scoring instructions, an abstract of the psychometric findings, and a list of publications reporting research using all versions of the instrument are available for download.

Sincerely,

Susan Noble Walker, EdD, RN, FAAN
Professor Emeritus

Appendix D: Health-Promoting Lifestyles Profile II

Subsections Health Responsibility, Physical Activity, and Nutrition

19-057

Lifestyle Profile II- Subsections: Health Responsibility, Activity & Nurtition

Directions: This questionaire contains statements about your *pesent* way of life or personal habits.
Please respond to each item as accurately as possible, and try not to skip any item.
Indicate the frequency with which you engage in each behavior by circling:

N for never **S for sometimes** **O for often** **R for routinely**

	Never	Sometimes	Often	Routinely
Choose a diet low in fat, saturated fat, and cholesterol.	N	S	O	R
Report any unusual signs or symptoms to a physician or other health professional.	N	S	O	R
Follow a planned exercise program.	N	S	O	R
Limit use of sugars and food containing sugar (sweets).	N	S	O	R
Read or watch TV programs about improving health.	N	S	O	R
Exercise vigorously for 20 min or more at least three times a week (such as brisk walking, bicycling, aerobic dancing, using a stair climber).	N	S	O	R
Eat 6-11 servongs of bread, cereal, rice, and pasta each day.	N	S	O	R
Question health professionals in order to undertand their instructions	N	S	O	R
Take part In light to moderate physical activity (such as sustained walking 30-40 min 5 or more times a week).	N	S	O	R
Eat 2-4 servings of fruit each day.	N	S	O	R
Get a second opinion when I question my health care provider's advice	N	S	O	R

pg. 2	Never	Sometimes	Often	Routinely
Take part in leisure-time (recreational) physical activities (such as swimming, dancing, bicycling)	N	S	O	R
Eat 3-5 servings of vegetables each day.	N	S	O	R
Discuss my health concerns with health professionals	N	S	O	R
Do stretching exercises at least 3 times per week.	N	S	O	R
Eat 2-3 servings milk, yogurt, or cheese each day.	N	S	O	R
Inspect my body at least monthly for physical changes/danger signs.	N	S	O	R
Get exercise during usual daily activities (such as walking during lunch, using staris instead of elevators, parking car away from destination and walking).	N	S	O	R
Eat only 2-3 servings of meat, poultry, fish, dried beans, eggs, and nuts each day.	N	S	O	R
Ask for information from health professionals about how to take good care of myself.	N	S	O	R
Check my pulse rate when exercising.	N	S	O	R
Read labels to identify nutrients, fats, and sodium content in packaged food.	N	S	O	R
Attend educational programs on personal health care.	N	S	O	R
Reach my target heart rate when exercising.	N	S	O	R
Eat breakfast.	N	S	O	R
Seak guidance or counseling when necessary.	N	S	O	R

Appendix E: IRB Approval Letter

ABILENE CHRISTIAN UNIVERSITY
Educating Students for Christian Service and Leadership Throughout the World

Office of Research and Sponsored Programs
320 Hardin Administration Building, ACU Box 29103, Abilene, Texas 79699-9103
325-674-2885

June 20, 2019

Ronda Bell

Department of Nursing

Abilene Christian University

Dear Ronda,

On behalf of the Institutional Review Board, I am pleased to inform you that your project titled "Increasing Healthy Lifestyle Behaviors in Transportation Drivers",

was approved by expedited review (Category 7) on 6/20/2019 (IRB # 19-057). Upon completion of this study, please submit the Inactivation Request Form within 30 days of study completion.

If you wish to make any changes to this study, including but not limited to changes in study personnel, number of participants recruited, changes to the consent form or process, and/or changes in overall methodology, please complete the Study Amendment Request Form.

If any problems develop with the study, including any unanticipated events that may change the risk profile of your study or if there were any unapproved changes in your protocol, please inform the Office of Research and Sponsored Programs and the IRB promptly using the Unanticipated Events/Noncompliance Form.

I wish you well with your work.

Sincerely,

Megan Roth

Megan Roth, Ph.D.
Director of Research and Sponsored Programs

Appendix F: Company A Agreement Letter

SITE AUTHORIZATION/COOPERATION ACKNOWLEDGEMENT

Date- 4-19-19

To whom it may concern:

Please note that Ms. Ronda Bell, Nurse Practitioner and nursing student doctoral candidate from Abilene Christian University, has the permission to conduct a study project with transportation drivers. The project, **"Increasing Healthy Lifestyle Behaviors in Cargo Drivers"** will occur and be conducted on site in the community at our facility.

Ms. Bell will recruit voluntary drivers by presenting the opportunity to attend a 30 minute education session and complete a health survey questionnaire about lifestyle behaviors to collect data. The drivers will also be asked to complete a simple demographic information sheet.

A follow up survey will also be completed by the drivers two weeks later, either on-site/by phone or email with the driver's permission.

Ms. Bell's on-site study activities will begin after Abilene Christian University grants IRB approval of this education project. Ms. Bell has agreed to conduct this study with the understanding that industry and driver work flow changes periodically throughout the year. Ms. Bell has provided her contact information for any questions in regards to the study.

Ms. Bell has agreed to protect all driver data that is collected and remove patient identification by assigning a random number identifier to each driver.

Ms. Bell has agreed to not interfere with the work day flow of our employees or vehicles and abide by all safety rules and regulations while on site.

Participation in this study project will have no effect on a driver's employment. As the employer, we will only receive the benefit of helping our drivers achieve healthier lifestyle behaviors from allowing Ms. Bell to conduct this education study on site.

If there are any questions, please contact my office.

Signed,

[redacted]

Appendix G: Company B Agreement Letter

SITE AUTHORIZATION/COOPERATION ACKNOWLEDGEMENT

[redacted]

Date- 4/18/2019
To whom it may concern:

Please note that Ms. Ronda Bell, Nurse Practitioner and nursing student doctoral candidate from Abilene Christian University, has the permission of [redacted] to conduct a study project with [redacted] transportation drivers. The project, "Increasing Healthy Lifestyle Behaviors in Cargo Drivers" will occur and be conducted on site in a classroom at the Haslet facility.

Ms. Bell will recruit voluntary drivers by approaching with the opportunity to attend an education session and complete a survey questionnaire about lifestyle behaviors to collect data. A follow up survey will also be completed by the drivers two weeks later, either on site or by phone or email with the driver's permission. Ms. Bell's on-site study activities will begin after Abilene Christian University grants IRB approval of this project. Ms. Bell has agreed to conduct this study with the understanding that industry and driver work flow changes periodically throughout the year. Ms. Bell has provided her contact information for any questions in regards to the study.

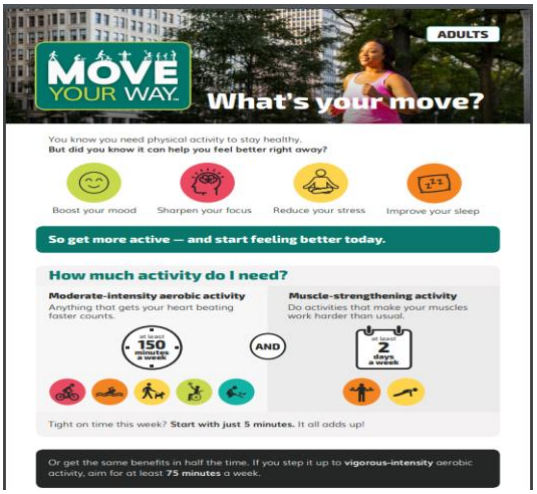
Ms. Bell has agreed to protect all driver data collected and remove patient identification by assigning a random number identifier to each driver. Ms. Bell has agreed to not interfere with the work day flow of our employees or vehicles. Participation in this study project will have no effect on a driver's employment. [redacted] will only receive the benefit of helping our drivers achieve healthier lifestyle behaviors from allowing Ms. Bell to conduct this study on site.

If there are any questions, please contact my office.

Signed,

[redacted]

Appendix H: Move Your Way



Source:

United States Department of Health and Human Services. (2018). *Move your way: Campaign material*. Washington, DC: Office of Disease Prevention and Health Promotion, Health.gov. Retrieved from https://health.gov/our-work/physical-activity/move-your-way-campaign

Appendix I: Study Inactivation

ACU IRB # 19-057 Date of Inactivation 12/4/2019

Abilene Christian University Institutional Review Board Committee

Inactivation Request Form

*Complete the Request and send as an e-mail attachment to orsp@acu.edu. Include any appendix materials, as applicable, and a **new signed** Investigator assurance/signature form.*

Allow up to 8 weeks for the requests to be processed. Many members of the committee are unavailable to review proposals during the summer and holiday months. Submission during the fall or spring term is highly recommended.

Title of Project: **Increasing Healthy Lifestyle Behaviors in Transportation Drivers**
Protocol #: **19-057** Date of Request: **3/27/2019**

Principal Investigator: **Ronda Bell**

Faculty Advisor (If PI is a student): **Dr. Sharisse Hebert**

****Note: Faculty Advisor MUST read and sign the Investigator Assurances Form**

Department / Affiliation: **Nursing** Degree/Credentials: **DNP**

Phone: [redacted] Email: [redacted]

ACU Box:

Point of Contact, if other than PI (Name, phone, email):

Section I. Changes

1. Were any changes made since the last review? ☐ Yes **x No**

If yes, were they all previously approved by the IRB? ☐ Yes ☐ No

Please summarize the approved changes that were made:

Date of Amendment: Summary of Change:

Date of Amendment: Summary of Change:

Date of Amendment: Summary of Change:

2. Were any unapproved deviations reported to the IRB as noncompliance?
☐ Yes ☒ No ☐ N/A Explain: (If no and the deviation is serious, please include an Unanticipated Problems/Noncompliance Report. Serious is defined as adversely affecting participant safety, increasing risks to participants, or violating participants' rights and welfare)

Section II. Eligibility & Enrollment

1. Please confirm the following are true (or not applicable to this study):

True ☒ N/A ☐ Enrollment is permanently closed
True ☒ N/A ☐ Data or specimens no longer being collected
True ☒ N/A ☐ Research assessments, procedures, or treatments are no longer being performed
True ☒ N/A ☐ Federal funding for human research on this protocol has ended
True ☒ N/A ☐ If this is the lead site in a multi-center study, all other sites have closed the study
True ☒ N/A ☐ Data analysis is complete or involves only de-identified data

2.

Participant Enrollment	
How many participants:	
Were originally approved for screening	**150**
And for enrollment	**100**
were screened	**71**
were enrolled	**57**
completed participation	**57**
withdrew/were withdrawn	**14**

Please provide a description of each withdrawal, including who initiated the withdrawal (e.g., participant or PI) and why (e.g., adverse event, non-compliance, no longer met eligibility criteria, etc.):

No longer met eligibility criteria, unable to contact to complete the last questionnaire for data collection.

3. Was consent obtained for all enrolled participants, as described in the initial protocol?
☒ Yes ☐ No ☐ N/A Explain:

4. Did all participants receive a copy of the signed consent form? ☒ Yes ☐ No ☐ N/A
Explain:

Section III. Progress

Please summarize the progress on the study: **Statistical analysis is complete and preparing for final defense of the project at this time.**

Section IV. Problems

1. Have any problems occurred? ☐ Yes ☒ No If yes, please summarize:
Were these previously reported to the IRB? ☐ Yes ☐ No Explain: n/a
Were any of these problems unanticipated and probably related to the research?
☐ Yes ☐ No ☒ N/A Explain:

Were any of these problems serious or did they suggest a greater level of risk than originally anticipated? ☐ Yes ☒ No ☐ N/A Explain:

Did the occurrence of any of these problems require a revision of the consent form?
☐ Yes ☐ No ☒ N/A Explain:

2. Have any participants made any complaints about the study? ☐ Yes ☒ No Explain:

3. Is there any new information that needs to be communicated to the participants? ☐ Yes ☒ No ☐ N/A If yes, summarize and explain how this will be done (include communications/templates in the appendix, as appropriate):

Section IV. Funding

Did this study **at any point** receive any external funding? ☒ No ☐ Yes

If Yes, please list the funding agency and describe the funding:

Section V. Assurances

As part of study closure, the **Faculty Investigator (PI or Faculty Advisor)** assures that (**must check ALL**):

☒ Inactivation of this study means that the IRB approval to conduct research has ended
☒ The **Faculty Investigator (PI or Faculty Advisor)** is responsible for secure storage of data and records according to policies on retention.
☒ Identifiable data from this study may not be used in other research without prior IRB approval.

APPENDIX

Identify which items are included in the submission (Please submit all documents as **SEPARATE** attachments)

☒ Signed Investigator assurance/signature form (**new form required**)

☐ Participant Communications

☐ Unanticipated Problems/Noncompliance Report Form

☐ Other: _____

For Administrative Purposes Only:

Data Destruction Date: 12/4/2022