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Theresa L. Free
*Southern Adventist University*

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# A Mixed Methods Evaluation of an Intensive Therapeutic Lifestyle Change Program for Nurses with Obesity

Theresa L. Free

School of Nursing, Southern Adventist University

NURS 825-A: Scholarly Project Evaluation

Dr. Frances Johnson

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## Chapter One: Introduction of the Problem and Purpose

This scholarly project investigated the problem of obesity in nurses and provided an evaluation of a nurse-practitioner led intensive therapeutic lifestyle change (ITLC) program that used an evidence-based Lifestyle Medicine approach for the treatment of obesity in nurses. An emergent explanatory sequential three-phase mixed methods design was used to 1) conduct a pilot program for nurses with obesity and evaluate pre- and post-biometric data, 2) evaluate the pre- and post-program biometric data for previous program participants, and 3) follow up with in-depth interviews to understand the participants' experiences of the program. Chapter One covers the background and significance of the proposed project, the clinical question, the theoretical framework to be utilized to guide the project, and the discussion of key concepts and terms.

### Background and Significance of the Clinical Problem

Obesity has become a worldwide pandemic, now affecting more than 650 million adults and contributing to over four million deaths each year around the world (World Health Organization [WHO], 2020). In the United States, the age-adjusted prevalence of obesity reached an all-time high of 42.4% in 2017-2018, which continues to show a significantly increasing trend (Hales et al., 2020). Obesity is associated with many serious health risks including the leading cause of death in the United States, heart disease.

One might think that because of their higher level of health literacy that nurses might be less impacted by this preventable illness. Kyle et al. (2017) found that nurses in England had no significant difference in prevalence rates than individuals in non-healthcare related occupations. They found that the prevalence of obesity in nurses in England was 25% or one in every four

nurses. Zitkus (2011) showed a prevalence rate in American nurses to be 27%, slightly higher than the English nurses.

Hruby et al. (2016), in reviewing the key findings of the Nurses' Health Study (NHS) and Nurses' Health Study II (NHS II), identified many consequences of obesity. Findings indicate that excess body weight, even within normal Body Mass Index (BMI) ranges, negatively impacts morbidity and mortality. They found that excess weight and weight gain are risk factors for type two diabetes, hypertension, heart disease, ischemic stroke, overall cancer risk, post-menopausal breast cancer, large adenocarcinoma of the distal colon, as well as endometrial, kidney, and pancreatic cancers. Other related conditions were gallstones, infertility, asthma, cataracts, and psoriasis. They also found that being overweight or gaining weight also decreases levels of physical functioning and vitality and increases body pain. It also diminishes the chances of successful aging, which was defined as "being free of major chronic conditions and having no significant cognitive, physical, or mental limitations at age 70" (Hruby et al., 2016, p. 1660).

## Specific Aims/Purpose

This scholarly project allowed the Project Leader to incorporate the knowledge accumulated during two years of intensive study of the subject of Lifestyle Medicine into a clinical program to address a problem she had experienced and overcome using this approach. The business entity Be Free Lifestyle Medicine was established to support the translation of research into practice. Within this context, this project was designed to address the issue of obesity in nurses in alignment with the Six Aims for Healthcare Improvement (Institute of Medicine [IOM], 2001). It was designed to provide a safe, effective, patient-centered, timely, efficient, and equitable program for nurses with obesity (IOM, 2001). Furthermore, the overall purpose of the project was to evaluate the effectiveness of a nurse practitioner-led live online

ITLC program that used an evidence-based Lifestyle Medicine approach for the treatment of obesity in nurses.

## Problem Statement with Objectives/Hypothesis

The problem of obesity in nursing is quite distinct, presenting unique problems, challenges, situations, and opportunities. In addition to the increased morbidity and mortality that impacts all patients affected by this condition, there are several problems unique to this population due to their impact on the healthcare system. When nurses become ill or injured, they not only become patients, adding to the patient burden, but are also unable to fulfill their role in the healthcare system, thus affecting the capacity of the healthcare workforce. In other words, they not only become part of the problem, but they also are less able to function as part of the solution.

Nurses also play a large role in health promotion, in this case, promoting healthy body weight. Studies show that healthcare professionals' lifestyle behaviors influence how frequently they provide health advice. For example, in a systematic review, Fie et al. (2013) found that doctors and nurses with higher personal activity levels and those with positive attitudes toward physical activity were more likely to promote physical activity to their patients. In another systematic review, doctors and nurses of normal weight were more likely to give advice to prevent obesity and to advise patients with obesity on how to achieve weight loss (Zhu et al., 2011). Thus, nurses who are a normal weight and practice healthy lifestyle behaviors may be more effective at health promotion than those who are not.

Based on the aforementioned realities of nurses' health, the problem statement for this project is as follows: Obesity affects approximately 25-30% of American nurses, which increases morbidity and mortality, negatively impacts the capacity of the healthcare workforce, and

decreases their ability to effectively provide health promotion information to the patients and communities they serve (Kyle et al., 2017; Zitkus, 2011). To decrease obesity in nurses, safe, effective, patient-centered, timely, efficient, and equitable, evidence-based programs must be made available.

## Clinical Question

The clinical question is outlined using the PICOT format. PICOT is a mnemonic used to describe the population, intervention, comparison, outcome, and timeframe for the research project. The PICOT question for this Scholarly Project was as follows: How does evaluation of quantitative biometric data and qualitative data regarding individual experiences combine to provide improved understanding of the effectiveness of an online eight-week, nurse practitioner-led Lifestyle Medicine Intensive Therapeutic Lifestyle Change (ITLC) Program for weight loss in nurses who are overweight or obese?

### *P: Population of Interest*

The population of interest is nurses who are overweight or obese. The intervention specifically focused on registered nurses (RNs) with a BMI equal to or greater than 25. To fully evaluate the effectiveness of the ITLC program, participants from two previous eight-week programs held by this Project Leader were also included in this project.

### *I: Intervention*

The intervention utilized for this Scholarly Project was a pilot nurse practitioner-led online ITLC program that used an evidence-based Lifestyle Medicine approach to achieve the goal of weight loss. The ITLC program consisted of eight weekly live online small group sessions. The program was designed to include both education and social support.

### *C: Comparison of Interest*

First, because the focus was on achieving weight loss for nurses with obesity, a pilot program was conducted to determine if statistically significant weight loss could be achieved by nurses participating in a pilot program as evidenced by pre- and post-intervention BMI. Waist circumference, blood pressure, fasting serum glucose, and lipid levels were also analyzed for this group. Second, pre- and post-intervention BMI data from previous program participants were also used to further evaluate the effectiveness of the program. Finally, a qualitative strand, using the interpretive description approach, was incorporated to better understand the effectiveness of the program from the perspective of the participants.

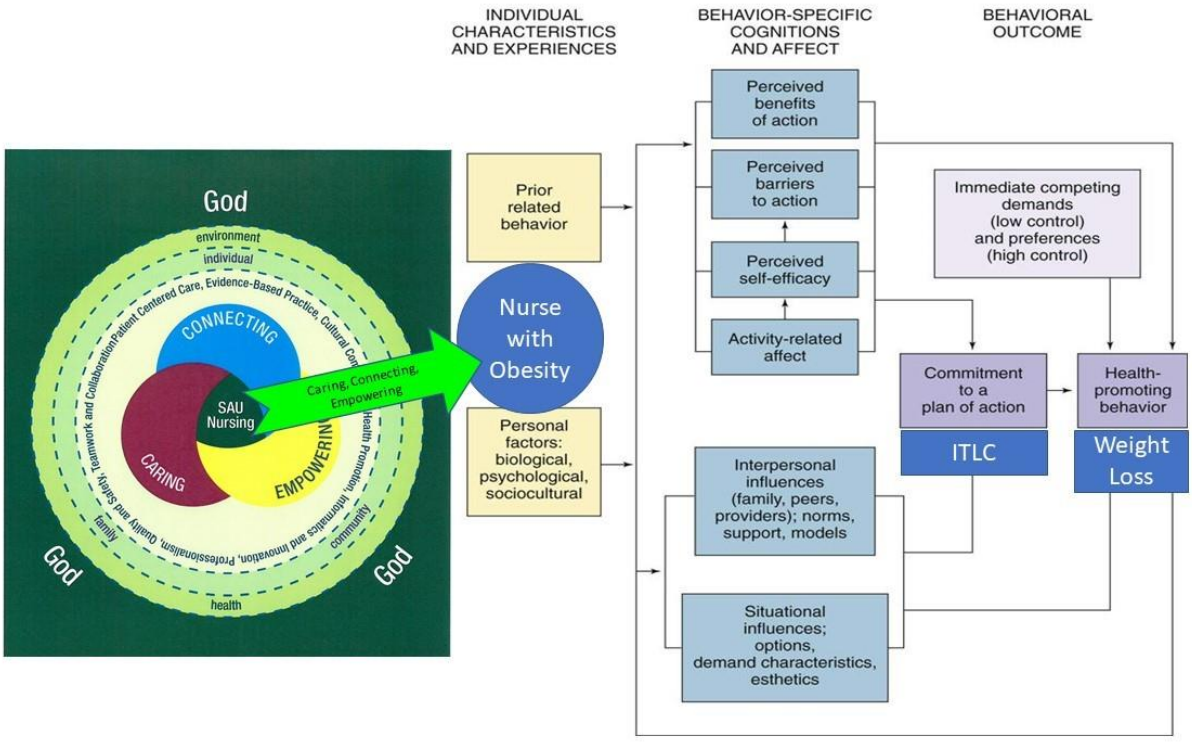
### *O: Outcome of Interest*

The primary outcome of interest for the effectiveness of the program was a change in pre- and post-program BMI. This outcome was analyzed both in the pilot ITLC program for nurses, or the Pure Group, as well as for all participants from all programs combined, the Combined Group. Secondary outcomes considered in the evaluation of the ITLC program were changes in waist circumference (WC), systolic blood pressure (SBP), diastolic blood pressure (DBP), fasting glucose (GLU), total cholesterol (TC), low-density lipoprotein (LDL), high-density lipoprotein (HDL), and triglycerides (TRIG). These measurements were fully available in the Pure Group. The Combined Group contained only partial records and they were used when the data were available.

To further enhance the understanding of the effectiveness of the program, the experience of program participants was also explored qualitatively using the interpretive description method under the guidance of the theoretical framework: a combination of the Nola Pender Health Promotion Model and the Adventist Framework for Nursing (see Figure 1).

**Figure 1**

*Theoretical Framework Integrating the Adventist Framework for Nursing with the Nola Pender Health Promotion Model*




*Note.* This model shows the integration of the Adventist Framework for Nursing on the left. The green arrow represents the Southern Adventist University (SAU) prepared nurse caring for, connecting with, and empowering the patient: the nurse with obesity. On the right the Nola Pender Health Promotion Model is depicted. It includes the individual characteristics and experiences, behavior-specific cognitions and affect, and behavioral outcomes shown. All of these factors influence a nurse's ability to commit to a plan of action, the ITLC program, which in turn leads to health promoting behaviors and to the ultimate desired outcome: weight loss.

### *T: Timeframe*

Prior to the pilot program, two iterations of the ITLC program were conducted. They were both held in person at Cedar Avenue Integrative Medicine for eight consecutive weeks beginning on January 20, 2020 and July 29, 2020. The pilot program, designed specifically for nurses with obesity, began on October 27, 2020.

At the conclusion of the pilot program, it was determined that further research was required for a comprehensive evaluation of the project. The initial quantitative study evolved into a three-phase mixed methods design. After a period of planning for the redesign, the second quantitative phase consisting of the collection of previous program participants' data ensued. This quantitative phase was followed by the qualitative phase.

## Objectives

The overarching objective of this scholarly project was to evaluate the effectiveness of an ITLC program for nurses with obesity. This program has been developed for nurses by nurses who have experienced obesity and successfully lost weight. It was the hope of this Project Leader to bring the culmination of what was learned during the doctoral program emphasizing Lifestyle Medicine and what was known in the scientific literature to clinical practice to improve patient outcomes. By disseminating this information to other nurses, the Project Leader sought to help nurses lose any excess weight that they wished to lose, thus improving both their individual health as well as the health of the healthcare workforce. It was also hoped the nurses would also take the information learned during the program and share it with their patients. In this way, the project may indirectly enhance health promotion in the community. The detailed objectives of the project are discussed in Chapter Three.

## Hypothesis

As this project was a program evaluation design, it operated under the following hypothesis: “The nurse practitioner-led ITLC program is an effective weight loss program for overweight and obese nurses.” The project focused on assessing the effectiveness of the ITLC program.

## Theoretical Framework

The primary theoretical framework for this Scholarly Project is Nola Pender’s Health Promotion Model. This model looks at individual characteristics and experiences, as well as behavior-specific thoughts and emotions that can impact behavioral outcomes. Some of these factors include the perceived benefits of action, the perceived barriers to action, the perceived self-efficacy of the individual, and the activity related affect (Petiprin, 2016). All these factors, as well as interpersonal situational influences, affect a person's ability to commit to a plan of action that, when implemented, leads to health-promoting behaviors.

The Adventist Framework for Nursing was also incorporated. It includes the concepts of caring, connecting, and empowering (Southern Adventist University School of Nursing, 2019). The concept of caring is one of the foundational principles of the profession of nursing. According to a study of nursing faculty, caring is the most common description of the culture of nursing (Strouse & Nickerson, 2016). It was essential that the program had a foundation of caring, providing the opportunity for connection among participants and empowering them to take control of their health by assisting them in achieving their ideal weight. Thus, Nola Pender’s Health Promotion Model, combined with the Adventist Framework, provided a balanced approach that took into account a patient-centered behavioral focus as well as a practitioner-led

ethical focus. These two models were combined to provide the framework used to guide and organize this project (see Figure 1).

In addition, to better understand the individual experiences of the participants, the interpretive description method was used. Interpretive description, an expanded form of qualitative description, goes "beyond mere description and into the domain of the 'so what' that drives all applied disciplines" (Thorne, 2008). It does not have a prescribed method but rather draws from various research methods. Interpretive description will be discussed in more detail in Chapter Two. For the qualitative portion of this study some aspects of the Parse Method were also incorporated including dialogic engagement, extraction-synthesis, and heuristic interpretation (Polit & Beck, 2017).

Dialogic engagement is described as "true presence of the researcher with the participant" (Parse, 2010, p. 298). The idea of true presence is described by Parse (1998) as "a free flowing attentiveness" (p. 71). The Project Leader interpreted this to mean listening attentively and being with the participant in the sharing of the experience. This form of engagement with participants is not an interview per se but is intended to allow the participant to freely express what it was like to experience the event of interest.

Extraction-synthesis is described as "all-at-once dwelling with and inventing" (Parse, 2010, p. 298). This is a process of dwelling with the information and extracting the key concepts. Heuristic Interpretation is "weaving the structure" (Parse, 2010, p. 298). In this phase of this method, after dwelling with the information and extracting key concepts the information is then woven into a higher level of understanding through abstraction. Heuristic interpretation includes "structural transposition, conceptual integration, metaphorical emergings, and artistic expression" (Polit & Beck, 2017, p. 473).

## Concepts and Definition of Terms

### Overweight and Obesity

According to the WHO (2020), overweight and obesity are defined as "abnormal or excessive fat accumulation that presents a risk to health" (para. 1). Overweight specifically is defined as a BMI greater than or equal to 25.0 kilograms per meters squared ($kg/m^2$). Obesity specifically is defined as a BMI greater than or equal to 30.0 $kg/m^2$.

### Lifestyle Medicine

According to the American College of Lifestyle Medicine (2019d), Lifestyle Medicine is defined as:

> The use of evidence-based lifestyle therapeutic intervention—including a whole-food, plant-predominant eating pattern, regular physical activity, restorative sleep, stress management, avoidance of risky substances, and positive social connection—as a primary modality, delivered by clinicians trained and certified in this specialty, to prevent, treat, and often reverse chronic disease. (para. 1)

### Intensive Therapeutic Lifestyle Change Program

Mechley and Dysinger (2015) proposed that ITLCs be defined as programs that meet four criteria. The first is that they are evidence-based and use approaches shown to work using accepted research methods. Second, they are multimodal in that they use multiple modes of addressing lifestyle change including factors such as nutrition, physical activity, stress management, and social support. Third, they include multiple sessions (from eight to 20 sessions) lasting at least 60 minutes per session, occurring at least weekly during a period of no less than ten days. Finally, specific health outcome metrics are measured, and consistent results are obtained and account for variability in populations, adherence, and engagement.

# Chapter Two: Literature Review

To best investigate the problem of obesity in nurses, as well as evaluate the effectiveness of the ITLC for weight loss, it is important to first understand what is already known about the problem and its current treatment. Chapter Two will provide a review of the relevant literature on obesity in nurses including the risk factors for developing obesity and its consequences, usual care, and the use of ITLC programs for the treatment of obesity. A synthesis of the current literature, as well as identified gaps, is presented.

## Search Methodology

Quantitative and qualitative studies, as well as systematic reviews and clinical guidelines, were reviewed to find the best available evidence to support the need for this Scholarly Project. An online search was conducted using EBSCO, which included CINAHL Complete, MEDLINE Complete, Rehabilitation and Sports Medicine Source, and SPORTDiscus. Clinical Key and Therapeutic Research Center Natural Medicines databases were also included in the search. Key search terms included the following: obesity, nurse, nursing, body mass index, weight control, weight loss, weight gain, and lifestyle. The search was limited to literature in English. No limits in time frame were placed on the search to capture the full scope of research on these topics.

## Evidence

### Definition of the Problem: Obesity in Nurses

In a quantitative study, Kyle et al. (2017), sought to identify the prevalence of obesity among English nurses as compared to other healthcare professionals such as doctors, dentists, pharmacists, and therapy professionals, unregistered care workers such as nursing assistants, and workers in non-healthcare related occupations. Findings indicate the prevalence of obesity in nurses was 25.1% (95% CI, 20.9% to 29.4%), other healthcare professionals 14.4% (95% CI,

11.0% to 17.8%), unregistered care workers 31.9% (95% CI, 28.4% to 35.3%), and workers in non-health related occupations 23.5% (95% CI, 22.9% to 24.1%). Using logistic regression to adjust for sociodemographic composition and year of the study, they found that, compared with nurses, the odds of being obese were significantly lower for other healthcare professionals (aOR=0.52, 95% CI, 0.37 to 0.75) and higher for unregistered care workers (aOR=1.46, 95% CI, 1.11 to 1.93). There was no significant difference in obesity prevalence between nurses and those who work in non-health-related occupations (aOR 0.94, 95% CI, 0.74 to 1.18).

Zitkus (2011) studied 721 RNs in the United States. Nurses were advanced practice registered nurses (APRNs) recruited from a national conference, randomly selected members of Sigma Theta Tau International Honor Society of Nursing, and RNs who were taking their bachelor's degree, and bachelor's/master's program graduates from a school of nursing in the Greater New York area. Findings were that 57% of nurses were either overweight (30%) or obese (27%). This study indicates that the prevalence of obese nurses in the United States may be even higher than Kyle et al. (2017) found in England.

Another study conducted by Krussig et al. (2012) found that 29.48% of nurses were obese in a sample of 485 RNs working at a regional hospital in South Carolina. Obesity rates at the time in South Carolina were reported to be ninth highest in the nation, and likely overestimate national obesity rates for nurses.

Qualitative research has been done that focuses on the experience of weight loss. In a synthesis of qualitative research, Garip and Yardley (2011) identified twelve themes that describe factors involved in weight management: "health concerns, expectations toward weight management, attributions for weight gain, psychological barriers, psychological facilitators, self-perception and body image, stigmatization, socio-cultural factors, environmental barriers,

environmental facilitators, experiences with weight management programmes and positive outcomes of programme participation" (p. 110).

In trying to better understand the experience of nurses with obesity, Harding (2020) conducted a qualitative study to explain how nurses who are obese manage their weight and factors that were influential to this process. They found that nurses desire to lose weight and change eating habits but were unable to balance their needs with the demands of patients and other workplace demands. They report that this may be due to self-sacrifice, which has long been an issue in nursing. The nurses in this study also avoided providing counseling to patients on the topic of weight loss if they were struggling with their weight, but felt empowered to do so when they were losing weight.

**Risk Factors and Consequences of Obesity**

Hruby et al. (2016) performed a review of the Nurses' Health Study (NHS) and Nurses' Health Study II (NHS II) and presented the contributions these studies have made to the scientific understanding of obesity risk factors and consequences. NHS and NHS II are large, well-designed cohort studies of nurses, conducted from 1976 to the present, that have collected medical and lifestyle data for nurses. Dietary and lifestyle factors that contribute to the risk of obesity are consumption of sugar-sweetened beverages, poor diet quality, physical inactivity, prolonged screen time, short sleep duration or shift work, and environmental exposures to known endocrine disruptors, termed "obesogens," such as bisphenol A and phthalates (Holtcamp, 2012). Bisphenol A and some forms of phthalates are known to be associated with metabolic syndrome; a cluster of risk factors that includes abdominal obesity. Wilding et al. (2009), in a study of 20 doctors and nurses, reported that at least 24 chemicals were found in each participant and two

had as many as 39 chemicals detected. All the participants in the study were found to have bisphenol A and some form of phthalates.

Hruby et al. (2016) also found that while genetic factors can predispose people to obesity, this susceptibility can be attenuated, in all cases, by adopting healthy lifestyle behaviors. While adult weight gain is still predictive of poor outcomes, weight loss of > 5 kilograms (kg) [11 pounds (lbs.)] after age 18 was associated with nearly 50% lower risk. Overall, these studies show the importance of maintaining a normal weight, or of losing excess weight if overweight or obese, through healthy dietary and lifestyle behaviors.

**Clinical Practice Guidelines for the Management of Obesity**

Two clinical practice guidelines were in place for the management of obesity in adults prior to 2016. The first, *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults,* was published by the National Heart, Lung, and Blood Institute and the National Institute of Diabetes and Digestive and Kidney Diseases in 1998. Later guidelines were developed by the National Institute for Health and Care Excellence (2014), *Managing Overweight and Obesity in Adults- Lifestyle Weight Management Services* (Jensen et al., 2014). Despite these well-established practice guidelines, Barnes et al. (2015) found that obesity is often undiagnosed and not treated according to the guidelines in primary care practices. In addition, efforts to improve adherence among providers was not effective.

*American Association of Clinical Endocrinologists and American College of Endocrinology (AACE/ACE) Comprehensive Clinical Practice Guidelines for Medical Care of Patients with Obesity* came out in 2016 (Garvey et al., 2016). This robust document includes evidence-based recommendations for all aspects of the clinical care of patients with obesity. The three modalities used in the treatment of obesity are lifestyle interventions, pharmacology, and

procedures. Throughout the guidelines, the importance of lifestyle therapy is emphasized. One of the recommendations, R64, is that a structured lifestyle intervention program for weight loss, which consists of a healthy meal plan, physical activity, and behavioral interventions, should be made available to patients who are overweight or obese (Garvey et al., 2016).

**Weight Loss by Usual Care**

Wadden et al. (2011) performed a two-year randomized trial to study obesity treatment in primary care practice. Patients were randomized to one of three groups: usual care, brief lifestyle counseling, or enhanced brief lifestyle counseling. Usual care was described as quarterly visits to the primary care provider (PCP) to address coexisting illnesses. At each visit, the PCP spent about five to seven minutes reviewing the participant's weight change and information was provided in handouts. The brief lifestyle counseling group in year one had two 10-15-minute counseling sessions with a medical assistant life coach and in year two they were permitted to complete counseling visits by telephone every other month. The third group, in addition to the same PCP and brief lifestyle counseling visits also received their choice of sibutramine, orlistat, or meal replacements. Of 390 participants, those undergoing usual care lost 1.7 ± 0.7 kg (3.7 ± 1.5 lbs.) at 24 months, the brief lifestyle intervention group lost 2.9 ± 0.7 kg (6.4 ± 1.5 lbs.), and the enhanced lifestyle intervention group lost 4.6 ± 0.7 kg (10.1 ± 1.5 lbs.).

Fildes et al. (2015) looked at the probability of an obese person achieving a normal weight. They studied 75,704 obese men and 99,791 obese women in the United Kingdom excluding patients who had bariatric surgery. In nine years of follow-up, 1,283 men and 2,245 women attained a normal weight. The annual probability of attaining a normal weight was calculated to be one in 210 for men and one in 124 for women, increasing to one in 1,290 for men with morbid obesity and one in 677 for women with morbid obesity. Of the patients that

achieved 5% weight loss, 50% regained it within two years. They concluded that the probability of attaining normal weight is low and that current obesity treatment strategies fail to achieve sustained weight loss for most obese patients.

**Intensive Therapeutic Lifestyle Change Programs**

Intensive Therapeutic Lifestyle Change (ITLC) programs, such as the Ornish Program and Complete Health Improvement Program, are structured lifestyle intervention programs designed to treat lifestyle-related chronic illnesses. Ornish et al. (1998) did the first randomized control trial, the Lifestyle Heart Trial, to determine if a comprehensive lifestyle change program could motivate people to make and sustain lifestyle changes and whether doing so would arrest or reverse atherosclerosis. They found that, in an experimental group of patients with coronary atherosclerosis who participated in a comprehensive lifestyle change program, 71% (20 of 28) of patients completed the program and made and maintained the recommended lifestyle changes at the five-year follow-up compared with 75% (15 of 20) of the control group who completed the five-year follow-up and made more moderate changes. This addressed one of the major questions regarding treatment using lifestyle changes; “will patients do it?”. They found that nearly the same percentage of people made the recommended changes in the intervention group as those who made more moderate changes in the control group.

Ornish et al. (1998) also investigated changes in arterial stenosis. In the experimental group, the average percent diameter stenosis decreased 1.75 absolute percentage points after one year and 3.1 absolute percentage points after five years compared to the control group which showed an increase of 2.3 percentage points after one year and 11.8 percentage points after five years. While the experimental group showed more regression at five years than at one year, atherosclerosis in the control group continued to progress. The control group also had twice as

many cardiac events during the five-year follow-up. They also found that the experimental group lost 10.9 kg (23.9 lbs.) at one year and sustained a weight loss of 5.8 kg (12.8 lbs.) at five years while the weight in the control group showed little weight change from baseline.

Other ITLCs have been developed that demonstrate effective results in treating a variety of chronic illnesses such as diabetes. The Complete Health Improvement Program (CHIP) is one such program. The CHIP program is an ITLC consisting of 18 sessions typically given over 6-9 weeks. Morton et al. (2016) present an analytical review of this program's 34-year history and the more than 25 peer-reviewed publications that have been conducted studying its clinical and cost effectiveness. The aggregate data show that participants lost 3.3 kg (7.3 lbs.) during the program. They conclude that whether delivered in clinical, corporate, or community settings that CHIP programs demonstrate short-term and long-term clinical benefits including significant improvements in all biometrics and are shown to be a cost-effective approach to treating a variety of chronic diseases.

Chang et al. (2012) found, in a qualitative study of CHIP participants in Australia, reported benefits of improved diet and exercise and weight loss. While benefits were reported, not all participants found the lifestyle recommendations easy to adopt, and some encountered resistance from within themselves or from friends and family. The authors offer a model of change process developed from the perspectives of the participants of this study.

## Gaps in the Evidence

While the risks of developing obesity and the associated consequences are widely understood, gaps continue to exist as to how to effectively treat this condition in the general population and, more specifically, in the population of nurses. While clinical guidelines recommend a structured lifestyle intervention program for weight loss be made available to

patients who are overweight or obese, and ITLC programs provide an effective model, no research is available regarding the use of these programs for nurses. There is also little known about the lived experiences of nurses who participate in weight loss programs. This project seeks to provide an understanding of nurses' experiences in participating in a weight loss program, thus adding to the body of knowledge that can inform the development of weight loss programs for nurses.

## Synthesis of the Literature

In summary, research indicates about 25 to 30 percent of nurses in the United States are obese. Nurses, despite their increased health literacy, have no statistically significant difference in the rate of obesity than workers in non-healthcare related occupations. Thanks, in large part, to large cohort studies such as the Nurses' Health Studies, there is a solid literature base regarding the risk factors for developing obesity as well as its consequences in nurses (Hruby et al., 2016). It is also well known that healthy dietary and lifestyle behaviors are key to maintaining a healthy weight.

While clinical practice guidelines exist for the management of obesity, the literature indicates that usual care in primary care practice does little to correct the problem. ITLC programs have shown promise in the arrest and reversal of many chronic conditions including reductions in body mass index. The results of the Lifestyle Heart Trial, for example, found that the weight loss exhibited by the experimental group [10.9 kg (23.9 lbs.) at one year and sustained a weight loss of 5.8 kg (12.8 lbs.) at five years] exceeded the results found by Wadden et al. (2011) in all arms of the study [usual care group lost 1.7 ± 0.7 kg (3.7 ± 1.5 lbs.) at 24 months, the brief lifestyle intervention group lost 2.9 ± 0.7 kg (6.4 ± 1.5 lbs.), and the enhanced lifestyle intervention group lost 4.6 ± 0.7 kg (10.1 ± 1.5 lbs.)] (Ornish et al., 1998). This research

indicates that ITLC programs have the potential to exceed the weight loss results shown by usual care or even the brief and enhanced lifestyle interventions offered in this study.

The qualitative research that focuses on the topic of weight loss has identified some key themes involved in weight management. Available knowledge indicates nurses desire to lose weight, but have a difficult time balancing their own needs with the needs of others, thus leading to potentially self-sacrificing behaviors. This research suggests that a successful ITLC program for nurses could incorporate what is currently known into the program and could address these issues.

In summary, there is a strong body of evidence to illustrate the risks of developing obesity and the resulting consequences including the increased risk of type two diabetes, cardiovascular disease, certain types of cancer, and premature death. While the clinical practice guidelines include making structured lifestyle intervention programs available for all people who are overweight or obese, little research exists regarding how such programs can be tailored to meet the unique needs of nurses.

# Chapter Three: Methodology

As previously established, the problem of obesity in nurses is a complex issue requiring careful study in the development of best practices for weight loss treatment programs. This scholarly project addresses the assessment of a nurse practitioner-led online ITLC program for weight loss through a three-pronged research approach utilizing both quantitative and qualitative measures. Chapter Three provides the evidence-based project description, objectives, population plan, instrumentation, procedure with intervention, Institutional Review Board process, strategic analysis, and data evaluation plan for this inquiry.

## Evidence-Based Project Description

Based on the literature review, the evidence-based intervention was an eight-week, nurse-practitioner-led live online ITLC program in a private practice setting as a weight loss measure for nurses who are overweight and obese.

### Purpose

The purpose of this project was to evaluate the effectiveness of a nurse-practitioner-led online ITLC program that used an evidence-based Lifestyle Medicine approach for the treatment of obesity in nurses.

### Objectives

#### *Phase One*

1) To conduct a pilot program eight-week live online ITLC program for obese nurses with the goal of improving BMI in overweight and obese nurses through a program that provides education and support.
2) To evaluate the effectiveness of the pilot ITLC program as evidenced by changes in the primary outcome of interest: pre- and post-intervention BMI.

3) To evaluate the effectiveness of the pilot ITLC program as evidenced by changes in secondary outcomes of interest: pre- and post-intervention waist circumference (WC), systolic blood pressure (SBP), diastolic blood pressure (DBP), total cholesterol (TC), low-density lipoprotein (LDL), high-density lipoprotein (HDL), fasting glucose (GLU), and triglycerides (TRIG) for pilot program participants.
4) To determine estimates of means, standard deviations (*SD*), and effect size of biometric changes to help determine sample size calculations needed for future studies.

***Phase Two***

1) To evaluate the effectiveness of the ITLC program as evidenced by changes in the primary outcome of interest: pre- and post-intervention BMI in the Combined Group.
2) To evaluate the effectiveness of the ITLC program as evidenced by changes in secondary outcomes of interest: pre- and post-intervention WC, SBP, DBP, TC, LDL, HDL, GLU, and TRIG for the Combined Group.

***Phase Three***

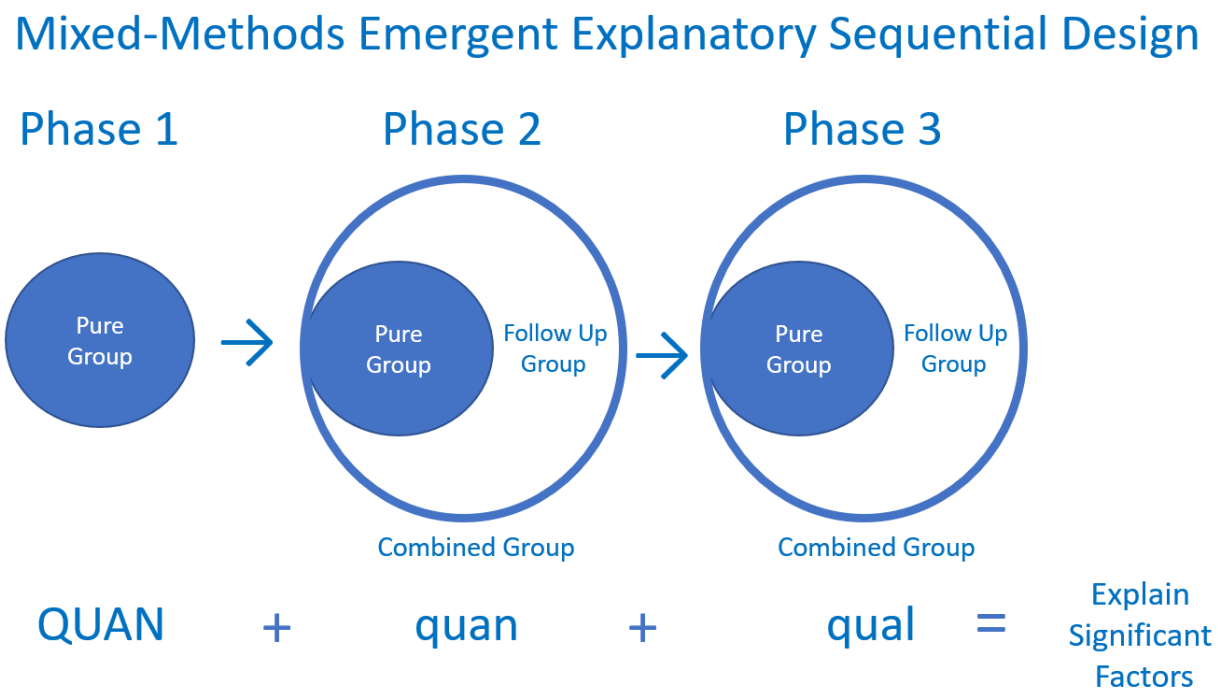
1) To conduct in-depth interviews with program participants to obtain a deeper understanding of the program participants' experience of the program using an interpretive description approach within the context of the Nola Pender Health Promotion Model and the Adventist Framework for Nursing.

**Design**

The design of this Scholarly Project is a program evaluation design. An explanatory three-phase mixed methods design (QUAN→ quan →qual) was used in which quantitative data were collected first and additional quantitative and qualitative data were then added to explain these results in more depth (see Figure 2).

**Figure 2**

*Mixed Methods Emergent Explanatory Sequential Design*




The initial intent of the investigation was to run a pilot eight-week ITLC program to improve BMI in obese nurses. The initial quantitative strand consisted of analysis of pre- and post-intervention biometric data for the pilot program participants, referred to as the Pure Group. Due to the small sample size of the Pure Group, a mixed-methods design emerged that involved adding two additional phases. The second quantitative phase was then added in which biometric data were collected for participants of previous iterations of the same program, the Follow Up Group. Quantitative analysis also took place using the combination of data from the Pure Group and the Follow Up Group (i.e., the Combined Group). A third qualitative phase was then added which involved in-depth interviews with eight participants to obtain a deeper understanding of the participants' experience of the program and to identify the significant factors that helped to

explain the results found in the first two phases. Interviews and subsequent analysis were completed using the process of interpretive description (Thorne et al., 2004).

Interpretive description is a qualitative approach that was developed in the field of nursing to study clinical phenomena for the purpose of identifying themes and patterns in subjective experiences and developing an interpretive account that can inform understanding in the clinical setting (Thorne et al., 2004). This approach operates within the lens of a chosen theoretical framework and seeks to bring new understanding that can be applied directly to clinical practice (Polit & Beck, 2017).

According to Burdine et al. (2021), interpretive description allows for the enhancement of evidence-based observations through analysis of participants' experiences, thus offering a way to generate an in-depth understanding and inform best-practice initiatives. This approach is designed to produce an understandable conceptual description that identifies common themes and allows for individual variations and has the potential for future application (Thorne et al., 2004). Interpretive description can also help to inform clinical reasoning and enhance quality care. Ultimately, the goal is to understand a phenomenon in a clinically meaningful way. Table 1 provides further detail regarding the procedures and products of each phase.

**Table 1**

*Mixed Methods Study Design*

| Phase | Procedure | Product |
|---|---|---|
| **Phase 1 -Quan**<br>**Quantitative data collection of pilot program participants,** ***Pure Group*** | • Pre- and Post-Intervention Biometrics (N=4) | • Numeric data |
| **Quantitative Data Analysis** | • Wilcoxon Signed Rank Test with 3 matched pairs<br>• R statistical analysis software | • Descriptive statistics |
| **Phase 2- quan**<br>**Quantitative data collection of previous program participants** ***Follow Up Group*** | • Pre- and Post-program biometric data collected from medical records review (N=4) | • Numeric data |
| **Qualitative data analysis of Pure Group and *Combined Group (Pure Group + Follow Up Group)*** | • Wilcoxon Signed Rank Test with 7 matched pairs<br>• R statistical analysis software | • Descriptive statistics |
| **Case Selection; Interview Guide Development** | • Recruitment of participants for qualitative phase (N=8)<br>• Developing interview questions | • Participants (*N*= 8)<br>• Interview Guide |
| **Phase 3 - qual**<br>**Qualitative Data Collection** | • Individual in-depth telephone interviews with eight participants | • Text data from notes taken during interview |
| **Qualitative Data Analysis** | • Coding and thematic analysis | • Key concepts/themes<br>• Table of multiple case analysis |
| **Integration of the Quantitative and Qualitative Results** | • Interpretation of quantitative and qualitative results | • Clinical Implications<br>• Future Research |

## Sample/Target Population

### Participants

For the pilot program in Phase One, the target population was obese registered nurses working in Washington and Oregon states where the Project Leader is licensed to practice. The goal was to recruit six to 12 participants to allow for individual attention and social interaction in a small group setting. Phase Two incorporated individuals who were prior participants of ITLC programs held in January and July of 2020. Since previous ITLC programs did not limit

participation to nurses, Phase Two included individuals from other professions. Phase Three combined all participants from Phase One and Phase Two.

**Recruitment**

In Phase One, nurses were recruited using the snowball method through an email and Facebook marketing campaign, as well as by word of mouth and with flyers. Email and Facebook solicitations, as well as flyers, were distributed through the social networks of the Project Leader. For Phase Two and Phase Three, the Project Leader contacted prior program participants by email and invited them to participate by agreeing to have their pre- and post-intervention data included in the study and by agreeing to participate in an in-depth interview.

**Inclusion and Exclusion Criteria**

In Phase One, Individuals were eligible to participate if they were registered nurses living in the states of Washington or Oregon and if they were overweight (i.e., with a BMI greater than or equal to 25 $kg/m^2$) or obese (i.e., with a BMI greater than or equal to 30 $kg/m^2$). They also were required to have access to a computer with internet access to attend online meetings. For Phase Two and Three the only eligibility requirement was that they had participated in an ITLC program in 2020.

In Phase One, participants were excluded from participation if they did not meet these eligibility requirements, had a diagnosis of anorexia nervosa or bulimia, had a history of bariatric surgery, or were undergoing another weight loss program. For Phase Two and Three, there were no additional exclusion criteria.

**Protection of Human Subjects**

This Scholarly Project was approved by the Institutional Review Board at Southern Adventist University to ensure the protection of participants. The privacy and confidentiality of

participants were maintained. Steps taken to protect privacy and confidentiality included coding of the participants using identification numbers. A master list was created and maintained by the Project Leader in a password-protected file on a password-protected computer in a locked building. Protected health information was stored securely within the Athena Health electronic medical records (EMR) system of Be Free Lifestyle Medicine LLC in strict adherence to HIPPA rules and regulations.

**Risks and Benefits**

Minimal risks were identified for participants in this study. These included a minor risk of anxiety or emotional distress when participating in a small group setting, physical exam, lab draw, or interview. The harm and risk did not exceed that normally encountered in everyday life or during routine clinical interventions. To decrease the impact of these risks, participants could skip any activity or questions they did not feel comfortable answering and could stop participation at any time. While every effort was made to protect confidentiality and protected health information, there was a chance that this information could have been accidentally released.

Potential benefits to participants included learning how to lose weight and keep it off using an evidence-based Lifestyle Medicine approach and connecting with other nurses who shared similar challenges and interests. A potential benefit to others was the possible improvement of the Lifestyle Medicine ITLC program to help nurses with obesity. The potential benefits of weight loss and diet and lifestyle education were believed to outweigh the minor risks involved in participating in the eight-week program.

## Instruments and Measures

To measure the outcomes of this project, biometric data were collected before and after the pilot ITLC program. Measures included height, weight, waist circumference (WC), systolic blood pressure (SBP), diastolic blood pressure (DBP), total cholesterol (TC), low-density lipoprotein (LDL), high-density lipoprotein (HDL), fasting glucose (GLU), and triglycerides (TRIG). Appointments were scheduled in the clinic with the Project Leader to collect biometric data during the two weeks preceding and following the program. In Phase Two, biometric data were analyzed from participants of previous programs.

In addition to biometric data, surveys were also used to collect feedback from the Pure Group during the pilot program. Two surveys were developed using Survey Monkey. The first was a post-session survey completed after each session. This was intended to collect feedback regarding each specific module. The second was a post-program survey that was designed to collect feedback from participants regarding the program in its entirety.

In Phase Three, qualitative data from in-depth interviews were analyzed using an interpretive description approach. An interview guide was created to elicit information about the participants' experience before, during, and after the program (see Appendix A). This guide provided questions regarding diet and lifestyle, as well as thoughts, feelings, and experiences of the participants.

## Procedure

### Institutional Review Board Approval

Approval was obtained from the Southern Adventist University Institutional Review Board (SAU IRB; see Appendix B). Consent forms that included the risks and benefits of participation were signed by participants prior to the initiation of the program. A second

approval was obtained from the SAU IRB for Phases Two and Three (see Appendix C). A second consent form was obtained from participants who participated in previous programs and who agreed to have their data used for the purposes of this project and to participate in the quantitative strand of the study.

**Statement of Mutual Agreement with the Cooperating Agency**

This project was conducted in the private solo practice of Be Free Lifestyle Medicine LLC and as a contracted provider of Cedar Avenue Integrative Medicine LLC (CAIM). The owner of CAIM LLC, Dr. Theresa Martez ND, agreed with the plan for this project. CAIM provided clinic space, medical supplies, and web hosting. They also assisted in the social media marketing campaign.

**Setting**

The program took place at Be Free Lifestyle Medicine LLC, a solo Lifestyle Medicine practice. Be Free Lifestyle Medicine contracts with CAIM for clinic space in Snohomish, Washington. This program was originally developed for a small group in-person setting, but with recent changes imposed by social distancing guidelines, the program was adapted and offered in an online meeting room. The schedule and instructions for accessing the online meeting room were emailed to participants.

**Necessary Resources**

This program was led by the Project Leader who also provided all the necessary resources including all educational materials and subscription to the electronic medical record and the video conferencing room.

### *Technology*

The technology used for this program included online conferencing, electronic medical records, and software for the management of study data. A subscription for a Health Insurance Patient Portability Act (HIPPA) compliant video conferencing product, Zoom, was purchased for this project. Athena Health EMRs were used to document participant health information obtained during pre- and post-intervention assessments. The software package, R, was used for the quantitative statistical analysis by a professional statistician (R Core Team, 2020).

### *Budget*

This program was designed to be offered at a modest cost for nurses and low overhead for the clinic. Most ITLC programs range in price from $500 to $700 per participant for a 12 to 16-week course. This ITLC program was developed by the Project Leader in part to keep down the costs for participants. While the CHIP program has significant evidence-based results to support its use, the cost of the program materials is $350 per participant. Facilitator fees are then added to the base price, resulting in a cost of about $600 for an 18-session program, usually offered as one-hour bi-weekly sessions for the first six weeks and weekly sessions for the following six weeks. This ITLC program was being offered as a 90-minute class once weekly for eight weeks. There were no materials for the participants to purchase and the cost of the class was $345, which covered the facilitator fees and expenses. The cost of the program was waived for the pilot project. Participants were responsible for the costs of their lab work. Direct costs of this program for the clinic included the cost of the video conference room. Indirect costs included leasing of clinic space and services, malpractice and general liability insurance for the Project Leader, the cost of maintaining the EMR, and the time involved in research and development of the program.

## Strategic Analysis of Project Feasibility

The need for effective weight loss programs is unquestionable as obesity has become a global pandemic. The need for this type of program to support nurses with obesity has also been substantiated. Group classes are one of the services offered by Be Free Lifestyle Medicine LLC. This is a low-volume low-overhead clinic, so the operational and financial plan is to be able to keep overhead as low as possible in order to offer excellent quality services for reasonable prices.

### *Feasibility and Sustainability*

This ITLC program was developed by the Project Leader in part to keep participation costs low when compared to other privately-offered programs. Survey information was also collected from participants to ascertain the perceived value of the program.

### *SWOT Analysis*

A strengths, weaknesses, opportunities, and threats (SWOT) approach was used as a strategic analysis tool for this project. Project strengths included the education and personal and professional experience of the Project Leader, including 22 years of professional nursing experience with five years as a nurse practitioner. The past eight years have been dedicated to the study and application of the principles of Lifestyle Medicine. This Project Leader has used these principles to lose 100 pounds and reverse obesity and hypertension, and is enthusiastic about helping others to do the same.

Project weaknesses included very little funding to provide materials such as the Complete Health Improvement Program (CHIP) or Ornish Program. The marketing of a new, unknown, and untested program was also challenging.

Project opportunities included the lack of similar programs in the area and none that specifically addressed the population of nurses. This ITLC program also had the benefit of being developed by a nurse who has struggled with obesity, which is believed to offer a perspective on the subject that is unique to this program. Unlike the CHIP program, this program specifically addressed the issue of food addiction and limited the use of visual food cues, which can cause cravings in people who are susceptible to food addiction. With the recent changes imposed by social distancing guidelines, having the ability to meet in online meeting rooms also allowed the opportunity for nurses to attend from the comfort and safety of their own homes.

Threats included the challenges related to the COVID-19 pandemic. The first COVID case, Patient Number One, was identified in January 2020, in Everett, Washington, where the Project Leader and program participants live. The hospital, Providence Everett Medical Center Everett, the largest employer of nurses in the county, was one of the first impacted by the pandemic. Threats from the pandemic also included diminished participant interest and ability to participate during this very challenging time.

**Project Description**

This project was initially broken down into three main phases; pre-intervention, intervention, and post-intervention. The pre-intervention phase included the development of the ITLC program in a format suitable for online delivery, recruitment of participants, and obtaining pre-intervention biometric data from participants. The timeline of the pre-intervention phase began with the research of the Scholarly Project in January 2020 and continued through the initial implementation of the intervention.

The first intervention phase included delivery of the eight-week ITLC program that began on October 27, 2020. The pilot program was delivered on Tuesday evenings from 7:30 to 9:00

PM Pacific Standard Time. It was conducted live online in a virtual video conference room for eight consecutive weeks.

The initial post-intervention phase involved the collection of post-intervention biometric data and analysis of outcomes. Post-intervention biometric data were obtained between December 7 and 14, 2020. On December 8, 2020, it was determined that, due to the limited size of the Pure Group, additional information would be needed to properly evaluate the effectiveness of the ITLC program. It was at this point that the project was redeveloped using a mixed methods design that included Phases Two and Three.

The second quantitative phase involved contacting the Follow-up Group participants and obtaining consent to use their pre- and post-program data for the purposes of the project. The third phase included conducting in-depth interviews of the Combined Group participants and occurred between January 15 and January 29, 2021.

The final post-implementation phase began following the conclusion of the three-phase implementation and concluded with a review of the results and a presentation to faculty and students at Southern Adventist University on April 26, 2021.

### *Intervention*

The intervention was an eight-week ITLC program that used an evidence-based Lifestyle Medicine approach. The agenda for each session followed a similar schedule. It included a welcome and introduction of the topic for about ten minutes. This was followed by a 20-minute period of participant sharing to facilitate group connection. A 30-minute presentation was then delivered on the session topic. The presentation was followed by another 20-minute period of sharing and an opportunity for participants to develop weekly specific, measurable, actionable,

realistic, and time-bound (SMART) goals regarding the development of healthy lifestyle habits. The last 10 minutes of the class were used to recap and answer any final questions.

The ITLC program consisted of eight sessions. The educational content of each session was as follows:

1) Session One was an introduction to Lifestyle Medicine and the six pillars of the Lifestyle Medicine approach: healthful eating based on a predominantly whole-food plant-based diet, physical activity, sleep, stress management, avoiding risky substances, and forming and maintaining relationships (American College of Lifestyle Medicine, 2019d). It began with teaching on the first pillar, healthful eating, and introduced the evidence for a predominantly whole-food plant-based diet. Because diet is the leading cause of death in the United States and the third leading risk factor of disability-adjusted life years (DALYs), it was the first pillar addressed in this program (Mokdad et al., 2018). Research shows that people who eat plant-based diets have lower BMI (Tonstad et al., 2013; Bradbury et al., 2014). Eating more whole plant foods increases the dietary factors that are known to improve human health such as fiber, phytochemicals, and antioxidants and reduces those that are known to be harmful such as refined carbohydrates, saturated fats, heme iron, and inflammatory compounds such as trimethylamine N-oxide (TMAO), N-Glycolylneuraminic acid (Neu5Gc), and endotoxins (Davis, 2019). Participants were encouraged to adopt a plant-based diet for the duration of the program.
2) Session Two continued the pillar of healthful eating and introduced the neuroscience related to food addiction and the avoidance of risky substances. The

effects of exposure to highly pleasurable substances on the brain are explained including the down-regulation of dopamine receptors in the nucleus accumbens, which can cause long-lasting neurologic changes with long-term use (U.S. Department of Health and Human Services, Office of the Surgeon General, 2016). The addiction potential of hyperpalatable foods is discussed including their ability to trigger cravings and cause compulsive overuse in the face of severe negative consequences. Evidence of chronic relapse and inability to reduce consumption was also mentioned (Gearhardt et al., 2011). The most addictive foods are highly processed and contain sugar and flour (Schulte et al., 2015). Participants were encouraged to abstain from foods containing sugar and flour for the duration of the program.

3) Session Three focused on the science of insulin resistance and the use of a low-fat whole-food plant-based diet to reverse the signs and symptoms of insulin resistance. In this session, teaching was provided regarding the pathophysiology of insulin resistance including the cause, which is the accumulation of excess fat in tissues that are not supposed to store large amounts of fat (Lionetti et al., 2009). The research in support of a low-fat whole-food plant-based diet for the treatment of insulin resistance was presented. Research clearly shows that a diet consisting of legumes, whole grains, fruits, vegetables, nuts, and seeds, as well as limiting processed foods and animal products is indicated for reducing insulin resistance and preventing and treating type two diabetes (McMacken & Shah, 2017). The biomarkers of insulin resistance were reviewed including elevated blood pressure, BMI, lipids, A1c, and fasting blood glucose levels. These biomarkers were

measured before and after the program to examine the effects of the recommended low-fat whole food plant-based diet on insulin resistance.

4) Session Four addressed the science of habits. Making lifestyle changes is about changing habits, so it is important to have a good understanding of how old habits can be eliminated and new ones formed. The science of habit formation and elimination was reviewed. Implementation intentions, for example, are an effective tool for successfully incorporating new healthy eating and exercise habits into one's daily routine (Michie et al., 2009). Tips for incorporating new healthy routines was discussed.
5) Session Five focused on stress management. This is a particularly important topic for nurses as the profession of nursing comes with a wide range of physical, emotional, and moral stressors (Nayomi, 2016). The pathophysiology of the effects of stress hormones, particularly cortisol was reviewed. The research regarding the link between stress and obesity was also reviewed, which does indicate an association between psychosocial stress and weight gain (Wardle et al., 2011). The long-known link between a high carbohydrate diet and lower cortisol levels was also reviewed (Anderson et al., 1987). Lifestyle approaches to stress reduction were discussed including self-management tips recommended by the American College of Lifestyle Medicine (American College of Lifestyle Medicine, 2019c).
6) Session Six explained the importance of improving sleep. During this session, the research regarding the effects of sleep on weight was reviewed. As nurses often work variable shifts and getting good sleep can be particularly challenging. Shift

work can result in circadian rhythm disturbances, which can result in the development of a variety of disorders including abdominal obesity (Mohd Azmi, 2020). Even if nurses do not do shift work, sleep short duration can also contribute to obesity (Wu et al., 2014). Lifestyle approaches to improving sleep are discussed (American College of Lifestyle Medicine, 2019b).

7) Session Seven discussed the pillar of physical activity. Physical activity is an important aspect of any Lifestyle Medicine program. For obesity, however, there are special considerations. The research regarding the impact of physical activity on weight loss were reviewed. It might come as a surprise to nurses that increasing physical activity is not an effective strategy for weight loss (Fock & Khoo, 2013). Most studies also show that there is no benefit to exercise in the maintenance of weight loss (Foright et al., 2018). Lifestyle approaches as to when and how to incorporate physical activity into a weight loss program were discussed.
8) Session Eight was the final session and addressed the pillar of connection and relationships. Part of the reason for having an ITLC program is to promote social connections with others who have similar challenges. Research shows that social support group attendance can improve health. For example, Schulz et al. (2008) found that social support group attendance improved blood pressure, health behaviors, and health-related quality of life in patients participating in a multicenter lifestyle demonstration project. Lifestyle approaches to making and strengthening social connections were discussed (American College of Lifestyle

Medicine, 2019a). In this final session, there was also a review and sharing of what was learned and a celebration of successes experienced during the program.

### *Surveys*

Surveys were sent using Survey Monkey. An *End of Session Survey* was sent at the end of each session (see Appendix D). The *End of Program Survey* was sent after completion of the program (see Appendix E). The intent of the end of session surveys was to capture the participants' feedback after each individual session including what they did and did not like about it. The end of program survey was intended to get their overall impressions of the program and their experience of it.

### *Interviews*

As a more comprehensive evaluation, a third phase using an interpretive description approach was added to elicit more information about the effectiveness of the program based on the participants' experience. The qualitative portion of the project was guided by Nola Pender's Health Promotion Model and the Adventist Framework for Nursing. The interpretive description method was chosen to elicit the experience of participants for the purpose of understanding individual characteristics and experiences including both prior related behavior and personal factors, as well as behavior-specific cognitions and affect. These factors can play a role in committing to a plan of action and ultimately impact behavioral outcomes.

**Dialogic Engagement.** The experience of program participants was collected through in-depth semi-structured interviews conducted by the Project Leader using dialogic engagement. Appointments were scheduled for 45-minute phone interviews with individuals who chose to participate in the qualitative strand of the study. Participants could opt to complete interviews in the online meeting room if they preferred. Each interview lasted from 30 to 60 minutes

depending on how much the individual chose to share. Not all questions were asked of each participant as the goal of the dialogic method is to allow participants to speak freely about their experience (Ball, 2009). A list of possible interview questions was used as a guide or tool to prompt further dialog regarding different aspects of the program (see Appendix A). The investigator took typewritten notes during the interviews. Notes were reviewed for accuracy and completeness at the end of each session. No member checking was done due to time and resource limitations and as to not add to the participant burden of this program.

### Data Collection Procedures

Pre-intervention data were collected at the initial clinic visits. Paper forms were completed by program participants and both the information collected and the biometric data were entered into the EMR by the Project Leader. Biometric data were also obtained and entered in the EMR at the post-intervention clinic visit. Interview data were collected electronically in the form of typewritten notes during the interviews. Data were protected as described in regard to the protection of human subjects.

## Data Evaluation Plan

### Evaluation Measures

The primary outcome to be evaluated, linked to Phase One Objective Two and Phase Two Objective One, was weight loss as evidenced by pre- and post-intervention measurements of participants' BMI in both the Pure and Combined Groups. The secondary outcomes, linked to Phase One Objective Three and Phase One Objective Two, were also evaluated pre- and post-intervention in the Pure Group and in the combined group when available: waist circumference (WC), systolic blood pressure (SBP), diastolic blood pressure (DBP), total cholesterol (TC), low-

density lipoprotein (LDL), high-density lipoprotein (HDL), fasting glucose (GLU), and triglycerides (TRIG).

## Statistical Analysis of Quantitative Data

The pilot project provided the initial statistical data to evaluate the effectiveness of the program. Because the focus was on achieving weight loss, the pilot program was conducted to determine if statistically significant weight loss can be achieved by individuals participating in the program as evidenced by pre- and post-intervention BMI. A statistician was consulted and provided statistical analysis using R (R Core Team, 2020). For the primary outcome (BMI), the paired differences of the Pure Group and Combined Group were evaluated statistically with a Wilcoxon Signed Rank test due to the small number of participants. For the secondary outcomes, the paired differences of the Pure Group and Combined Group (when available) were also evaluated statistically with a Wilcoxon Signed Rank test due to the small number of participants.

## Evaluation of Qualitative Data

### *Extraction-Synthesis*

An analysis of the participants' comments was done using the extraction-synthesis process (Parse, 2014). This entailed reviewing typewritten notes repeatedly and extracting the key concepts and themes. The themes of the experience were then synthesized into an outline guided by the Nola Pender Health Promotion Model and the Adventist Framework for Nursing.

### *Heuristic Interpretation*

Heuristic interpretation was then used to integrate these concepts and gain insight to the experiences of the nurses who participated in the programs. Interpretation of the lived experiences of participants involved evaluating the themes that were identified in relation to Nola Pender Health Promotion Model and the Adventist Framework for Nursing.

# Chapter Four: Analysis of Results

This chapter analyzes the description of the sample, the description of the variables, the analysis of the project question and hypothesis, and the unintended consequences. The analysis of the project question and hypothesis is presented first for the participants of the pilot study (i.e., the Pure Group). The biometric changes at the end of end of the eight-week pilot program are then examined. Next, results from the expanded data (i.e., the Combined Group) which include participants of all three programs held in 2020 are explained. The results of in-depth interviews with eight of the Combined Group participants are also outlined. Finally, a mixed methods integration of the quantitative and qualitative data is presented.

## Description of the Sample

Contact was made with eight nurses who were interested in the pilot study. Two were from Canada and did not meet residency requirements of Washington or Oregon states. One was excluded due to having prior bariatric surgery, which was one of the exclusion criteria. The remaining five participants underwent the initial evaluation. Of those, one did not qualify due to not having a BMI greater than 25. Several other healthcare workers who were not nurses also expressed interest in the program. This final group of four eligible participants is referred to as the Pure Group. Of these, one participant dropped out of the program after the second week. All but one of the participants were Caucasian; one was Hispanic. One was male and the rest were female. They ranged in age from 51 to 60 years of age. All of the participants were all hospital staff nurses that worked eight- or twelve-hour dayshifts.

Due to the small number of eligible participants who completed the pilot program, it was decided that data for previous program participants should be considered in the evaluation of the program. The nurse who did not meet eligibility requirements for BMI was included in this

group as were four participants from the previous two programs, two from the January 2020 program and two from the July 2020 program. These five participants in addition to the original four participants in the Pure Group are collectively referred to as the Combined Group. Eight participants were Caucasian and one was Hispanic. Eight were female and one was male. They ranged from 37 to 61 years of age.

## Description of the Variables

The independent variable of this pilot program was a nurse practitioner-led, evidence-based, eight-week online ITLC program. The intervention was a 90-minute session held in an online meeting room and facilitated by the Project Leader once weekly for eight weeks.

The primary dependent variable was BMI. Pre- and post-intervention height and weight was collected for all program participants. As weight loss is the ultimate goal of any treatment for obesity, this was the primary factor under consideration and used as a measure of effectiveness for the program.

Secondary dependent variables were included that are known to be risk factors associated with obesity. The secondary measurements were waist circumference (WC) measured in inches, systolic blood pressure (SBP) measured in millimeters of mercury (mmHg,) diastolic blood pressure (DBP) measured in mmHg, fasting glucose (GLU) measured in milligrams per deciliter (mg/dL), total cholesterol (TC) measured in mg/dL, high-density lipoprotein (HDL) measured in mg/dL, triglycerides measured in mg/dL, and low- density lipoprotein (LDL) measured in mg/dL. These were collected for the Pure Group and were available for only one of the Combined Group participants.

## Quantitative Analysis of Research Questions and Hypothesis

Quantitatively, this scholarly project evaluated whether biometric data could provide

improved understanding regarding the effectiveness of an online eight-week, nurse practitioner-led Lifestyle Medicine ITLC program for weigh loss in nurses who are obese. The quantitative data described below work in conjunction with qualitative interview data to provide a comprehensive response to the scholarly project research question.

**Pure Group Descriptive Statistics**

For the primary outcome, weight loss, the paired differences were evaluated statistically with a Wilcoxon signed rank test. The mean weight loss for the Pure Group in eight weeks was 13.13 pounds with a *SD* of 0.9 pounds ($\rho = 0.25$). The corresponding change in BMI was -2.16 $kg/m^2$ ($\rho = 0.25$). In the Pure Group, weight loss was not statistically significant (see Table 2).

**Table 2**

*Pure Group Anthropometric Measurements: Eight Weeks Minus Baseline*

Anthropometric Measurements: Baseline Data

| ID | Wt | BMI | WC | SBP | DBP |
|---|---|---|---|---|---|
| 1 | 158.60 | 27.70 | 32.00 | 129.00 | 83.00 |
| 2 | 255.20 | 35.10 | 44.50 | 141.00 | 80.00 |
| 3 | 168.20 | 29.60 | 38.00 | 129.00 | 76.00 |
| 4 | 194.60 | 35.00 | 41.00 | 117.00 | 78.00 |

Anthropometric Measurements: At Eight Weeks

| ID | Wt | BMI | WC | SBP | DBP |
|---|---|---|---|---|---|
| 1 | 146.40 | 25.50 | 30.50 | 117.00 | 63.00 |
| 2 | 242.00 | 33.30 | 42.50 | 135.00 | 84.00 |
| 3 | 154.20 | 27.10 | 36.00 | 117.00 | 80.00 |
| 4 | NA | NA | NA | NA | NA |

Anthropometric Measurements: Eight Weeks - Baseline

| ID | Wt | BMI | WC | SBP | DBP |
|---|---|---|---|---|---|
| 1 | -12.20 | -2.20 | -1.50 | -12.00 | -20.00 |
| 2 | -13.20 | -1.80 | -2.00 | -6.00 | 4.00 |
| 3 | -14.00 | -2.50 | -2.00 | -12.00 | 4.00 |
| 4 | NA | NA | NA | NA | NA |
| P-value | 0.250 | 0.250 | 0.174 | 0.174 | >0.999 |

Mean (SD) weight loss in 8 weeks was -13.13 (0.9).

*Note:* Wt = weight in pounds, BMI = Body Mass Index in $kg/m^2$, WC = waist circumference in inches, SBP = systolic blood pressure in mmHg, DBP = diastolic blood pressure in mmHg.

For the secondary outcomes in the Pure Group, WC mean change was -1.83 inches (ρ = 0.174); SBP mean change was -7.33 mmHg (ρ = 0.174); DBP mean change was -4 mmHg (ρ = >0.999); GLU mean change was -11 mg/dL (ρ = 0.25). HDL mean change was -6.67 mg/dL (ρ = 0.346); triglycerides mean change was -5.33 mg/dL (ρ = 0.75); LDL mean change was -31.33 mg/dL (ρ = 0.25). The results for the secondary outcomes for the Pure Group were also not statistically significant (see Table 3). The lipid measurements for Participant Five were excluded in the analysis due to the fact that they introduced a confounding factor by discontinuing their cholesterol medication during the study.

**Table 3**

*Pure Group Lab Measurements: Eight Weeks minus Baseline*

**Labs: Baseline Data**

| ID | Glucose | Chol | HDL | TRIG | LDL | Chol.HDLC.Ratio | Non.HDL |
|---|---|---|---|---|---|---|---|
| 1 | 109.00 | 306.00 | 64.00 | 87.00 | 222.00 | 4.80 | 242.00 |
| 2 | 111.00 | 178.00 | 49.00 | 88.00 | 111.00 | 3.60 | 129.00 |
| 3 | 95.00 | 188.00 | 85.00 | 36.00 | 92.00 | 2.20 | 103.00 |
| 4 | 121.00 | 295.00 | 66.00 | 243.00 | 184.00 | 4.50 | 229.00 |

**Labs: At Eight Weeks**

| ID | Glucose | Chol | HDL | TRIG | LDL | Chol.HDLC.Ratio | Non.HDL |
|---|---|---|---|---|---|---|---|
| 1 | 95.00 | 248.00 | 54.00 | 97.00 | 172.00 | 4.60 | 194.00 |
| 2 | 101.00 | 167.00 | 49.00 | 71.00 | 102.00 | 3.40 | 118.00 |
| 3 | 86.00 | 140.00 | 75.00 | 27.00 | 57.00 | 1.90 | 65.00 |
| 4 | NA | NA | NA | NA | NA | NA | NA |

**Labs: Eight Weeks - Baseline**

| ID | Glucose | Chol | HDL | TRIG | LDL | Chol.HDLC.Ratio | Non.HDL |
|---|---|---|---|---|---|---|---|
| 1 | -14.00 | -58.00 | -10.00 | 10.00 | -50.00 | -0.20 | -48.00 |
| 2 | -10.00 | -11.00 | 0.00 | -17.00 | -9.00 | -0.20 | -11.00 |
| 3 | -9.00 | -48.00 | -10.00 | -9.00 | -35.00 | -0.30 | -38.00 |
| 4 | NA | NA | NA | NA | NA | NA | NA |
| P-value | 0.250 | 0.250 | 0.346 | 0.750 | 0.250 | 0.174 | 0.250 |

*Note.* Chol = total cholesterol in mg/dL, HDL= high-density lipoprotein in mg/dL, TRIG = triglycerides in mg/dL, LDL = low-density lipoprotein in mg/dL, TC.HDL.Ratio (calc) = total cholesterol to high-density lipoprotein ratio, Non.HDL = Non-high-density lipoprotein mg/dL (calc).

**Combined Group Descriptive Statistics**

In the second phase of this study, for the primary outcome, weight loss, the paired differences for the Combined Group were also evaluated statistically with a Wilcoxon signed rank test. For the combined group the mean weight loss in eight weeks was 16 pounds with a *SD* of 6.92 pounds ($\rho$=0.008); the corresponding change in BMI was -1.98 $kg/m^2$ ($\rho$=0.016). In the Combined Group, weight loss and change in BMI were found to be statistically significant (see Table 4).

For the secondary outcomes in the Combined Group, WC mean change was -2.5 inches ($\rho$ = 0.098); SBP mean change was -12.5 mmHg ($\rho$ = 0.098); DBP mean change was -3 mmHg ($\rho$ = >0.999); GLU mean change was -13 mg/dL ($\rho$ = 0.125); TC mean change was -39 mg/dL ($\rho$ = 0.25); HDL mean change was -6.67 mg/dL ($\rho$ = 0.346); triglycerides mean change was -5.33 mg/dL ($\rho$ = 0.75); LDL mean change was -31.33 mg/dL ($\rho$ = 0.25). The results for the secondary outcomes for the Combined Group were also not statistically significant (see Table 5).

**Table 4**

*Combined Group Anthropometric Measurements: Eight Weeks Minus Baseline*

**Anthropometric Measurements: Baseline Data**

| ID | Wt | BMI | WC | SBP | DBP |
|---|---|---|---|---|---|
| 1 | 158.60 | 27.70 | 32.00 | 129.00 | 83.00 |
| 2 | 255.20 | 35.10 | 44.50 | 141.00 | 80.00 |
| 3 | 168.20 | 29.60 | 38.00 | 129.00 | 76.00 |
| 4 | 194.60 | 35.00 | 41.00 | 117.00 | 78.00 |
| 5 | 126.60 | 22.80 | 37.00 | 137.00 | 73.00 |
| 6 | 240.00 | 35.40 | NA | NA | NA |
| 7 | 273.00 | 41.50 | NA | NA | NA |
| 8 | 218.80 | 34.30 | NA | NA | NA |
| 9 | 259.00 | 45.90 | NA | NA | NA |

**Anthropometric Measurements: At Eight Weeks**

| ID | Wt | BMI | WC | SBP | DBP |
|---|---|---|---|---|---|
| 1 | 146.40 | 25.50 | 30.50 | 117.00 | 63.00 |
| 2 | 242.00 | 33.30 | 42.50 | 135.00 | 84.00 |
| 3 | 154.20 | 27.10 | 36.00 | 117.00 | 80.00 |
| 4 | NA | NA | NA | NA | NA |
| 5 | 119.40 | 21.50 | 32.50 | 117.00 | 73.00 |
| 6 | 213.00 | 36.50 | NA | NA | NA |
| 7 | 256.00 | 38.90 | NA | NA | NA |
| 8 | 207.00 | 32.40 | NA | NA | NA |
| 9 | 233.40 | 41.30 | NA | NA | NA |

**Anthropometric Measurements: Eight Weeks - Baseline**

| ID | Wt | BMI | WC | SBP | DBP |
|---|---|---|---|---|---|
| 1 | -12.20 | -2.20 | -1.50 | -12.00 | -20.00 |
| 2 | -13.20 | -1.80 | -2.00 | -6.00 | 4.00 |
| 3 | -14.00 | -2.50 | -2.00 | -12.00 | 4.00 |
| 4 | NA | NA | NA | NA | NA |
| 5 | -7.20 | -1.30 | -4.50 | -20.00 | 0.00 |
| 6 | -27.00 | 1.10 | NA | NA | NA |
| 7 | -17.00 | -2.60 | NA | NA | NA |
| 8 | -11.80 | -1.90 | NA | NA | NA |
| 9 | -25.60 | -4.60 | NA | NA | NA |
| P-value | 0.008 | 0.016 | 0.098 | 0.098 | >0.999 |
| Mean Diff (95% CI) | -16.00 (-21.25, -12.15) | -1.98 (-2.94, -0.83) | -2.50 (-4.50, -1.75) | -12.50 (-20.00, -8.00) | -3.00 (-20.00, 4.00) |

*Note:* Wt = weight in pounds, BMI = Body Mass Index in kg/m$^2$, WC = waist circumference in inches, SBP = systolic blood pressure in mmHg, DBP = diastolic blood pressure in mmHg.

**Table 5**

*Combined Group Lab Measurements: Eight Weeks Minus Baseline*

**Labs: Baseline Data**

| ID | Glucose | Chol | HDL | TRIG | LDL | TC.HDL.Ratio | Non.HDL |
|---|---|---|---|---|---|---|---|
| 1 | 109.00 | 306.00 | 64.00 | 87.00 | 222.00 | 4.80 | 242.00 |
| 2 | 111.00 | 178.00 | 49.00 | 88.00 | 111.00 | 3.60 | 129.00 |
| 3 | 95.00 | 188.00 | 85.00 | 36.00 | 92.00 | 2.20 | 103.00 |
| 4 | 121.00 | 295.00 | 66.00 | 243.00 | 184.00 | 4.50 | 229.00 |
| 5 | 112.00 | 209.00 | 50.00 | 130.00 | 134.00 | 4.20 | 159.00 |
| 6 | 104.00 | 205.00 | 54.00 | 105.00 | 130.00 | 3.80 | 151.00 |
| 7 | NA | NA | NA | NA | NA | NA | NA |
| 8 | NA | NA | NA | NA | NA | NA | NA |
| 9 | NA | NA | NA | NA | NA | NA | NA |

**Labs: At Eight Weeks**

| ID | Glucose | Chol | HDL | TRIG | LDL | TC.HDL.Ratio | Non.HDL |
|---|---|---|---|---|---|---|---|
| 1 | 95.00 | 248.00 | 54.00 | 97.00 | 172.00 | 4.60 | 194.00 |
| 2 | 101.00 | 167.00 | 49.00 | 71.00 | 102.00 | 3.40 | 118.00 |
| 3 | 86.00 | 140.00 | 75.00 | 27.00 | 57.00 | 1.90 | 65.00 |
| 4 | NA | NA | NA | NA | NA | NA | NA |
| 5 | 93.00 | NA | NA | NA | NA | NA | NA |
| 6 | NA | NA | NA | NA | NA | NA | NA |
| 7 | NA | NA | NA | NA | NA | NA | NA |
| 8 | NA | NA | NA | NA | NA | NA | NA |
| 9 | NA | NA | NA | NA | NA | NA | NA |

**Labs: Eight Weeks - Baseline**

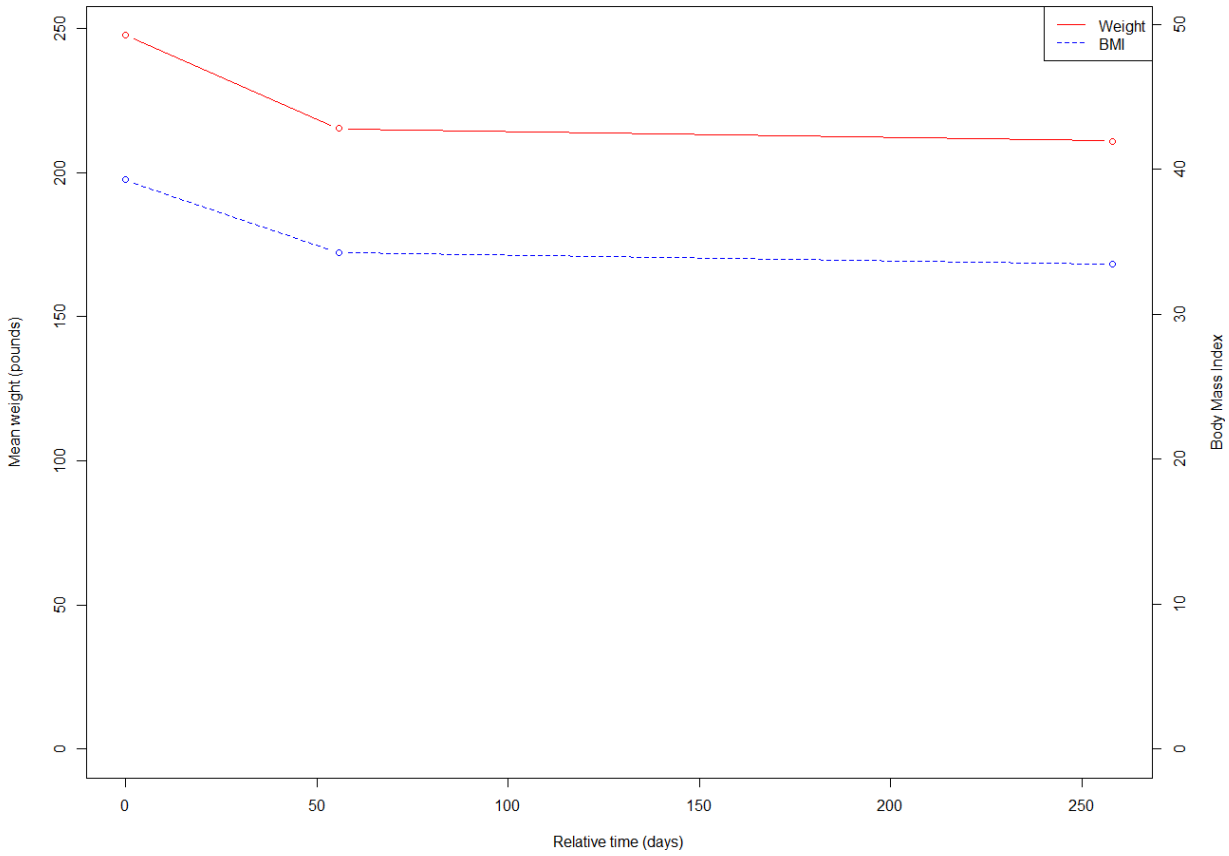
| ID | Glucose | Chol | HDL | TRIG | LDL | TC.HDL.Ratio | Non.HDL |
|---|---|---|---|---|---|---|---|
| 1 | -14.00 | -58.00 | -10.00 | 10.00 | -50.00 | -0.20 | -48.00 |
| 2 | -10.00 | -11.00 | 0.00 | -17.00 | -9.00 | -0.20 | -11.00 |
| 3 | -9.00 | -48.00 | -10.00 | -9.00 | -35.00 | -0.30 | -38.00 |
| 4 | NA | NA | NA | NA | NA | NA | NA |
| 5 | -19.00 | NA | NA | NA | NA | NA | NA |
| 6 | NA | NA | NA | NA | NA | NA | NA |
| 7 | NA | NA | NA | NA | NA | NA | NA |
| 8 | NA | NA | NA | NA | NA | NA | NA |
| 9 | NA | NA | NA | NA | NA | NA | NA |
| P-value | 0.125 | 0.250 | 0.346 | 0.750 | 0.250 | 0.174 | 0.250 |
| Mean Diff (95% CI) | -13.00 (-19.00, -9.50) | -39.00 (-58.00, -11.00) | -6.67 (-10.00, 0.00) | -5.33 (-17.00, 10.00) | -31.33 (-50.00, -9.00) | -0.23 (-0.30, -0.20) | -32.33 (-48.00, -11.00) |

*Note.* Chol = total cholesterol in mg/dL, HDL= high-density lipoprotein in mg/dL, TRIG = triglycerides, in mg/dL LDL = low-density lipoprotein in mg/dL, TC.HDL.Ratio (calc) = total cholesterol to high-density lipoprotein ratio, Non.HDL = Non-high-density lipoprotein mg/dL (calc).

Follow-up data were also obtained for the four individuals who participated in the earlier programs (i.e., the Follow-Up Group). While data were again limited by a small sample size, the data showed the mean weight continued to trend down at the six to twelve months follow up (see Figure 3).

**Figure 3**

*Weight and BMI Trajectories for Follow-up Group*




*Note*. Weight and BMI Trajectories show initial weight loss achieved during the initial program continued to be maintained and even to decrease slightly for participants who had participated in the January and July 2020 programs.

## Qualitative Analysis of Research Questions and Hypothesis

Using the extraction-synthesis process, themes were identified that were commonly described by the participants. These themes were synthesized into an outline guided by the Nola Pender Health Promotion Model (see Figure 4). In the Nola Pender Health Promotion Model, the patient, a nurse with obesity, arrives with individual characteristics and experiences. These include prior related behavior and personal factors including biological, psychological, and sociocultural factors. Then, behavior specific cognitions and affects come into play and contribute to the commitment to a plan of action, in this case commitment to participation in the ITLC program. Immediate competing demands and preferences also play a role in the engagement in health promoting behavior and contribute ultimately to the behavioral outcome of interest, in this case weight loss. Competing demands are situations over which there is low control such as work schedule; preferences are things over which there is high control (e.g., food preferences).

### Individual Characteristics and Experiences

#### *Prior Related Behavior*

People arrive to every healthcare encounter with a history of prior experiences. These experiences shape the lens with which we view the current encounter. It is helpful to know more about these to better understand the patient perspective and promote patient-centered care. This study identified a number of the factors that contributed to the health promoting behaviors of the participants. Several themes were identified regarding prior related behavior.

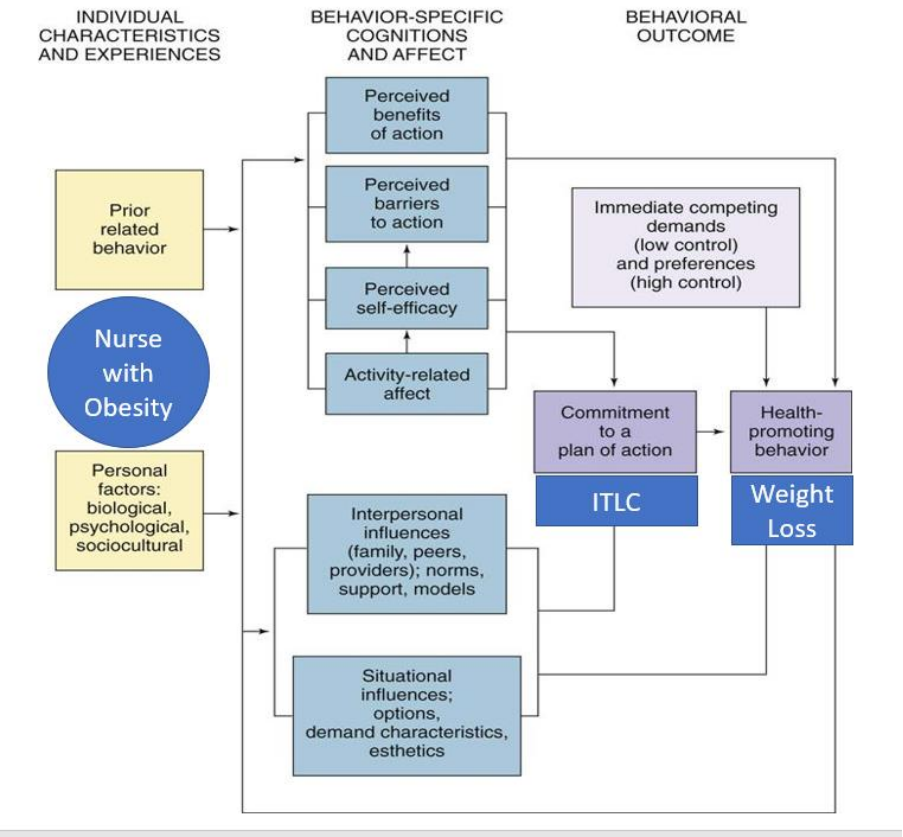
**Dieting and Exercising for Weight Loss.** Many of the nurses who completed the program had already been dieting for weight loss. Participant Two “was already on a weight loss journey” and Participant Three was “dieting and exercising and wasn’t making any progress.”

Many had tried some form of high protein diet. Participant Three was “on Keto diet for a while.” Participant Six also “was trying to follow Keto loosely.” Many of them were also doing regular physical activity such as Participant Two who was “hiking every day I wasn’t working” and “was doing four miles at work with stairs.”

**Irregular Meal Patterns.** Another very common theme was that participants had irregular eating patterns such as explained by Participant One “A hodge-podge of different things,” “rarely ate three meals,” and had “no gaps between eating.” Participant Nine explained it as being “more disorganized than with the program.”

**Figure 4**

*Nola Pender Health Promotion Model in Conjunction with Nurse Obesity*



**Diet Composition.** Diets were also noted to be, as Participant One expressed "very low in vegetables." Most of them had diets high in animal products. Participant Five stated "I thought I was being healthy having egg muffin with cheese and eggs…way too many eggs…there goes the cholesterol."

### *Personal Biological and Psychological Factors*

Personal factors identified included both and biological and psychological factors.

**Elevated Biomarkers**. Biological factors included elevated biomarkers such as Participant Two who was "surprised to see the glucose number" and remarked, "cholesterol was less surprising given all of the eggs I was eating." Participant Three also noted "my cholesterol was creeping up."

**High Levels of Work Stress.** The most prominent psychological factor was high levels of work stress. All eight participants made mention of stress playing a role such as expressed by Participant Nine who explained, "I had a lot of stress at work" and was "feeling stressed all of the time."

## Behavior-Specific Cognitions and Affect

In exploring the behavior-specific cognitions and affect, themes were also noted regarding perceived benefits of action, perceived barriers to action, perceived self-efficacy, and activity-related affect.

### *Perceived Benefits of Action*

**Weight Loss.** Themes regarding perceived benefits of action included the possibility of furthering weight loss efforts such as Participant Two who explained, "I was looking for something that would continue the progress."

**Improved Health.** The potential for improved health was also important as expressed by Participant Five who said she was "knowing I needed to change my habits if I wanted to see my grandkids."

**Social Support.** The benefit of social support was explained by Participant Seven who said "I want and need the comradery and support. It does help."

### *Perceived Barriers to Action*

There were also several themes that came out regarding perceived barriers to action.

**Meal Planning and Preparation.** One theme was the ability to plan and prepare meals. Participant One explained "I am not a super creative cook." Participant Eight said "I need a cook to pre-make my meals."

**Fatigue.** They also expressed that fatigue, especially being tired after work was an obstacle. This affected attendance of the sessions as expressed by Participant Seven who said, "it was hard after work sometimes." Fatigue also affected meal preparation. Participant Nine explained "I always struggle in the evening" and it is "the tough part of my day. Having dinner prepped is important."

### *Perceived Self-Efficacy*

**Self-Confidence.** Regarding perceived self-efficacy the participants generally expressed confidence in their ability to lose weight although they also expressed some concern about potential weight regain. Participant Two explained this as being "pretty confident," but also stated "I have backslid so many times it is hard to have a lot of confidence." Participant Six said "I was pretty confident to begin with. Then a few weeks, in I was really confident."

### *Activity-Related Affect*

**Positive Affect Associated with Small Group Interaction.** In exploring the activity-

related affect of participation in the group, many of the participants expressed that they enjoyed participating in the small group and being able to both share their experiences as well as to hear the experiences of others. Participant Nine said “I felt comfortable with you and everyone;” “I felt like it was a good fit.” “I loved it” and “I felt more optimistic about things even if you’re not perfect.” Participant Six expressed “it was great to voice how we were doing every week and bring up questions, problems, and [ask] is this normal?”. Participant Eight said it this way: “I like that people were sharing and willing to open up and talk about their experiences. It is nice to know what people were going through.”

### *Interpersonal Influences*

There were also themes that emerged regarding interpersonal influences and were expressed as being important both at home and at work.

**Family Issues.** Regarding family, most reported having good social support, but did report having issues with family and friends during the program. Participant One explained that it “was hard on my husband. He loves to give me food. He knows I like treats” and “he had to change his ways.” Participant Six said it this way: “my family had to get used to [the fact] that I don’t eat what they eat very often.” Participant Seven explained “it caused some headaches because I was asking for people not to have crap in the house and it escalated at times.”

**Peer Support.** Peer support was another interpersonal theme that emerged. Participant Seven said “I liked it. I felt like I had comradery and girlfriends to share with.” The same participant expanded by saying “having people who are like-minded makes you more confident” and “you are wanting to do better because you are around people who are encouraging.” Several of the participants also shared the sentiments of Participant Three who said “I liked that there were other co-workers in the group.”

### *Situational Influences*

**Easy Access to Processed Food.** Situational influences were noted to have both negative and positive impacts. Negative influences included having processed snack foods in the environment. Participant One said “I need to get granola bars out of the house.”

**Learning New Information.** Positive situational influences were reported about the program including learning new information. Participant Three explained “it opened my eyes to how much hidden sugar is in things. It is surprising!” Participant Five said it was “very informative to see the classes on the brain. It was quite eye opening!”

**Role Models.** Another positive influence was having positive role models. Participant Eight explained that they were more confident after “seeing how successful (Participant Six) was.” Participant Three also said “I was confident because you and Susie did it.”

### *Immediate Competing Demands and Preferences*

There were also immediate competing demands that were identified including the needs of work and family.

**Work Demands.** Participant Eight explained “March got really busy, business tripled and really increased stress. I worked a lot of hours.” Participant Seven reported “the biggest problem is my work schedule is insane,” “I get no break,” and “I don’t get a lunch.”

**Family Demands.** Regarding their family Participant Six explained “sometimes I have to rearrange schedules to get what I need.”

**Preference for In-person Program.** Common preferences were also identified. The most common preference expressed was that participants would have preferred to have in-person sessions rather than on Zoom. Participant Two expressed it like this: “I am not as keen on doing

online. I am more of an in-person kind of guy. You lose a lot of the interaction that is needed to maintain our humanity."

**Preference for Small Group Setting.** Participants also expressed satisfaction with the small group setting. Participant Nine said "I like the small group. It was a good size, not too big. I liked the way it was structured. Everyone got to share."

## Behavioral Outcomes

### *Making a Commitment to a Plan of Action*

All of the individual personal factors and experiences, as well as thoughts and feelings contribute, to a person making a commitment to a plan of action. Participant One expressed "I am the type of person that just bulls forward. I knew I could do it for two months." Participant Nine, who has been participating since July 2020, explained it "comes down to me making that choice every day. Make the choice of how you are going to do your day. Commit to the choices for the day. Try to take it day by day. Think about what your goals are. Stay committed to optimism." And for Participant Six, who took the program over a year ago, it was about "figuring out how to stay the course and not veering from the course."

### *Health Promoting Behaviors*

Themes in behavioral outcomes were also shared. These included changes in diet composition, changes in dietary routines, and a reduction of foods known to contribute to obesity.

**Plant-Based Diet.** Many of the participants explained that since taking the program they have transitioned toward eating a plant-based diet. This was reported at a variety of levels including being "more plant based than before (Participant One), "pretty much plant based"

(Participant Three), or "have gone completely plant based. All of a sudden it is a non-option. I think I have gotten a handle on it and it isn't as hard as I thought" (Participant Eight).

**Increased Fruits and Vegetables.** Almost all of the participants also expressed that they were now eating "very high intake" of vegetables and fruits (Participant One). Participant Two said "I buy as many vegetables as I used to but now, I eat them all." Participant Seven reported eating "more beans and greens."

**Awareness of Quantities.** They also verbalized having more awareness of how much they are eating. Participant Eight said "I definitely am more aware of portions more than I used to be." Participant Nine also expressed "being more conscious about the types and amounts of food" they are eating.

**Fewer Processed Foods.** Another theme that emerged was participants eating less sugar and fewer processed foods. Participant Seven stated "I have cut back a lot of the processed food since starting the program" and, while she admits to not continuing all of the lifestyle behaviors, she stated "what I have stuck with is not eating premade food." Other participants reported eliminating specific food items. Participant Five reported "no more ice cream. I am not buying those anymore" and "I used to eat protein bars."

**Regular Mealtimes.** The participants often expressed adopting a more regulated mealtime schedule after completing the program. Participant Two said "on my days off I have more structure of what I am eating." Participant Eight said they are "way better at eating regularly, taking breaks 99% of the time, and eating breakfast and lunch." Participant Six explained "it has been more automatic to make food choices."

### *Results Experienced*

**Improved Health.** These behavioral changes and commitment to participating in the ITLC program did result in meaningful outcomes reported by participants. Participant Nine reported "I was happy with my results. I was weaning off my inhalers and all of my blood pressure readings came down."

**Feeling Better.** Participant Three said "I feel better because I do like that, I am losing weight in other areas, getting rid of belly fat." Participant Six said "I feel great! I feel it has been lifechanging."

## Mixed Methods Integrated Analysis

By analyzing the combined quantitative and qualitative results, a more comprehensive picture began to emerge. Qualitative results added more detailed insights about the quantitative data, especially in terms of ITLC program efficacy. Each of the eight cases were analyzed and each added insight as to the effects of the program. For example, Participant One, a 57-year-old female who participated in the pilot ITLC program, lost 12.2 pounds or 2.2 $kg/m^2$ in BMI. Her fasting glucose also dropped by 14 points, bringing her from a prediabetic value of 109 mg/dL to a normal value of 95 mg/dL. She also reduced her total cholesterol from a dangerously high level of 306 mg/dL to 248 mg/dL, a drop of 58 mg/dL, and LDL cholesterol by from 222 mg/dL to 172 mg/dL, a drop of 50 mg/dL in just eight weeks. In comparison, atorvastatin 2.5 to 80 mg decreases LDL from 25% to 61% in a dose dependent manner (Nawrocki et al., 1995). So, in this case, the intervention is comparable to the effects of a low-dose statin, which this patient was averse to taking, without any risk of side effects. The Project Leader summarized Participant One's experience as follows:

Before the program, my diet was a hodgepodge of different things. It was very low in vegetables and included a fair amount of processed snack foods and treats. I had been thinking about doing something about my weight because I was not feeling good about how I was looking or feeling. I was confident that participating in the program could help me to move in the right direction. I felt the program was valuable. I particularly liked hearing from others and being able to share and it allowed for better connections at work. Obstacles included not being a super creative cook and learning to relate to family in new ways. Since the program, I continue to eat more fruits and vegetables and less sweets and processed foods, and I plan to continue my weight loss efforts by doing something with my sister-in-law for accountability.

A summary of results for each participant is displayed in Table 6.

**Table 6**

*Integrated Mixed-Methods Results*

| Case/Cohort | Age | Sex | Wt loss | Glu Δ | Chol Δ | LDL Δ | Interpretation of the Participant Narrative |
|---|---|---|---|---|---|---|---|
| Participant 1/ October 2020 | 57 | F | 12.2 | 14 | 58 | 50 | Before the program, my diet was a hodgepodge of different things. It was very low in vegetables and included a fair amount of processed snack foods and treats. I had been thinking about doing something about my weight because I was not feeling good about how I was looking or feeling. I was confident that participating in the program could help me to move in the right direction. I felt the program was valuable. I particularly liked hearing from others and being able to share and it allowed for better connections at work. Obstacles included not being a super creative cook and learning to relate to family in new ways. Since the program, I continue to eat more fruits and vegetables and less sweets and processed foods, and I plan to continue my weight loss efforts by doing something with my sister-in-law for accountability. |
| Participant 2/ October 2020 | 51 | M | 13.2 | 10 | 11 | 9 | I had started to diet and exercise for weight loss two months prior to starting the program. Before this my diet was high in processed snack foods and treats. In August, I started eating a high animal protein diet and hiking every day I wasn't working and walked four miles plus stairs at work. I was at the point where I would usually get |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | bored and back track and thought the program sounded perfect for what I needed. I was surprised to see how high my glucose was, but less surprised about the cholesterol because of all the eggs I was eating. I liked participating in small groups but felt like it would have been better in person because online you lose a lot of the interaction that is needed to maintain our humanity. Since the program, I buy as many vegetables as I used to, but now I eat them all. I do more preparation ahead of time and am shooting for eating at scheduled times. I feel pretty good about the changes I have made. My wife is also pretty psyched about the progress. Participating in the program has had a positive impact overall. |
| Participant 3/<br><br>October 2020 | 60 | F | 14.0 | 9 | 48 | 35 | I have been dieting and exercising since 2019 and was not making any progress. My cholesterol was creeping up and I was having to shop at different stores and wear a cover up. I was confident about losing weight because you had done it. I liked the Zoom meetings and liked that there were coworkers in the group. I am now eating pretty much plant based. I feel better because I am getting rid of belly fat and feeling better about life. I think this is a great approach because it focuses on eating healthier, but also encompasses other areas, too, that affect your environment and relationships. |
| Participant 4/<br><br>October 2020 | 27 | F | - | - | - | - | This young Hispanic woman with obesity, pre-diabetes, and hyperlipidemia discontinued participation after the second class, reporting that she was feeling too stressed out. She reports she had just started a new job and was already stressed with that and was also going to have to move by the end of the month. She was planning to continue to make dietary changes but was feeling too overwhelmed to continue the program at that time. |
| Participant 5/<br><br>October 2020 | 59 | F | 7.2 | 19 | -15 | -19 | I thought I was eating healthy eating eggs, cheese, and yogurt. I learned both my blood sugar and my cholesterol were a problem and I knew I needed to change my habits if I wanted to see my grandkids. The program was crazy different! I was pretty confident I could achieve my goals. The program was very informative and was eye opening. I like having the accountability and support of the small group. I am eating breakfast regularly and am eating more plant based. I am pretty confident that I can keep doing what I am doing.<br>**Note: Participant independently discontinued taking her prescribed lipid-lowering medication during the program resulting in lipids increasing.* |
| Participant 6/<br><br>January 2020 | 44 | F | 75.5 | 15 | 9 | 11 | Before the program, I was trying to follow Keto loosely, but was always trying to find ways to have sugar. I did 45 minutes of cycling or walking three to four times a week. My sleep was interrupted because of heartburn because of problems with a hiatal hernia. I was nervous when I started the small group because I never did anything like that. I liked hearing how others were struggling so I didn't feel alone. It was also good |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | to voice problems and bring up questions. There have been a lot of obstacles such as eating different food from my family and learning how to navigate situations like vacations, traveling, and dining in restaurants. Everything in my life has changed since starting the program. It has been a year and I have gone through a lot of ups and downs but, overall, I am more calm and less triggered by things. I feel great. I have been able to achieve something I have never been able to achieve before, and it has been lifechanging. |
| Participant 7/<br><br>January 2020 | 61 | F | 9.0 | - | - | - | I have been basically plant based for years but ate lots of premade meals before starting the program. I always have underlying stress at work and home. I liked having the comradery and support. It does help. Being around people who are likeminded makes you more confident. You want to do better because you are around people who are encouraging. I think it is good to come together and learn from each other's experiences. I am not where I wanted to be, but this year has been a mess and I am just thankful I didn't get sick. I continue to eat more veggies and less processed foods and I am hoping to maintain until things get a little easier and get back to normalcy. I think this is a great program. |
| Participant 8/<br><br>July 2020 | 47 | F | 19.1 | - | - | - | I had already cut sugar and flour out of my diet in February 2020. Before that, pastries were a big thing for me. I had plateaued and was pretty confident that the program would help me achieve my goals. I liked that people in the small group were willing to open up and talk about their experiences. I have now gone completely plant based. All of a sudden it is a non-option. I am really confident that I will be able to sustain the changes I have made. I think the program is super beneficial and I wish more people would at least try it. I hope you keep doing this for people. |
| Participant 9/<br><br>July 2020 | 37 | F | 17.9 | - | - | - | My diet was more disorganized before the program. I exercised for an hour five times per week. I liked the initial evaluation because it was the first time I was able to talk honestly about my weight and food. It wasn't a judgmental situation. I was eager to do the group, but at the same time was hesitant to go down this road again. I wasn't confident at all, but I felt comfortable with you and the other ladies. I felt like I got good support and feedback. I liked that everyone got to share. I was happy with my results. I was able to wean off my inhalers and my blood pressure readings came down. I felt more optimistic about things even if I'm not perfect. I liked that the program addresses the whole person. There is so much more than food and weight issues. All of the other issues are really important. |

*Note.* Wt loss = Total weight loss since baseline in pounds, Glu = Reduction of fasting glucose in mg/dl pre- and post-intervention in October Cohort and when available in other participants,

Chol = Reduction of total cholesterol in mg/dl pre- and post-intervention in October Cohort and when available in other participants, LDL = Reduction of LDL cholesterol in mg/dl pre- and post-intervention in October Cohort and when available in other participants.

## Unintended Consequences: Positive and Negative

The pilot ITLC program had initially been intended to address uncertainties about the program, to evaluate the process, and to determine if the program was a feasible undertaking for this low-volume, low-overhead (LVLO) clinical setting. It also was intended to be used to make refinements in the protocol, the process of doing biometric measurements, the data collection and management procedures, and program delivery. It was expected that much would be learned from doing this pilot with a small group of nurses. The pilot was not initially expected to focus on intervention outcomes, but rather on testing of the processes. As the project developed, an unintended design emerged in which the intervention outcome became more of the priority and necessitated two additional phases to show the efficacy of the program.

The unexpected redesign and addition of Phases Two and Three required additional time and effort to complete. Due to the limited time and resources of the solo provider practice, it was heavily taxing process. It also resulted in additional burdens on the participants, busy working professionals for which time and energy are limited resources.

Another unintended consequence was that Participant Five, perhaps to test for themselves the efficacy of the program as compared to taking cholesterol reducing medication, independently discontinued their medication. This introduced an unanticipated confounding factor and resulted in an increase in lipid levels. No adverse event occurred because of this decision, however.

The positive unintended consequence of adding additional phases was the gathering of more in-depth information. Statistical data from the Phase Two quantitative study added some additional support for the effectiveness of the program in producing weight loss outcomes in obese patients. The qualitative phase of the study allowed the Project Leader to spend additional individualized time with each of the program participants, thus allowing for a greater understanding of their program experiences. This information would not have been known had this phase of the project not been completed. In addition to fulfilling one of the end-of-program student learning objectives (EOP SLO) for Southern Adventist School of Nursing, data of this nature may also enhance patient-centered care in future programs (see Appendix F).

# Chapter Five: Discussion of Findings

Chapter Five presents a discussion of findings in relation to the overall purpose of this scholarly project. Mixed methods data analysis is integrated in relation to project outcomes and the body of existing knowledge surrounding lifestyle medicine. The chapter also explains key observations, strengths, and limitations of the project. The overall clinical significance in terms of current best-practice recommendations, implications for the ITLC programs, and possible avenues for future research is also included.

## Relationship of Outcomes to Research

### Overall Purpose and Discoveries

The purpose of this project was to evaluate the effectiveness of a nurse-practitioner-led online ITLC program that used an evidence-based Lifestyle Medicine approach for the treatment of obesity in nurses. An emergent explanatory three-phase mixed methods design was used in which quantitative data were collected first and additional quantitative and qualitative data were then added to explain results in more depth. The primary intent of the investigation was to pilot an eight-week ITLC program to treat obesity in nurses. Quantitative data consisted of pre- and post-intervention biometric measurements for nurses with obesity who met eligibility requirements and participated in the pilot program (i.e., the Pure Group). In this initial phase, the quantitative data showed no statistically significant improvement in BMI (i.e., the primary outcome measure) or waist circumference, blood pressure, fasting glucose, or lipids (i.e., the secondary outcome measures).

Because of the limited sample size of the Pure Group, analysis was expanded to include participants of two previous iterations of the same program (i.e., Phase Two). For this phase, biometric data for this Combined Group were evaluated at baseline, eight-weeks, and at follow-

up, which was approximately six months for two participants and at one year for another two participants. For purposes of clarification, the first program in January 2020 was opened for all healthcare professionals and the participants were not nurses; one was a naturopathic physician and one was a dental hygienist. The second program in July 2020 was not limited to healthcare professionals and included one nurse and a manager of a retail store.

Quantitative data from the Combined Group indicated statistically significant weight loss after eight-weeks. Because secondary outcome measurements (i.e., waist circumference, blood pressure, fasting glucose, and lipids) were not available the entire Combined Group sample, calculations for secondary outcomes were also not statistically significant.

In Phase Three, a qualitative strand involving in-depth interviews was added. Interviews were conducted with eight program participants to obtain a deeper understanding of the experience of the program. Qualitative data were examined using an interpretive description approach which led to the identification of key themes.

**Qualitative Analysis of Outcomes**

Participants across both the Pure and Combined Groups possessed common characteristics. They were generally middle-aged Caucasian women who worked dayshift. Most of them had already been dieting and exercising and had reached a plateau or were not seeing the results they would have liked. They were looking for a program that would help them further their weight loss efforts. Pre-program diets were found to be high in animal protein, low in vegetables, and high in processed snack foods and treats.

Participants of the programs generally perceived that the benefits of program participation would include weight loss, improved biomarkers, and increases in overall health. Obstacles to participation included not having the time and energy to prepare and cook healthy

food, along with issues with family and friends. Those who participated and completed the program possessed high self-efficacy and expressed confidence in their ability to lose weight. In terms of the activity-related affect, participants expressed enjoyment with the program and found it beneficial. The program participants liked the small group format, but most would have preferred to meet in person rather than online. They also liked sharing the experience with co-workers.

The Project Leader observed that the competing demands of participants' jobs sometimes interfered with their ability to participate, resulting in occasional tardiness or missed sessions. Obstacles to program adherence also included difficulty in meal planning and preparation often attributed to fatigue, especially in the evenings after work. Family and interpersonal demands were observed to be a competing factor at times as well. Food preferences, an additional intermittent complicating factor, were discussed frequently. Adaptive methods to navigate food preferences, including the sharing of ideas and recipes, were provided to accommodate participants' preferences and encourage full participation.

This combination of individual characteristics and experiences, as well as cognitions and affects, resulted in the commitment to the plan of action, participation in the ITLC program, and execution of the health promoting behaviors that resulted in weight loss. Overall, the participants were happy with their results and verbalized having made lifestyle changes they felt they could sustain. Thus, results suggest that the program is effective for white, female, middle-aged nurses.

It is unknown whether these results would be generalizable to other demographics. It is noteworthy to mention that the one participant who dropped out of the project was a young Hispanic woman. She was not able to be contacted for follow up so her program experience could not be ascertained.

**Quantitative Analysis of Outcomes in Relation to Previous Research Findings**

It was expected that the ITLC program would produce positive health outcomes across the primary outcome measure (i.e., weight loss) and the secondary measures (i.e., waist circumference, blood pressure, fasting glucose, and lipids). While the sample size of the Pure Group was too small to establish whether this approach was statistically significant for nurses, the results obtained by the Combined Group participants are promising. The potential clinical significance of the findings cannot be ignored. According to Williamson et al. (2015) "5% as a meaningful marker of weight loss success is here to stay. It provides a benchmark for evaluating whether the patient's response to treatment is "successful." The baseline mean weight of the Pure Group was 188.5 pounds and mean weight loss was 13.13 pounds or 7%. The three participants who completed the program lost 7.7%, 5.2%, and 8.3% of body weight over eight weeks, respectively. In addition, they each lost more than 5 kg (11 lbs.) which is associated with nearly 50% lower risk of poor health outcomes according to Hruby et al. (2016). In comparison, the weight loss of these three individuals was also more than the CHIP program aggregate data of 3.3 kg (7.3 lbs.) during six to nine-week programs (Morton et al., 2016).

The question then becomes, is the weight loss of each of these individuals in eight-weeks enough to be considered clinically impactful? While the results at eight weeks are promising, the recommendation of the Obesity Expert Panel is that the time frame that defines clinical significance is after one year of treatment (Jensen et al., 2014). Therefore, even though all participants in the Pure Group met the 5% benchmark for successful weight loss at eight weeks, they would need to be reevaluated after one year to ascertain whether their results are truly clinically significant.

To further evaluate clinical effectiveness, previous program participants (i.e., the Combined Group) were evaluated. Only two program participants have reached the one-year mark: Participant Six and Participant Seven. Participant Six initially lost 27 pounds in the eight-week program. She continued to follow the dietary recommendations and went on to lose an additional 48.5 pounds and at one year has lost all excess weight, or 31.5% of her initial body weight. According to Fildes et al. (2015), the odds of this happening is one in 124 for women. While 5% is the benchmark for successful weight loss, more weight loss is considered even better, has more health benefits, and is a strong predictor of long-term success (Williamson et al., 2015).

Participant Seven, lost 17 pounds (6.2%) during the initial eight-week program but following the program gained back eight pounds, so at one year they had maintained a weight loss of 3.3% of their initial body weight. Even 2.5 to 5% weight loss has been shown to bring some benefit in some risk factors (Jensen et al., 2014). It remains to be seen if this participant will be like the 50% of patients reported by Fildes et al. (2015) who achieve 5% weight loss but regain it in two years.

**Analysis within the Adventist Framework and the Context of Nursing Knowledge**

The Adventist Framework for Nursing is a holistic model that emphasizes caring, connecting, and empowering while recognizing the importance of the physical, psychosocial, and spiritual aspects of the individual. The role of the nurse in this model is to serve by caring, connecting, and empowering the patient. The ITLC program for nurses with obesity adheres to the Adventist Framework through its focus on providing participant-centered care within the context of social relationships with the goal of empowering positive lifestyle choices.

Beyond the scope of the Doctor of Nursing Practice candidate as a caring change agent within the Adventist Framework, it is important to consider the fundamental concept of encouraging nurses to care for themselves. Nurses must attend to their own self-care so they can best care for others. Nursing Code of Ethics Provision Five reads, “The nurse owes the same duties to self as to others, including the responsibility to promote health and safety, preserve wholeness of character and integrity, maintain competence, and continue personal and professional growth” (American Nurses Association, 2001, p. 7). This ITLC program served to provide an opportunity for education and support for nurses and to empower them to attend to their self-care using a Lifestyle Medicine approach. Qualitative data suggested the participants felt a sense of connection within the small groups which, in turn, empowered them to make the constructive lifestyle changes to reduce obesity.

## Observations

### Noteworthy Findings

The qualitative analysis revealed several interesting findings. First, most of the program participants were already dieting and exercising for weight loss. This is interesting because despite their attention and increased knowledge of health as nursing professionals, they were still having difficulty losing weight. This is believed to be due to the lack of education regarding whole-food plant-based diets for chronic disease reversal as well as the neuroscience of weight management. This program sought to fill in these educational gaps.

Another interesting finding was that several of the participants mentioned that their sleep was improved as a result of the program. While one session was held regarding the topic of sleep, it was not the primary focus of the program and yet improved for many of the participants.

Most of these results seemed to be not because of improved sleep habits but due to the weight loss itself and had occurred after several months of sustained weight loss.

**Key Project Takeaways**

The Project Leader has studied Lifestyle Medicine since 2012 and has learned of its powerful positive health impacts firsthand. This learning process intensified in 2018 in conjunction with Doctor of Nursing Practice coursework with an emphasis in Lifestyle Medicine. The ongoing challenge for the Project Leader, however, is translating this knowledge into meaningful clinical practice. The business, Be Free Lifestyle Medicine, was started to serve as a point of delivery for teaching the positive impacts of Lifestyle Medicine. This scholarly project was designed to investigate whether an ITLC program could be delivered successfully using this business model.

Results suggest the ITLC program can produce statistically significant weight loss in the eight-week program in the Combined Group. And, while there was a small sample size for the Pure Group and results were not statistically significant, participants were able to lose >5% of body weight- the benchmark for successful weight loss. This finding is reassuring, but cannot be considered clinically significant until results have been maintained for 12 months. Thus, the ITLC program has promise as a structured lifestyle intervention program for weight loss, which is one of the clinical practice guidelines that should be made available to all patients who are overweight or obese (Garvey et al., 2016).

More specifically for nurses with obesity, the qualitative strand of this project revealed that nurses who participated liked the small group setting but would have preferred in-person meetings. This program was initially intended to be delivered in-person and this continues to be

the preferred method. The pilot program, however, did show the use of the online meeting room, while not ideal, is a viable option for program delivery.

The qualitative data indicated nurses liked connecting with coworkers, which may support ITLC programs at work as an ideal option. In addition, the qualitative data obtained from this project contributes to an overall understanding of the end-user's perspective and allows for the development of a more patient-centered approach to Lifestyle Medicine at the clinical site. Many of the qualitative themes identified throughout the project can be used as teaching points in future programs (e.g., helping participants plan how to dialogue with friends and family members when implementing lifestyle changes).

The pilot ITLC program also identified two key areas for improvement if this program continues at Be Free Lifestyle Medicine: recruitment and sustainability. Recruitment of participants was more difficult than expected and took longer than expected. Of the participants that were interested, more than anticipated did not meet eligibility guidelines. It is possible that the eligibility guidelines were too restrictive. For example, it may have been unnecessary to have a residency requirement in Washington and Oregon. The protocol called for the Project Leader to do the initial evaluation and the initial lab work. It is possible that an in-person evaluation may not have been necessary, and that lab work could have been obtained by participants at a local lab and submitted prior to the intervention (as is done in other programs such as CHIP). This, however, does raise concerns as to whether this type of provider-led program is legal outside of the states in which the provider is licensed. Other online programs that offer educational programs not taught by providers are not bound by these jurisdictional confines, but further investigation could reveal expansion opportunities.

In addition, because this pilot program was offered at no cost to participants and had no funding outside of the Project Leader's personal funds, it is unclear how this program could continue without some form of outside funding. The Project Leader must explore opportunities to partner with other healthcare entities to bring this program to nurses in an affordable and sustainable manner for both participants and the clinical site.

**Analysis of Project Instruments**

The post-session and post-program surveys did not perform as expected (see Appendix D and E). First, the Project Leader had not used Survey Monkey so there was a learning curve involved in using the program. Then, during the program there were changes made within Survey Monkey that would have required a subscription to continue to send out the surveys by email as they had been in the beginning of the program, so a link had to be sent instead. Aside from the issues with the survey platform itself, there were also very few responses to the surveys and the results did not reveal any particularly useful information. This resulted in having to perform the in-depth interviews to obtain more detailed information about the participants' experiences of the program.

The Interview Guide was another instrument that did not perform as well as initially hoped (see Appendix A). It was initially designed to capture the lived experience of the program participants. While it did serve to capture very useful information regarding the participants and what they thought about the program, it did not fully encapsulate the essence of what it was like to be a nurse with obesity or what it was like for participants to experience the program.

**Interpretation of Outcomes**

While project results were promising, the small sample size of the Pure Group contributed to the lack of statistical significance among the quantitative findings. As the main

purpose of this project was for program evaluation, the testing of the intervention hypotheses and the statistical tests done in this pilot project should be interpreted with caution (Polit & Beck, 2017). Due to the small sample size of the pilot program, the study was underpowered to produce a reliable effect size estimate as planned in Phase One, Objective Four. The small sample size also limits the generalizability of these results. Though results are inconclusive regarding the broad replicability and overall efficacy of the ITLC program, this scholarly project builds upon the existing body of knowledge regarding Lifestyle Medicine best-practices and the overall importance of self-care among nurses. Qualitative data support the promising quantitative findings and suggest participants' overall satisfaction with the ITLC program, as well as its usefulness within their lives. Additional longitudinal data among current participants, in addition to future program iterations involving a larger participant group may yield more conclusive results in the future. Despite the lack of conclusive findings, the clinical significance and the positive impacts of the project upon current participants' lives stand as key indicators for overall program efficacy.

## Limitations

### Limitations of Sampling

Because the sample was obtained using the snowball method across the Project Leader's social networks, both the size and composition of the sample were limited. This resulted in participants who all had similar demographics and characteristics, thus introducing potential bias. This reality limits any generalizability to individuals with differing demographics, including those of different racial and cultural backgrounds.

In hindsight, it would have been beneficial to have expanded the pool of potential program participants. One way to have done this, which was initially intended, would have been

to partner with one of the local healthcare systems to work together to deliver the program to employees. This was not believed to be a viable option when the local hospital systems were running under emergency operation status due to the COVID-19 pandemic in 2020, but it is hoped that future opportunities for collaboration will become available.

**Limitations of Instruments**

Because of the limited results of the Survey Monkey responses, very little program feedback was obtained quantitatively. The qualitative strand of the study was required to obtain more detailed information and further insight into the experiences of the program participants. This involved a complete redesign of the project. Because this strand of the study emerged toward the end of the project, it was also not completed with the scientific rigor initially expected at the start of the project.

The qualitative strand intended to use a phenomenological approach to obtain the lived experience of nurses going through the program; however, due to the Project Leader's inexperience with the phenomenological approach, the interview guide that was developed did not elicit the desired insights. The information obtained did, however, offer clinically relevant information that was better understood using the interpretive description model.

For future qualitative studies, it is recommended that interviews be recorded and that more than one coder be used to enhance the validity of the data collected.

**Limitations of Personnel and Resources**

The Project Leader administered the ITLC program exclusively and was thus limited in financial resources and time. An ITLC program is usually implemented using a team approach. For example, the Ornish Programs include nurses, nutritionists, exercise physiologists, and psychologists (Rippe et al., 2017). There were limited resources for program development and

materials. This is not believed to be a sustainable model of program delivery and alternate sources of funding will need to be explored if the program continues.

## Implications for Future Research

### Suggested Practice Improvements

Future ITLC program administration must include a sustainable way to recruit participants across various demographics. The homogeneity of this pilot program is concerning as it does not reflect the heterogeneity of the nursing population. The local population is about 64% Caucasian, 10% Hispanic, 9% Asian, and 4% African American (Data USA, n.d.). Efforts should be made to continue to promote cultural diversity in terms of program development and distribution. This is especially important because it is well understood that racial and ethnic minorities are disproportionately affected by chronic diseases such as diabetes (Hill-Briggs et al., 2021).

Further investigation as to the legality of remote participation where participants obtain their own baseline testing should also be explored. In addition, forming outside partnerships with local healthcare institutions can serve a threefold purpose: securing additional funding and personnel resources, as well as building healthy lifestyle networks for the betterment of the regional nursing population. Because program participants liked being able to meet in in-person small groups with co-workers, on-site programs could be beneficial. Furthermore, as healthcare costs rise it is becoming increasingly apparent that improving the health of employees also improves the fiscal health of organizations (Baicker et al., 2010).

### Recommended Improvements for Future Program Design

The results obtained during this study can be immediately incorporated into practice by making changes to the ITLC program. The ability to take evidence and incorporate it into clinical

practice is one of the necessary skills of the Doctor of Nursing Practice-prepared nurse and is one of the end-of-program learning objectives for Southern Adventist School of Nursing (see Appendix F). Knowing that program participants often begin the ITLC program in the midst of on-going diet and exercise changes, the program must seek to differentiate approaches so as to encourage those who are just beginning their weight loss journey and support those who have already made positive changes, thus providing an authentic opportunity for future growth and success.

In addition, changes should be made to anticipate and address common obstacles to participant engagement. High stress and fatigue are realities of life for nurses. Additional information and discussion on the ways to incorporate healthy lifestyle changes into busy lifestyles can be incorporated into the program. The program should also address the effect that lifestyle changes have on family and friends. Preparing participants to anticipate these changes may also help to reduce potential obstacles.

In terms of structural design changes, the addition of an optional meal plan may quell initial participant anxieties regarding what and how much to eat. It could be helpful to have a protocol including a nutrition prescription with specific dietary guidance. Other program materials including specific instruction regarding shopping, meal preparation, and recipe ideas would also be useful additions to the program. Moreover, clear directions should be provided in the beginning that instruct participants not to reduce, eliminate, or otherwise change medications without consulting their health care provider.

### *Additional Knowledge or Practice Application Needed*

The main challenge of Lifestyle Medicine practices is that the current healthcare reimbursement structure is designed to support the quick fix approach of pills and procedures in

a fee-for-service model. While the Lifestyle Medicine approach is effective, these services are relatively time intensive and reimbursement for Lifestyle Medicine programs is limited. In a survey of Lifestyle Medicine providers, 57% did not receive reimbursement for their services demonstrating the need for improved models for sustainable delivery of Lifestyle Medicine services (Jensen et al., 2019).

### *Additional Opportunities for Future Scientific Inquiry*

A full-fledged phenomenological study of the lived experiences of nurses with obesity may also reveal insights to inform best practices for self-care and overall nurse health. The more that is known about this experience, the better equipped healthcare professionals will be to prevent and treat this reversible chronic disease among nurses.

Future research is also necessary to ascertain best-practice methodologies for translating the knowledge of Lifestyle Medicine into effective clinical practice. There is abundant research in Lifestyle Medicine literature illustrating the effectiveness of this approach in treating chronic illness and yet, its use in clinical practice is minimal. Further research is needed to determine how to best implement lifestyle interventions, such as ITLC programs, in the treatment of common chronic illnesses.

## Implications for Nursing Practice, Health Policy, and Education

Nurses, as advocates for health, must learn to take care of their own health first. The Project Leader's lived experience and utilization of the ITLC approach to lose and keep off all excess weight over a prolonged period of time helps demonstrate this reality and its life-changing implications. This nurse-practitioner led ITLC program is an evidence-based program to help nurses to take good care of themselves. As a result, the project adds to the evidence base of available literature in support of Lifestyle Medicine approaches to chronic illnesses.

Concerning education, further training in Lifestyle Medicine and support with ITLC programs is needed to help nurses with obesity to lose excess weight and to keep it off. Healthcare professionals must advocate for Lifestyle Medicine and establish ways to make ITLC programs available to nurses, preferably at their workplaces. In addition, offering ITLC programs in nursing schools could also be useful in helping nurses to learn good weight management practices early in their careers.

## Conclusion

Nurses experience obesity at levels equal to that of other working professionals and need ITLC programs that provide education and support to help them achieve their weight loss goals. The purpose of this project was to evaluate the effectiveness of a nurse-practitioner-led online ITLC program that used an evidence-based Lifestyle Medicine approach for the treatment of obesity in nurses. The program evaluation used an emergent explanatory three-phase mixed methods design (QUAN→ quan → qual) to determine its effectiveness. The primary intent of the investigation was to pilot an eight-week ITLC program to improve BMI in obese nurses. Due to the small number of participants, the testing of the hypothesis that the ITLC program would produce statistically significant weight loss and other biometric changes was not achieved. However, by combining the results of three programs run in 2020, it was shown that the ITLC program could produce statistically significant weight loss in eight weeks. The qualitative strand also added valuable information that helped explain results within the context of the Nola Pender Health Promotion Model and the Adventist Framework for Nursing. This scholarly project suggests promising positive health outcomes for nurses with obesity through Lifestyle Medicine ITLC programs. These initiatives provide nurses on the frontlines of healthcare delivery an opportunity to improve their health, thus allowing them to better care for others.

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## Appendix A: Semi-Structured Interview Guide

## for Intensive Therapeutic Lifestyle Change Program for Nurses with Obesity

I would like to know what your lifestyle was like before, during, and after participating in the ITLC program. This can include your diet, physical activity, stress, sleep, and social connection.

1. Tell me about your lifestyle behaviors before participating in the ITLC program.
    - What was your diet like?
    - How much physical activity were you doing?
    - What were you doing for stress management?
    - How much sleep were you getting?
    - How much social support did you have?
    - Describe a typical day.

2. Now, I would like you to share your experience while starting the program.
    - How did you hear about the program and what piqued your interest in joining?
    - What was your experience of the initial evaluation?
    - What was your response to seeing your initial measurements and lab values?
    - How did you feel about the prospect of participating in the program?
    - How confident were you that this program would help you achieve your health goals?
    - What were your initial feelings and reactions?

3. What was your experience during the program?
    - What was your experience of participating in either in-person or online Zoom meetings?
    - Please elaborate on what it was like to participate in a small group.
    - Describe any obstacles or barriers you encountered during the program?
    - What impact did participation in the program have on your family members?

4. Now I would like to know more about your experience following the program. What was your response to seeing your follow-up measurements and labs? How did you feel?
    - How has your lifestyle changed since taking the program?
    - What lifestyle changes did you make?
        i. What is your diet like now?
        ii. How much physical activity are you doing?
        iii. What are you doing for stress management?
        iv. How much sleep are you getting?
        v. How much social support do you have?
        vi. Describe a typical day now.
    - How do you feel about any changes you have made?

- How confident that you will be able to sustain the changes that you made?
- What do you think might help you to develop and maintain healthy lifestyle changes?

5. Describe your experience with the field of Lifestyle Medicine.
    - Had you had any previous experience with Lifestyle Medicine?
    - What is your opinion of Lifestyle Medicine after experiencing the program?

6. If you chose to stop attending the program at any point,
    - what led to that decision?
    - Was there anything the facilitator could have said or done to keep you engaged in the program?

**(Sample:** Participants of Be Free Lifestyle Medicine ITLC Programs)

# Appendix B: IRB Approval Letter

SOUTHERN ADVENTIST UNIVERSITY
Power for Mind & Soul

IRB
Institutional Review Board

September 30, 2020

**Principal Investigator:** Theresa Free
**Research Project:** Pilot Program to Design an Online Intensive Therapeutic Lifestyle Change Program for Nurses with Obesity
**IRB Tracking Number:** 2020-2021-007

Dear Theresa,

It is a delight to inform you that your research protocol titled "Pilot Program to Design an Online Intensive Therapeutic Lifestyle Change Program for Nurses with Obesity" has been approved by the Southern Adventist University Institutional Research Board according to the proposal. You are now authorized to proceed with the project as outlined. This approval expires May 31, 2021.

As a principal researcher, you have the ultimate responsibility for the conduct of the study, adherence to ethical standards, and protection of the rights and welfare of human participants. As you proceed with your research, you are expected to:

1) Conduct the study according to the approved protocol.
2) Make no changes to the approved study. If changes are necessary, proceed with one of the following:
   a) For minor changes to this protocol, please notify IRB by submitting an IRB Form B and proceed after its approval.
   b) For substantial changes, submit a new IRB Form A and proceed after its approval.
3) Use the approved procedure and forms for obtaining informed consent and data.
4) Promptly report any significant adverse events to the IRB within five working days of occurrence using an Adverse Report Form.

All forms must be submitted to irb@southern.edu.

We wish you many blessings as you move forward with this study and look forward to reading your findings when they are ready. If there is anything else we can do to assist you with this research study, please contact us.

Always in His service,

Cynthia M. Gettys, PhD

**Director, Center for Teaching Excellence and Biblical Foundations of Faith and Learning**
**Chair, Institutional Review Board**
Southern Adventist University

**office.** 423.236.2285
**cell.** 423.227.2352
**address.** PO Box 370, Collegedale, TN 37315

"I will instruct you and teach you in the way you should go; I will counsel and watch over you." Psalm 32:8

**Responsibility – Input – Strategic – Learner – Achiever**

"I applied my mind to **study** and to explore by wisdom all that is done under the heavens..." - Ecclesiastes 2:13
"Research is to see what everyone else has seen and to think what nobody else has thought." - Albert Szent-Gyorgyi

## Appendix C: IRB Approval for Research Project Modification

# RE: Research Project Modification

irb

Wed 1/20/2021 8:44 AM

To: Theresa Free <tfree@southern.edu>;

Cc: Frances Johnson <francesj@southern.edu>; f <carolyndavanzo@aol.com>;

Good morning Theresa and Dr's. Johnson & D'Avanzo,

Thank you so much for submitting an IRB FORM B for this research project. Your request is approved. Should you need to make any additional changes please submit a second IRB FORM B.

Best wishes as you proceed with your scholarly research project.

Always in His service,

*Cynthia M. Gettys, PhD*

***Director**, Center for Teaching Excellence and Biblical foundation of Faith and Learning*
***Chair**, Institutional Review Board*

*Southern Adventist University*

*Office:* 423.236.2285
*Cell:* 423.227.2352
*Email:* cgettys@southern.edu
*URL:* www.southern.edu/cte
*Mailing:* PO Box 370, Collegedale, TN 37315

*Responsiblity - Input - Strategic - Learner - Achiever*

## Appendix D: End of Session Survey*

1. Overall, how would you rate the class?

    a. Excellent
    b. Very good
    c. Good
    d. Fair
    e. Poor

2. What did you like about the class?

3. What did you dislike about the class?

4. How organized was the class?
    a. Extremely organized
    b. Very organized
    c. Somewhat organized
    d. Not so organized
    e. Not at all organized

5. Was there any information that would have been helpful to have before the class?

6. How would you rate the value of the class?
    a. Excellent
    b. Above Average
    c. Average
    d. Below average
    e. Poor

7. Overall, how satisfied or dissatisfied are you with the program?
    a. Very satisfied
    b. Satisfied
    c. Neither satisfied nor dissatisfied
    d. Dissatisfied
    e. Very dissatisfied

8. What improvements would you make to this class?

**Sent following each session using Survey Monkey.*

## Appendix E: End of Program Survey*

1. Overall, how would you rate the program?
    a. Excellent
    b. Very good
    c. Good
    d. Fair
    e. Poor

2. What did you like about the program?

3. What did you dislike about the program?

4. How organized was the program?
    a. Extremely organized
    b. Very organized
    c. Somewhat organized
    d. Not so organized
    e. Not at all organized

5. Was there any information that would have been helpful to have before the program?

6. Was the class length too long, too short, or about right?

7. Was the program length too long, too short, or about right?

8. How would you rate the value of the program?
    a. Excellent
    b. Above Average
    c. Average
    d. Below average
    e. Poor

9. Overall, how satisfied or dissatisfied are you with the program?
    a. Very satisfied
    b. Satisfied
    c. Neither satisfied nor dissatisfied
    d. Dissatisfied
    e. Very dissatisfied

10. What improvements would you make to this program?

**Sent at the conclusion of the program using Survey Monkey.*

## Appendix F: End-of-Program Student Learning Outcomes (EOP SLO) Synthesis

Southern Adventist University
School of Nursing
DNP Scholarly Project EOP SLO Synthesis

**PICO/Research Question:**

How does evaluation of quantitative biometric data and qualitative data regarding individual experiences combine to provide improved understanding of the effectiveness of an online eight-week, nurse practitioner-led Lifestyle Medicine Intensive Therapeutic Lifestyle Change Program (ITLC) for weight loss for nurses who are overweight or obese?

1. ***Cultural Competence:***
   *Mentor Christian responsiveness and caring to a global culture through sensitivity and competence for patient traditions and values*

   This Scholarly Project (SP) allowed for the demonstration of cultural competence as it enhanced learning regarding obesity, which is worldwide pandemic and affects persons from all cultural backgrounds. The Intensive Therapeutic Lifestyle Change (ITLC program) was tailored specifically to the culture of nurses. As obesity and nursing are multi-cultural, this SP incorporated elements of cultural diversity throughout the process. One example of this was to include healthy food options from various ethnic cuisines. This SP allowed the opportunity to show competence and sensitivity for individuals within the culture of nursing, which has unique traditions and values.

2. ***Evidence-Based Practice:***
   *Translate quality research findings and outcomes to solve problems for quality personalized outcomes.*

   This Scholarly project demonstrated evidence-based practice (EBP) by providing a thorough understanding of the literature on the issue of obesity in nursing and the treatment of obesity using a Lifestyle Medicine approach. It took what was known about obesity and its treatment and applied that knowledge directly to a clinical setting and translated the knowledge into clinical practice. The results also produced additional knowledge that can be immediately incorporated into the next iteration of this program further enhancing this evidence-based practice.

3. ***Health Promotion:***
   *Propose evidence-based methods that prevent disease and promote human flourishing through the utilization of a holistic framework to educate and empower healthy lifestyle choices.*

   This Scholarly Project was ideal for demonstrating health promotion. The purpose of studying obesity in nurses is for health promotion in this population. In helping nurses to learn to make lifestyle changes they are also much more likely to spread this teaching out to the community in which they work. Thus, health promotion efforts affect, first, the targeted population, but then are also expanded via the nurses' influence in the healthcare community.

4. ***Patient-Centered Care:***
   *Facilitate inter/intra professional healthcare to achieve personalized, compassionate, and coordinated whole-person care.*

   This Scholarly Project demonstrated patient-centered care through its small group design. This design allowed for individual attention for each participant. This program also allowed for individualization of each person's Lifestyle Medicine weight loss plan using weekly specific, measurable, actionable, realistic, and time-bound (SMART) goals.

5. ***Quality and Safety:***
   *Evaluate current evidence and outcomes of practice in health care systems to ensure a just culture that minimizes the risk of harm and promotes safety and quality of care.*

   As with any medical intervention, there are always potential side effects. Even with something that is generally considered healthy to do, it is not without some potential side effects. This SP included a thorough review of current evidence and outcomes of practice to ensure that the risk of harm was minimized, and that quality and safety were promoted. One of the great benefits of Lifestyle Medicine is that the risks of side effects are very minimal compared to traditional pharmaceuticals and procedures. They also tend to have many more positive beneficial effects in addition to the desired outcomes. This project sought to maximize benefits and provide quality care while minimizing risks. The study required that participants undergo a physical biometric assessment and fasting blood draw pre- and post-intervention. There was also a minor risk for anxiety, sadness, or emotional distress that can be experienced when participating in a small group setting. The risk did not exceed the risk of harm one would experience during a routine clinical intervention or that normally encountered in everyday life. The potential benefits of weight loss from participating in the program were believed to outweigh the minor risks involved in participating in this eight-week online program. Appropriate measures were also taken to protect privacy and confidentiality and all protected health information (PHI) was handled in accordance with Health Insurance Portability and Accountability Act (HIPAA) guidelines.

6. ***Informatics and Innovation:***
   *Analyze healthcare outcomes using knowledge of nursing, computer and information sciences to ethically and innovatively manage data, information, and technology.*

   The ITLC program was originally designed to be delivered in a small group, in-person setting, but due to the COVID-19 pandemic was delivered online in an online meeting room. This transition allowed this DNP student to use the technology available to deliver the program in an online format that allowed nurses to participate from the comfort and safety of their own homes. The project also required using informatics in terms of managing data in the electronic medical record as well as analyzing data through statistical software programs.

7. ***Teamwork and Collaboration:***
   *Organize effective inter/intra professional teams to promote quality health outcomes and reduce risk.*

   This Scholarly Project required a team effort for successful completion and allowed demonstration of the ability to effectively work within teams and collaborate. The primary teamwork and collaboration required for this project was with SAU faculty and colleagues to navigate through the class and the project successfully. Teamwork and collaboration were also required within the ITLC program as making lifestyle changes also requires teamwork. The small group setting fostered a collegial spirit among the participants. The other, very important, team members are my family who provided support throughout the process.

8. ***Professionalism:***
   *Advocate for Christ-centered excellence in nursing roles and professional behaviors throughout the inter/intra professional team.*

   This SP required working professionally with both the members of the DNP faculty as well as the participants who are also professional nurses. Working professionally with a healthcare team of nurses to create a program for nurses was an excellent opportunity to demonstrate professionalism. This project was also delivered within the context of a small business setting. Being a small business owner and developing this program to be delivered as a service has also added an additional element of professionalism to this project.